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THE CHALLENGES OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC

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Abstract

Abstract: Era Society 5.0 is characterized by the application of digital technology to various human activities. The Covid-19 pandemic requires almost all human activity to shift to digital media, including education services. Now, education services must adapt to online learning methods. This change is a challenge for Indonesian education which must also prepare students to adapt to face the challenges of the era of Society 5.0. This study aimed to obtain information about online learning during the study from home during the Covid-19 pandemic at the junior, senior, vocational, and university levels in Indonesia. Researchers also analysed the differences in the mastery of learning technology in students and educators. This study used a questionnaire distributed via Google forms to students and educators using Facebook, e-mail and WhatsApp Group (WAG). The total sample in this study were 108 educators and 386 students. From the independent sample t-test test, the following results were obtained: 1) the mastery ability of MS office software and online learning technology in students was higher than students with significant differences; 2) There was no significant difference between teacher and lecturer perceptions regarding the role of learning technology in the classroom and on the educational process of students. The success of online learning was highly dependent on several integrated components, such as students, educators, learning resources, and the technology used. The researcher also found several disadvantages of online learning, such as student discipline, lack of internet access, and lack of social interaction which are a common challenge for educational organizations and stakeholders. The technology was created to complement and assist humans in carrying out their duties and responsibilities, not to replace the role of humans as a whole.

Keywords: technology; covid-19; online learning

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Introduction

Human technology is increasingly developing over time. Technology can have a positive impact, depending on how humans minimize existing risks and take advantage of opportunities that arise from the development of these technologies (De Leon et al., 2020). The era of the industrial revolution 4.0 is an era where information technology is developing rapidly and colours every human life, one of which is in the field of education (Nastiti & Abdu, 2020). This development makes a new face in the phase of technological progress. Although the hustle and bustle of the industrial revolution 4.0 era are still ongoing, Indonesia is now shocked by the new concept of society 5.0. Society era Society 5.0 focused all its activities on the application of digital technology. Now, with the Covid-19 pandemic affecting the whole world, the concept of Society 5.0 must be applied, where almost all human activities use digital media.

Corona Virus Disease or better known as Covid-19, is a new type of coronavirus that attacks the human respiratory system. The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei Province, and has since spread globally throughout the world without exception. This condition affects every sector of human life very quickly. The

Covid-19 pandemic has caused unprecedented damage to the education system throughout the world. In addition to measurable economic impacts in the short and long term, there is an intangible collapse in educational institutions. In particular, educators, the most critical intellectual resources of any educational organization, must face various types of difficulties, including financial, physical, and mental because of COVID-19.

To reduce the number of people with Covid-19, the Minister of Education and Culture issued a circular on March 24, 2020, which regulates the implementation of education during the emergency spread of Covid-19, as is also done by many countries. Provincial and local governments issued policies to temporarily eliminate face-to-face learning which was replaced by 'study from home' through online or online learning. This policy applies at the elementary, secondary and university level. This step is considered appropriate to prevent the spread of Covid-19 in the school or campus environment, although a limited initial survey conducted by some researchers showed that implementation in the field is still diverse. Online learning can be an effective solution for activating classrooms even though schools or universities have been closed given the enormous risks during this pandemic (Herliandry et al., 2020). Besides, the ability to master technology by educators would be increasingly encouraged to become better with online learning (Miaty, 2020).

Some regions in Indonesia protect all citizens, including students, by applying study from home. With this policy, students go through the learning process from home. Therefore, all elements of the education ecosystem must adapt to online learning methods, although in practice, they must face several obstacles. Among these constraints are the limited ownership of computers or laptops and internet access. Both of these are the main problems that cause uneven access to online learning. Similar facts were also found in developed countries such as in the United States, the United Kingdom, and Singapore (Almi, 2020).

Learning is a process that is built to develop students' creative thinking (Widodo & Kadarwati, 2013). Meanwhile, the term '*daring*' is an abbreviation of '*dalam jaringan*,' which is the Indonesian substitute of the word 'online' that is often related to internet technology. Learning process, whether using learning applications or social networking, is called online learning (Amongguru.com, 2020). According to Basilaia & Kvavadze, (2020), online learning is the experience of knowledge transfer using video, audio, images, text communication, and software supported by internet networks (Zhu & Liu, 2020). The essential factor in online learning is the readiness of educators and students to interact online.

In the field of education, the era of society 5.0 allows students to directly interact with robots specifically designed to replace educators or be remotely controlled by educators in the learning process (Elsy, 2020; Nastiti & Abdu, 2020). Current technological developments enable online learning to be implemented well. The technology adopted in education today has led to a variety of new learning models. Some of these models are learning with the help of electronic devices (e-learning), such as Compact Discs which contain material to be studied and distributed by post; distance learning (distance learning); and also online learning, where learning material/media is placed on a server that can be accessed via the Internet. According to Gikas & Grant, (2013), the implementation of online learning requires the supported of mobile devices such as smartphones, tablets and laptops that can be used to access information anywhere and anytime. Abidah et al., (2020) discussed various infrastructures that supported online learning for free, simple, and could be accessed using smartphones, namely various discussion rooms such as Google Classroom, WhatsApp, *Kelas Cerdas*, *Zenius*, *Quipper*, and *Microsoft*. Online learning could even be done through social media, such as Facebook and Instagram (Kumar & Nanda, 2018).

The Work from Home (WFH) and Study from Home (SFH) conditions had forced all parties to maximize the learning process. This requires optimizing the role of digital technology in educational services, where educators and students are expected to be adaptive and utilize technology quickly. Educational organizations are faced with new technologies in the form of e-learning technologies that are expected to increase flexibility for students and improve learning outcomes. Covid-19 pandemic provides positive learning from the technology side. In a short time, the use of online learning technology can increase the absorption of technology in education in Indonesia. Online learning is a form of learning method which is perceived to be student-centred. Therefore, the use of e-learning is expected to motivate improvement in the quality of learning and teaching materials, the quality of student activity and independence, and communication between lecturers and students and among students (Hayati, 2020).

The results of Dewi, (2020), showed that the implementation of online learning in elementary schools during the Covid-19 pandemic could be carried out quite well because of the collaboration between teachers, students and parents in learning at home. Furthermore, the results of (Purwanto et al., 2020) studies that used 15 respondents consisting of teachers and parents in two elementary schools in Tangerang Indonesia, showed several challenges and obstacles experienced by students, teachers, and parents in online learning. These challenges included limited communication related to socialization among students, challenges for students with special educational needs, and more extended screen time. On the other hand, parents thought that problems that arise were more related to the lack of discipline of learning at home, much time spent by parents to help children's learning at home (especially for children under Grade 4 in Primary Schools), lack of technical skills and higher internet bills. The results of Putria et al., (2020) found that there were several supporting factors for educators in the online learning process, namely the availability of smartphones, quotas and a stable internet network because not all students have smartphones. The results of Zhang et al., (2020) research on online learning in several schools and universities in China during the Covid-19 pandemic showed ambiguity and disagreement about what to teach, how to teach, the workload of teachers and students, the environment teaching, and its implications for equitable education. Good relational coordination between teachers in e-learning is needed, such as the provision of routine and timely communication mechanisms, and problem-solving to supported shared knowledge in the context of shared goals. In addition, mutual respect could lead to higher job satisfaction of teachers (Margalina et al., 2014).

The success of online learning systems is highly dependent on several integrated components between students, lecturers, learning resources, and existing technology (Mustofa et al., 2019). The results of Firman & Rahayu, (2020) showed that: (1) students already had the essential facilities needed to take part in online learning; (2) online learning was flexible in its implementation and able to encourage the emergence of learning independence and motivation to be more active in learning; (3) distance learning encouraged the emergence of social distancing behaviour and minimized the emergence of crowds to reduce the potential for the spread of Covid-19 in the campus environment. Zhafira et al., (2020) in a study of 165 students of the Faculty of Economics, Teuku Umar University who were involved in online learning during the Covid-19 quarantine period, proved that the most popular online learning media were WhatsApp and Google Classroom. As many as 53% of respondents were familiar with a variety of online learning media before online lectures began. Furthermore, the most popular communication pattern was the semi-two-way pattern, so that further research was needed on online learning research with problem-based, collaborative, and other models.

The purpose of this study was to develop previous research on learning practices during Covid-19, to get information related to the implementation of online learning during SFH in several junior high schools (junior high schools), high school/vocational schools (SMA/K), and several universities (PT) in Indonesia, learning technology used by students, students, teachers and lecturers, mastery skills of MS office software and learning technology from students and students, teachers and lecturers. Another purpose of this study was to analyse the differences in the mastery of MS Office software and learning technology in students and students as well as differences in the perception of teachers and lecturers about the role of learning technology devices in the classroom on student learning.

Covid-19 has an impact on the provision of educational services (Sintema, 2020). To supported educational services using online learning methods, students and educators are required to master a variety of software such as Microsoft Office (Word, Excel, PowerPoint) or similar. This software is essential for students in doing the tasks given by educators. Djaja (2016) believed that teachers consist of three learning modalities, including face-to-face, online, and online combinations. Djaja also conducted empirical studies on teachers and found several obstacles, including (a) Limited time of teachers (limited time), (b) Inadequate facilities and infrastructure (lack of space, weak internet network), (c) teacher's low mastery in technology. In the implementation of distance learning during the Covid-19 pandemic, there were still many teachers who only give assignments to students in the form of questions, summaries, and the like (Arika, 2020; Miaty, 2020).

For schools and universities that already have online learning applications, the adaptation process is easier than schools or universities that do not have the application. According to an empirical study before the pandemic conducted by Basri et al., (2018), with 1000 respondent students at King Abdulaziz University (KAU), Damam University (DU), Northern Border University (NBU), and Baha University (BAU), it was found that 1) there was a relationship between the Internet and Computer Technology (ICT) adoption and academic performance; 2) adoption of ICT resulted in increased performance in female students which was higher than male students; 3) in the IT department, it was found that ICTs did not have an impact on student academic achievement. Furthermore, most universities have replaced traditional exams with online assessment tools; but for schools, this situation is a new area for teachers and students. Therefore, there is a possibility of measurement error that is greater than normal conditions (Burgess & Sievertsen, 2020).

Anggraini (2018) found that the use of e-learning as a substitute for conventional lectures (non-e-learning) as an effort to improve students' analytical thinking skills on problems in the Introduction to Accounting I subject was ineffective. Thus, e-learning should not be used as a substitute for conventional learning, but rather as a supplement and complement to learning. Khusniyah & Hakim (2019) found differences in the ability of students to understand English texts between before and after the use of web blogs. Furthermore, online learning through a web blog had a positive influence on improving students' English reading skills. Navimipour & Zareie (2015) showed that e-learning systems as measured from the aspects of technology, educational content, motivation, and attitude significantly influence employee learning satisfaction.

Based on the previous description, the hypothesis is formulated as follows:

Hypothesis 1: There is a significant difference between student and student abilities related to Microsoft Office software and learning technology.

Hypothesis 2: There is a significant difference between the perception of teachers and lecturers regarding the role of learning technology in the classroom concerning the students' educational process.

Materials and Methods

This research was an exploratory case study to obtain information about the consequences of the Covid-19 pandemic on online learning and teaching in junior high schools, high schools, vocational schools, and universities. The population in this study were junior high school students and high school students, vocational high school students; university students, teachers, and lecturers in Indonesia. Considering that the population was substantial, to get a research sample, the distribution of questionnaires was carried out by random sampling using the Google form application. This questionnaire was distributed to teachers, lecturers, students, and university students through Facebook, messenger, e-mail, and WhatsApp Group (WAG). The link address for the lecturer questionnaire was <http://forms.gle/2YznWZ3&rvtatwowUA>; the address of the student questionnaire link was <https://forms.gle/FxWTbBnRPzzZgts9A>, the address of the teacher questionnaire link was <http://forms.gle/yunmuQzXXzQ4e1Xe7>; the link address for the student questionnaire was <https://forms.gle/EkEsD5uNDG4N8a98>. The analysis technique used was descriptive and comparative analysis to analyse differences in Microsoft Office mastery and online learning technology between students and students and differences in teacher and lecturer perceptions regarding the role of learning technology in the educational process. Meanwhile, to analyse the differences in the mastery of learning technology between groups of students, an independent samples test was conducted using the IBM SPSS Statistics 22 program.

Results and Discussion

Based on the results of the distribution of questionnaires conducted by the random sampling method via the Google Form application to lecturers, teachers, university students, and students through Facebook, messenger, e-mail, and WhatsApp Group, 52 lecturers and 220 students from several universities were obtained. In addition, researchers also obtained 56 teachers and 166 junior high, high school, and vocational students from various schools in Indonesia. Thus, the total sample in this study were 108 educators and 386 students.

Table 1. Respondent Group Details

Group	Area of School or Universities	Total Respondents
Teachers	East Java : 22 Schools	56
	Central Java : 3 Schools	
	Jakarta : 1 School	
	West Java : 1 School	
	Kalimantan : 4 Schools	
Lecturers	East Java : 9 universities	52
	Central Java : 1 university	
	Yogyakarta : 2 universities	
Total Respondents		108
Students	East Java : 13 Schools	166
	Sumatera : 1 School	
	West Java : 2 Schools	
	Jakarta : 1 Schools	
Students	Jawa Timur : 5 universities	220
Total Respondents		386

Source: Research data (2020)

Descriptive Analysis Assessment Results

Descriptive analysis was intended to provide an overview of the ability of MS Office mastery and learning technology, learning technical tools used, perceptions of educators about the role of learning technology devices in the classroom in learning, and the advantages and disadvantages of study from home Covid-19 pandemic period felt by educators and students. Assessment intervals were as follows.

Table 2. Interval Assessment

Scale interval	Assessment
1,00-1,80	Very low
1,81-2,60	Low
2,61-3,40	Fair
3,41-4,20	High
4,21-5,00	Very high

Table 3. Student skills related to Microsoft Office Software and Learning Technology

A. <i>Dealing with Microsoft Office Software</i>	Average	Annotation
How good were you in creating and editing Microsoft Word files?	3.35	Fair
How good were you in creating and editing Microsoft PowerPoint presentations?	3.20	Fair
How good were you in creating and editing Tables in Microsoft Excel?	2.68	Fair
B. <i>Dealing with technology</i>		
How good were you in mastering the technical learning tools?	3.18	Fair
How good were you in using learning technology available at school/campus?	3.45	High
Average	3.18	Fair

Source: Research data (2020)

Table 4. University Student ability related to MS Software and Learning Technology

A. <i>Dealing with Microsoft Office Software</i>	Average	Annotation
How good were you in creating and editing Microsoft Word files?	3.59	High
How good were you in creating and editing Microsoft PowerPoint presentations?	3.41	High
How good were you in creating and editing Tables in Microsoft Excel?	3.01	Fair
B. <i>Dealing with technology</i>		
How good were you in mastering the technical learning tools?	3.27	Fair
How good were you in using learning technology available at school/campus?	3.21	Fair
Average	3.30	Fair

Source: Research data (2020)

In Table 3, it was evident that the average value of the ability of students who become respondents in mastering MS Office software and technical learning tools was at the Fair level. However, the ability to use learning technology available in schools was at a High level. Meanwhile, Table 4 explained that university student respondents had high ability in mastering Microsoft Word and Microsoft PowerPoint files. However, the ability to create and edit tables in Microsoft Excel was only at the Fair level. Meanwhile, capabilities related to technical learning tools and the use of the technology available on campus were at the Fair level.

When compared, the average ability of university students related to MS office software and learning technology was higher than students. This situation was understandable because the implementation of learning from home during the Covid-19 pandemic was not a normal learning phase, but an emergency period. After all, the environment was being endangered by a dangerous pandemic. To be better prepared for online learning, students

must be healthy, happy, not stressed, and gradually trained to become independent and diligent learners.

Table 5. Students Online Learning Tools During the Covid-19 Pandemic

Tools	Percentage (%)
Smartphone	38,14
Internet networking	32,77
Computer (PC or Laptop)	26,40
Smart Board	1,22
Etc (Book, TV, Module)	1,47
Total	100

Source: Research data (2020)

Table 5 presented various learning tools used by students during the home form study. Researchers found a variety of devices used, 156 students using smartphones and a combination of 108 students using a PC or laptop. The most used infrastructure of 156 students in online learning was the internet network, while the other infrastructure was textbooks and television. This finding was in accordance with [Abidah et al., \(2020\)](#), who found that online learning can use a simple and free application so that students can follow the learning process via smartphones. From the contents of the questionnaire about the impression of online learning, information was obtained that despite the many conveniences provided online learning through the Internet, and students preferred face-to-face learning.

Table 6. University Students Online Learning Tools During the Covid-19 Pandemic

Tools	Percentage (%)
Smartphone	43,60
Computer (PC or Laptop)	42,30
Internet networking	9,50
Smartphone and Laptop	4,60
Total	100

Source: Research data (2020)

Table 6 showed that during SFH, the most widely used learning tools most university students were smartphones and computers (PCs or laptops) with Internet supported. This finding was in line with the findings of [Firman & Rahayu, \(2020\)](#), which revealed that university students already had the essential facilities needed to participate in online learning. Online-based learning in the industrial era 4.0 towards the era of society 5.0 was not difficult because almost all students and educators already had smartphones or other devices to access this online-based learning. Meanwhile, the online media most preferred by students in order, were Google Classroom, WhatsApp Group, YouTube, Instagram, and Zoom ([Mustakim, 2020; Zhafira et al., 2020](#)).

Table 7. Teacher's Perception Related to Learning Technology in the Classroom

Statement items/questions	Average	Annotation
How good were you at using the Internet in the classroom?	3.25	High
What was your impression about the technological tools used in the education process? Does the tool contribute to the interaction and concentration of students in the lesson?	3.53	High
What was your impression about the tools of modern technology used in the education process? Does the tool contribute to students' high grades and student achievement?	3.37	High
Technical people at your school actively contribute to enriching technical tools in the classroom.	3.82	High
The addition of new technological tools in the classroom will have a significant impact on students' motivation and presence in class.	4.19	High
Average	3.63	High

Source: Research data (2020)

In table 7, it can be seen that the internet usage of the teachers when in the classroom was at a High level. The teachers also had a positive impression of the technological tools used in education because they contribute highly to the process of interaction and concentration of students in lessons and students' grades and achievements. The supported of technical staff in schools were also high because they actively contribute to enriching technical learning tools in the classroom. Thus, the addition of new technological tools in the classroom has an impact on increasing student motivation and attendance in class.

Table 8. Teacher Learning Tools in the Classroom

Tools	Percentage (%)
Computer (PC or Laptop)	27,53
Internet networking	21,91
Projector	20,78
Smartphone	17,98
Book, TV, Module	8,99
Smart Board	2,81
Total	100

Source: Research data (2020)

In table 8, it could be seen that most of the learning devices used by teachers in the classroom were Internet-connected PCs or laptops, projectors (LCD), and smartphones.

Table 9. University Students Online Learning Tools During the Covid-19 Pandemic

Tools	Percentage (%)
Smartphone	34.81
Internet networking	34.81
Computer (PC or Laptop)	26.68
LCD, Smart Board, WA, TV	3.70
Total	100

Source: Research data (2020)

In table 9, it was evident that most of the learning tools used by teachers during LFH were smartphones and PCs or laptops that were connected to the Internet. Online learning could take place because there were several supporting factors, including smartphones, quotas, and a stable and good internet network (Putria et al., 2020). Table 9 also showed that Smartphones were a major supporting factor in online learning during SFH.

Table 10. Lecturer Perception related to Learning Technology in Classroom

Statement items/questions	Average	Annotation
How good were you at using the Internet in the classroom?	3.63	High
What was your impression about the technological tools used in the education process? Does the tool contribute to the interaction and concentration of students in the lesson?	3.98	High
What was your impression about the tools of modern technology used in the education process? Does the tool contribute to students' high grades and student achievement?	3.60	High
Technical people at your school actively contribute to enriching technical tools in the classroom.	3.61	High
The addition of new technological tools in the classroom will have an enormous impact on students' motivation and presence in class.	4.11	High
Average	3.78	High

Source: Research data (2020)

In table 10, it could be seen that the internet usage of lecturers during lectures in class was at a high level. In addition, there was a positive impression of the technological tools used in education because they contributed highly to the process of interaction and concentration of students in lectures as well as to students' grades and achievements. [Basri et al., \(2018\)](#) showed that the adoption of ICT (information and communication technology) and student academic performance was positively and significantly related. Technical supported on campus was felt high because they actively contributed to enriching the learning tools in the classroom. Thus, the addition of new technology tools in the classroom could have an impact on increasing student motivation and attendance in class. [Sianturi \(2018\)](#) showed that internet usage on university students could significantly influence the motivation of university students in using e-learning. [Puspitasari et al., \(2018\)](#) found that the use of instructional media significantly influenced the motivation of students. Meanwhile, if online learning with the Edmodo application continued to be done, student achievement would increase, and the teacher would also save time and energy in the learning process ([Sobron et al., 2019](#)).

Table 11. Lecturer Learning Tools in the Classroom

Tools	Percentage (%)
Computer (PC or Laptop)	32,03
Internet networking	24,18
Projector (LCD)	24,18
Smartphone	15,03
Smart board, white board, speaker	4,58
Total	100

Source: Research data (2020)

Table 11 showed that most of the learning devices used by lecturers in the classroom were PCs or laptops that were connected to the Internet, projectors (LCD), and smartphones.

Table 12. Lecturer Learning Tools During LFH

Tools	Percentage (%)
Internet networking	42.30
Computer (PC or Laptop)	34.60
Smartphone	13.50
Computer, smart phone, laptop, internet	9.60
Total	100

Source: Research data (2020)

In table 12, it was evident that most of the learning tools used by lecturers during LFH were PCs or laptops and smartphones connected to the Internet. The development of cheap and easy information and communication technology in the Industrial 4.0 era towards the era of Society 5.0. Had a significant influence on the teaching and learning process because it removes the limitations of space and time which had so far restricted the world of education. Tables 11 and 12 showed that educators use technology tools were supported by easy access to technology to improve the quality of learning.

Advantages and Disadvantages of Online Learning during the Covid-19 Pandemic

Table 13 and table 14 presented a summary of the advantages and disadvantages of implementing online learning during SFH during the Covid-19 pandemic based on the opinions of students, university students (386 respondents), as well as the opinions of teachers and lecturers (108 respondents) from various educational organizations in Indonesia.

Table 13. Summary of the Advantages of Online Learning

No	Advantages of Online Learning
1	Learning activities were more flexible so that the teacher could manage time well. Teachers and students could set their own learning time. Finally, the teacher had plenty of time to prepare teaching material.
2	More discipline in the use of time because learning with internet access requires additional costs.
3	More encouraging students to be more independent.
4	Material and learning outcomes of students Fast and very well documented, so it was very easy to do the task tracking or learning outcomes of students (integrated material, assignments, grades, presence).
5	Online learning through space and time, mentoring students through the Internet, tasks could be completed and done at any time.
6	Better health, avoid Covid-19
7	No need to leave the house (workplace) to go to a place of study, save energy and transportation.
8	Learning could be carried out more varied according to the RPS in the form of learning videos, e-books and quizzes.
9	Educators become more creative, know the use of IT, and familiarize themselves with technological advancements.
10	It was directly proportional to the creativity and digital literacy of lecturers and students
11	More comfortable and relaxed, and students were also more relaxed in learning, students were more eager to work on assignments.
12	Students were more creative in giving arguments and looking for information and were more willing to discuss.
13	The course material must be more detailed because only with writing as the primary explanation and more motivated to make teaching materials.
14	Online learning (study from home) teaches the ethics of learning from home (dress modestly, be as formal as learning on campus and school.
15	Online learning teaches educators to be more patient, flexible, empathic, and anticipatory to all possibilities that could occur during online learning (for example, the internet network suddenly weakens).

Source: Primary data (2020).

Table 13 showed the advantages felt by educators and students by implementing the SFH online learning model. This finding was consistent with the results of previous studies that online learning had flexibility in its implementation and was able to encourage social distancing behaviour, could reduce the potential for the spread of Covid-19 in the campus environment, and eliminate awkward feelings so students could express ideas, opinions and ask questions freely; online learning could provide students with more meaningful learning experiences (Sobron et al., 2019) and provided new experiences more challenging than conventional learning models (Kuntarto, 2017). The results of online learning English studies with complementary media web blogs proved that online learning could improve students' reading skills (Khusniyah & Hakim, 2019).

Table 14. Summary of Online Learning Disadvantages

No	Disadvantages of Online Learning
1	Social activities and interactions were reduced, interaction or socialization with students and co-workers was reduced, and emotional attachment between students and educators was reduced, less satisfied because there were no face-to-face meetings.
2	Less optimal learning because it could not provide a sufficient explanation, lack of student participation, and learning implementation plans were not achieved optimally.
3	The material could not be received clearly by students, so students feel confused, so some questions were given to the teacher repeatedly
4	Less effective if the number of students was more than 40
5	Unstable or unequal internet connections in some places could hamper the learning process
6	Online learning models for specific subjects (calculation, design, and laboratory) were not effective
7	In terms of the learning process lacking quality, students lack an understanding of the material, which impacts the quality of the results.

8	Limitations of students in exploring online lectures caused by the use of the Internet, so students could not actively participate in the whole learning process, and not 100% of students had smartphone devices
9	Learning supported tools were not adequate if, at work, the facilities provided were complete
10	Learners were not yet fully prepared with online learning, the ability of students to capture material was not the same
11	Unable to control students' assignments directly when compared to face to face, this was related to originality
12	Cause fatigue and burnout, especially for students.
13	Honesty and responsibility aspects of students.
14	It was difficult to control the level of learning competency achievement
15	Prefer to study at school/campus, because when SFH, the assignments become more numerous, and communication with educators was less than optimal
16	Learning was only in the form of online assignments, not online schools

Source: Research data (2020)

The results support this result in supporting [Briliannur et al. \(2020\)](#) which shows that there is less effective online learning due to the lack of facilities and infrastructure and unpreparedness of technology education. The results of this study supported the findings of [Bøe \(2018\)](#), which proved that there was no significant relationship between teacher satisfactions to continue using e-learning technology. This is in line with china's national online learning experiments during the Covid-19 pandemic also showed a number of difficulties in their implementation, such as disadvantages in online teaching infrastructure, lack of teacher experience (including unequal learning outcomes caused by diverse teacher experiences), information gaps, environmental difficulties complex at home, lack of discipline, less effective online education processes, and long-term online teaching could have a negative impact on students' mental and physical health ([Zhang et al., 2020](#)). The Covid-19 pandemic situation is a situation where there was a sudden change from a study from school to study from home. It is an emergency, so education practitioners were less able to prepare learning systems and online learning materials maturely and systemically.

In table 14, we saw some of the disadvantages of online learning. According to the participants, they were less motivated, and there was also a significant increase in online assignments. Therefore, most of the student respondents expected more conventional learning models. On the other hand, educators felt fatigued and burnout. To overcome these challenges, educators needed creativity. They should not only place students as 'listeners' or 'viewers', but also encourage their active participation to interact, dialogue, collaborate, share and build knowledge together. If educators could make the learning process more fun, students would be more interested in participating in the learning process ([Mustakim, 2020](#)). [Hikmatiar et al., \(2020\)](#) proved that the use of Google Classroom as a learning medium had a positive impact on improving learning outcomes, interests and motivation of students in learning, and fostering creative attitudes towards students or students. For specific subjects and subjects related to calculation and practice, it was not sufficient if only done through online learning. Mustakim, (2020) argues that in order to increase the effectiveness of online learning, especially in the matter of calculation, it was better for the questions given to be more varied and different for each student. In addition, assignments must be included with an explanation of how to work.

Independent Samples Test

To test the significance of differences in students and university student abilities related to MS office software and learning technology, as well as the significance of differences in teacher and lecturer impressions related to learning technology, an Independent Sample t-Test was conducted. Homogeneity testing using the Levene's Test was done before the difference test. The test results were presented in the following table 15 and 16.

1. Independent Samples Test for Student and Student Groups

Table 15. Homogeneity Test and Independent Samples Test

			Levene's Test for Equality of Variances		t-test for Equality of Means				
			F	Sig.	T	Df	Sig. (2-tailed)	95% Confidence Interval of the Difference	
								Lower	Upper
Learning technology abilities	Equal variances assumed	.056	.812	-2.052	384	.041	-1.27817	-.02730	
	Equal variances not assumed			-2.036	344.520	.043	-1.28335	-.02213	

Source: Research data (2020)

Based on the SPSS output presented in table 15, it was found that the value of Levene/2 Test for Equality of Variances was $0.812 > 0.05$. So, it could be interpreted that the data variance between student groups and student groups was homogeneous or the same, so that the interpretation of output independent samples t-test was guided by the values contained in the Equal variances assumed column. In table 15, it could be seen that the Sig. (2-tailed) at the equal variances assumed was $0.041 < 0.05$. This means that hypothesis 1, namely there was a significant difference between the ability of students and students related to Microsoft office software and learning technology was accepted. This result was supported by the average value of the ability of student groups related to mastery of Microsoft office and learning technology (3.18) which was lower than the average value of student groups (3.30). This finding supported the research of [Burgess & Sievertsen \(2020\)](#) which stated that online learning for schools was a new experience for most schools when compared to Higher Education; this opinion was evident from the lack of technical skills of teachers ([Purwanto et al., 2020](#)). Based on the results of the study of [Zhafira et al., \(2020\)](#), it was found that 47% of 165 student respondents did not know about online learning media before the pandemic situation.

2. Testing Independent Samples Test for Teacher and Lecturer Groups

Table 16. Homogeneity Test and Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	T	Df	Sig. (2-tailed)	95% Confidence Interval of the Difference		
						Lower	Upper	
Impressions on learning technologies	.037	.848	-1.594	106	.114	-1.97237	.21413	
Equal variances assumed								
Equal variances not assumed			-1.591	104.074	.115	-1.97511	.21687	

Source: Research data (2020)

Based on the SPSS output presented in table 16, it was evident that the value of the Levene / 2 Test for Equality of Variances was $0.848 > 0.05$. So, it could be interpreted that the data variance between teacher groups and lecturer groups was homogeneous with Sig. (2-tailed) at equal variances assumed $0.114 > 0.05$. This means that hypothesis 2 was not accepted. That was, there was no significant difference between the perception of teachers and lecturers related to the role of learning technology in the classroom over the educational process of students. These results indicated that teachers and lecturers had a common understanding that the Internet, modern technological devices in the educational process contributed positively to the process of interaction and concentration of students while learning so that it could impact the motivation and attendance of students. In the end, it helped improve student grades and achievement.

The success of online learning was highly dependent on several integrated components, such as students, educators, learning resources, and the technology used. Online learning did not only provide assignments or online lectures. The learning model was only one direction, whereas ideally, learning must be two-way or interact with students and educators. During the pandemic, educational organizations in Indonesia were forced to be ready to provide online learning services. So, in its implementation, there were still many learning models that were one-way with a pattern of providing material and assignments online. As a result, the two-way interaction was still minimalist.

Ideal learning was learning that was oriented to the ability of students to solve problems, think critically, collaborate, communicate, be creative, and be innovative by using digital technology as a work tool. Educators in the digital era (Industrial era 4.0) leading to the era of Society 5.0. Must face millennial generation. They were challenged to build effective communication and not too long to speak in one direction. Therefore, educators need to prepare an attractive presentation of learning material with an attractive design. The appearance of fashion style also needed to be considered: not dull, formal, but also casual, so that teachers and students look fresher. To overcome the shortcomings of implementing online learning during SFH, efforts by governments and other stakeholders were needed to collaborate to improve the development of online learning infrastructure, equip educators and students with standardized home-based teaching/learning tools, conduct online teacher

training, develop scale education online national entry in the national strategic plan, and supported academic research into online education, especially education to help students who had difficulties in online learning.

Some of the disadvantages of online learning found in Indonesia today, including a lack of student discipline, limited internet access, lack of social interaction, were a challenge with educational organizations and stakeholders. Keep in mind that technology was created to complement and assist humans in carrying out their duties and responsibilities, not to replace their overall role. From these findings, it was evident that the role of teachers and lecturers cannot be replaced entirely by technology. Students in the learning process still need the physical existence of an educator because its function was not only to convey material and transfer knowledge but also to educate character and teach how to interpret and live life better. This is the true role of educators as role models of students that cannot be replaced by any technology. This opinion was supported by the results of [Hartman et al., \(2019\)](#) research which showed that 78 per cent of Generation Z respondents believed that teachers play an essential role in learning. Therefore, a blended learning program or integration between online and offline is the best learning program to be implemented in education.

Conclusion

The ability of students and university students in mastering MS office software and technical learning tools was included in the Fair level in which university students had higher average scores than students. Students use a variety of learning technology tools during the study from the home period. Most students use smartphones combined with the use of a PC or laptop. Meanwhile, the most widely used learning infrastructure in learning was the internet network. Meanwhile, other infrastructures, as a source of learning, were textbooks and television. The learning technology devices used by university students were mostly smartphones and computers (PCs or laptops) supported with the Internet. The internet usage of teachers in classrooms was in the High category, and the teachers had a positive impression of the technological tools used in education because they contributed highly to the process of interaction and concentration of students in lessons, student grades, and student achievement. It was supported by technical staff in schools who actively contributed in enriching the technical tools of learning in the classroom so that the addition of new technology tools in the classroom had an impact on increasing student motivation and attendance in class. Most of the learning tools used by teachers during LFH were internet-connected smartphones and PCs or laptops. The internet usage of lecturers during lectures in class was at a High level. There was a positive impression of the technological tools used in education because they contributed highly to the process of interaction and concentration of university students in lectures. The technology was also considered to contribute significantly to the grades and achievements of university students. Meanwhile, technically supported on campus was felt high because they actively contributed in enriching technical learning tools, so the addition of new technology tools in the classroom had an impact on increasing student motivation and attendance in class. Most of the learning tools used by lecturers during LFH were PCs or laptops and smartphones connected to the Internet. The advantages felt by educators and students with the implementation of SFH with online learning models were as follows: had flexibility in its implementation, reduce the potential for the spread of Covid-19 in the campus and school environment, increase students' courage in expressing ideas, opinions and asking questions free, and provide new learning model experiences. Some of the disadvantages of online learning according to participants were lack of motivation, lack of student discipline, fatigue, and boredom because most were only in the form of online assignments, constraints on the Internet and technological devices, and some subjects and

courses related to calculation and practices were not effective if only done through online learning. Based on the independent samples t-test, it was evident that there were significant differences between the ability of students and students regarding Microsoft office software and learning technology; Meanwhile, in the test of the differences between teacher and lecturer perceptions regarding the role of learning technology in the classroom in the education process of students, it was found that there were no significant differences.

In the field of education, education practitioners in Indonesia, who were initially forced to, eventually had to adopt new learning models in accordance with the characteristics of the Industrial Revolution 4.0 towards Society 5.0. This learning model was different from the previous curriculum pattern where students were challenged from an early age to learn independently by using a variety of media and technology, civilizing group work, and being able to collaborate and be confident in their abilities. According to Steele et al., (2019), virtual applications integrated into the curriculum could improve students' cognitive and creative skills through a student-centred environment.

This research still had disadvantages, namely the generalization of research results. Therefore, further research was needed on problem-based, collaborative online learning and other models with more equitable sampling techniques in all provinces in Indonesia in order to represent the conditions of learning in Indonesia in general. The research could also be carried out by taking samples in certain areas and examined in more detail; for example, the impact of online learning on students' grades or achievements. Could also be considered in subsequent studies, the impact of online learning systems on teacher job satisfaction and performance in online education.

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THE CHALLENGES OF ONLINE LEARNING DURING THE COVID-19 PANDEMIC

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Abstract

Abstract: Era Society 5.0 is characterized by the application of digital technology to various human activities. The Covid-19 pandemic requires almost all human activity to shift to digital media, including education services. Now, education services must adapt to online learning methods. This change is a challenge for Indonesian education which must also prepare students to adapt to face the challenges of the era of Society 5.0. This study aimed to obtain information about online learning during the study from home during the Covid-19 pandemic at the junior, senior, vocational, and university levels in Indonesia. Researchers also analysed the differences in the mastery of learning technology in students and educators. This study used a questionnaire distributed via Google forms to students and educators using Facebook, e-mail and WhatsApp Group (WAG). The total sample in this study were 108 educators and 386 students. From the independent sample t-test test, the following results were obtained: 1) the mastery ability of MS office software and online learning technology in students was higher than students with significant differences; 2) There was no significant difference between teacher and lecturer perceptions regarding the role of learning technology in the classroom and on the educational process of students. The success of online learning was highly dependent on several integrated components, such as students, educators, learning resources, and the technology used. The researcher also found several disadvantages of online learning, such as student discipline, lack of internet access, and lack of social interaction which are a common challenge for educational organizations and stakeholders. The technology was created to complement and assist humans in carrying out their duties and responsibilities, not to replace the role of humans as a whole.

Keywords: technology; covid-19; online learning

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Introduction

Human technology is increasingly developing over time. Technology can have a positive impact, depending on how humans minimize existing risks and take advantage of opportunities that arise from the development of these technologies (De Leon et al., 2020). The era of the industrial revolution 4.0 is an era where information technology is developing rapidly and colours every human life, one of which is in the field of education (Nastiti & Abdu, 2020). This development makes a new face in the phase of technological progress. Although the hustle and bustle of the industrial revolution 4.0 era are still ongoing, Indonesia is now shocked by the new concept of society 5.0. Society era Society 5.0 focused all its activities on the application of digital technology. Now, with the Covid-19 pandemic affecting the whole world, the concept of Society 5.0 must be applied, where almost all human activities use digital media.

Corona Virus Disease or better known as Covid-19, is a new type of coronavirus that attacks the human respiratory system. The disease was first identified in December 2019 in Wuhan, the capital of China's Hubei Province, and has since spread globally throughout the world without exception. This condition affects every sector of human life very quickly. The

Covid-19 pandemic has caused unprecedented damage to the education system throughout the world. In addition to measurable economic impacts in the short and long term, there is an intangible collapse in educational institutions. In particular, educators, the most critical intellectual resources of any educational organization, must face various types of difficulties, including financial, physical, and mental because of COVID-19.

To reduce the number of people with Covid-19, the Minister of Education and Culture issued a circular on March 24, 2020, which regulates the implementation of education during the emergency spread of Covid-19, as is also done by many countries. Provincial and local governments issued policies to temporarily eliminate face-to-face learning which was replaced by 'study from home' through online or online learning. This policy applies at the elementary, secondary and university level. This step is considered appropriate to prevent the spread of Covid-19 in the school or campus environment, although a limited initial survey conducted by some researchers showed that implementation in the field is still diverse. Online learning can be an effective solution for activating classrooms even though schools or universities have been closed given the enormous risks during this pandemic (Herliandry et al., 2020). Besides, the ability to master technology by educators would be increasingly encouraged to become better with online learning (Miaty, 2020).

Some regions in Indonesia protect all citizens, including students, by applying study from home. With this policy, students go through the learning process from home. Therefore, all elements of the education ecosystem must adapt to online learning methods, although in practice, they must face several obstacles. Among these constraints are the limited ownership of computers or laptops and internet access. Both of these are the main problems that cause uneven access to online learning. Similar facts were also found in developed countries such as in the United States, the United Kingdom, and Singapore (Almi, 2020).

Learning is a process that is built to develop students' creative thinking (Widodo & Kadarwati, 2013). Meanwhile, the term '*daring*' is an abbreviation of '*dalam jaringan*,' which is the Indonesian substitute of the word 'online' that is often related to internet technology. Learning process, whether using learning applications or social networking, is called online learning (Amongguru.com, 2020). According to Basilaia & Kvavadze, (2020), online learning is the experience of knowledge transfer using video, audio, images, text communication, and software supported by internet networks (Zhu & Liu, 2020). The essential factor in online learning is the readiness of educators and students to interact online.

In the field of education, the era of society 5.0 allows students to directly interact with robots specifically designed to replace educators or be remotely controlled by educators in the learning process (Elsy, 2020; Nastiti & Abdu, 2020). Current technological developments enable online learning to be implemented well. The technology adopted in education today has led to a variety of new learning models. Some of these models are learning with the help of electronic devices (e-learning), such as Compact Discs which contain material to be studied and distributed by post; distance learning (distance learning); and also online learning, where learning material/media is placed on a server that can be accessed via the Internet. According to Gikas & Grant, (2013), the implementation of online learning requires the supported of mobile devices such as smartphones, tablets and laptops that can be used to access information anywhere and anytime. Abidah et al., (2020) discussed various infrastructures that supported online learning for free, simple, and could be accessed using smartphones, namely various discussion rooms such as Google Classroom, WhatsApp, *Kelas Cerdas*, Zenius, Quipper, and Microsoft. Online learning could even be done through social media, such as Facebook and Instagram (Kumar & Nanda, 2018).

The Work from Home (WFH) and Study from Home (SFH) conditions had forced all parties to maximize the learning process. This requires optimizing the role of digital technology in educational services, where educators and students are expected to be adaptive and utilize technology quickly. Educational organizations are faced with new technologies in the form of e-learning technologies that are expected to increase flexibility for students and improve learning outcomes. Covid-19 pandemic provides positive learning from the technology side. In a short time, the use of online learning technology can increase the absorption of technology in education in Indonesia. Online learning is a form of learning method which is perceived to be student-centred. Therefore, the use of e-learning is expected to motivate improvement in the quality of learning and teaching materials, the quality of student activity and independence, and communication between lecturers and students and among students (Hayati, 2020).

The results of Dewi, (2020), showed that the implementation of online learning in elementary schools during the Covid-19 pandemic could be carried out quite well because of the collaboration between teachers, students and parents in learning at home. Furthermore, the results of (Purwanto et al., 2020) studies that used 15 respondents consisting of teachers and parents in two elementary schools in Tangerang Indonesia, showed several challenges and obstacles experienced by students, teachers, and parents in online learning. These challenges included limited communication related to socialization among students, challenges for students with special educational needs, and more extended screen time. On the other hand, parents thought that problems that arise were more related to the lack of discipline of learning at home, much time spent by parents to help children's learning at home (especially for children under Grade 4 in Primary Schools), lack of technical skills and higher internet bills. The results of Putra et al., (2020) found that there were several supporting factors for educators in the online learning process, namely the availability of smartphones, quotas and a stable internet network because not all students have smartphones. The results of Zhang et al., (2020) research on online learning in several schools and universities in China during the Covid-19 pandemic showed ambiguity and disagreement about what to teach, how to teach, the workload of teachers and students, the environment teaching, and its implications for equitable education. Good relational coordination between teachers in e-learning is needed, such as the provision of routine and timely communication mechanisms, and problem-solving to supported shared knowledge in the context of shared goals. In addition, mutual respect could lead to higher job satisfaction of teachers (Margalina et al., 2014).

The success of online learning systems is highly dependent on several integrated components between students, lecturers, learning resources, and existing technology (Mustofa et al., 2019). The results of Firman & Rahayu, (2020) showed that: (1) students already had the essential facilities needed to take part in online learning; (2) online learning was flexible in its implementation and able to encourage the emergence of learning independence and motivation to be more active in learning; (3) distance learning encouraged the emergence of social distancing behaviour and minimized the emergence of crowds to reduce the potential for the spread of Covid-19 in the campus environment. Zhafira et al., (2020) in a study of 165 students of the Faculty of Economics, Teuku Umar University who were involved in online learning during the Covid-19 quarantine period, proved that the most popular online learning media were WhatsApp and Google Classroom. As many as 53% of respondents were familiar with a variety of online learning media before online lectures began. Furthermore, the most popular communication pattern was the semi-two-way pattern, so that further research was needed on online learning research with problem-based, collaborative, and other models.

The purpose of this study was to develop previous research on learning practices during Covid-19, to get information related to the implementation of online learning during SFH in several junior high schools (junior high schools), high school/vocational schools (SMA/K), and several universities (PT) in Indonesia, learning technology used by students, students, teachers and lecturers, mastery skills of MS office software and learning technology from students and students, teachers and lecturers. Another purpose of this study was to analyse the differences in the mastery of MS Office software and learning technology in students and students as well as differences in the perception of teachers and lecturers about the role of learning technology devices in the classroom on student learning.

Covid-19 has an impact on the provision of educational services (Sintema, 2020). To supported educational services using online learning methods, students and educators are required to master a variety of software such as Microsoft Office (Word, Excel, PowerPoint) or similar. This software is essential for students in doing the tasks given by educators. Djaja (2016) believed that teachers consist of three learning modalities, including face-to-face, online, and online combinations. Djaja also conducted empirical studies on teachers and found several obstacles, including (a) Limited time of teachers (limited time), (b) Inadequate facilities and infrastructure (lack of space, weak internet network), (c) teacher's low mastery in technology. In the implementation of distance learning during the Covid-19 pandemic, there were still many teachers who only give assignments to students in the form of questions, summaries, and the like (Arika, 2020; Miaty, 2020).

For schools and universities that already have online learning applications, the adaptation process is easier than schools or universities that do not have the application. According to an empirical study before the pandemic conducted by Basri et al., (2018), with 1000 respondent students at King Abdulaziz University (KAU), Damam University (DU), Northern Border University (NBU), and Baha University (BAU), it was found that 1) there was a relationship between the Internet and Computer Technology (ICT) adoption and academic performance; 2) adoption of ICT resulted in increased performance in female students which was higher than male students; 3) in the IT department, it was found that ICTs did not have an impact on student academic achievement. Furthermore, most universities have replaced traditional exams with online assessment tools; but for schools, this situation is a new area for teachers and students. Therefore, there is a possibility of measurement error that is greater than normal conditions (Burgess & Sievertsen, 2020).

Anggraini (2018) found that the use of e-learning as a substitute for conventional lectures (non-e-learning) as an effort to improve students' analytical thinking skills on problems in the Introduction to Accounting I subject was ineffective. Thus, e-learning should not be used as a substitute for conventional learning, but rather as a supplement and complement to learning. Khusniyah & Hakim (2019) found differences in the ability of students to understand English texts between before and after the use of web blogs. Furthermore, online learning through a web blog had a positive influence on improving students' English reading skills. Navimipour & Zareie (2015) showed that e-learning systems as measured from the aspects of technology, educational content, motivation, and attitude significantly influence employee learning satisfaction.

Based on the previous description, the hypothesis is formulated as follows:

Hypothesis 1: There is a significant difference between student and student abilities related to Microsoft Office software and learning technology.

Hypothesis 2: There is a significant difference between the perception of teachers and lecturers regarding the role of learning technology in the classroom concerning the students' educational process.

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the hypothesis is already represented by the research objectives

Materials and Methods

This research was an exploratory case study to obtain information about the consequences of the Covid-19 pandemic on online learning and teaching in junior high schools, high schools, vocational schools, and universities. The population in this study were junior high school students and high school students, vocational high school students; university students, teachers, and lecturers in Indonesia. Considering that the population was substantial, to get a research sample, the distribution of questionnaires was carried out by random sampling using the Google form application. This questionnaire was distributed to teachers, lecturers, students, and university students through Facebook, messenger, e-mail, and WhatsApp Group (WAG). The link address for the lecturer questionnaire was <http://forms.gle/2YznWZ3&rvatwowUA>; the address of the student questionnaire link was <https://forms.gle/FxWTbBnRPzzZgts9A>, the address of the teacher questionnaire link was <http://forms.gle/yunmuQzXXzQ4e1Xe7>; the link address for the student questionnaire was <https://forms.gle/EkEsD5uNDG4N8a98>. The analysis technique used was descriptive and comparative analysis to analyse differences in Microsoft Office mastery and online learning technology between students and students and differences in teacher and lecturer perceptions regarding the role of learning technology in the educational process. Meanwhile, to analyse the differences in the mastery of learning technology between groups of students, an independent samples test was conducted using the IBM SPSS Statistics 22 program.

Results and Discussion

Based on the results of the distribution of questionnaires conducted by the random sampling method via the Google Form application to lecturers, teachers, university students, and students through Facebook, messenger, e-mail, and WhatsApp Group, 52 lecturers and 220 students from several universities were obtained. In addition, researchers also obtained 56 teachers and 166 junior high, high school, and vocational students from various schools in Indonesia. Thus, the total sample in this study were 108 educators and 386 students.

Table 1. Respondent Group Details

Group	Area of School or Universities	Total Respondents
Teachers	East Java : 22 Schools	56
	Central Java : 3 Schools	
	Jakarta : 1 School	
	West Java : 1 School	
	Kalimantan : 4 Schools	
Lecturers	East Java : 9 universities	52
	Central Java : 1 university	
	Yogyakarta : 2 universities	
Total Respondents		108
Students	East Java : 13 Schools	166
	Sumatera : 1 School	
	West Java : 2 Schools	
	Jakarta : 1 Schools	
Students	Jawa Timur : 5 universities	220
Total Respondents		386

Source: Research data (2020)

Descriptive Analysis Assessment Results

Descriptive analysis was intended to provide an overview of the ability of MS Office mastery and learning technology, learning technical tools used, perceptions of educators about the role of learning technology devices in the classroom in learning, and the advantages and disadvantages of study from home Covid-19 pandemic period felt by educators and students. Assessment intervals were as follows.

Table 2. Interval Assessment

Scale interval	Assessment
1,00-1,80	Very low
1,81-2,60	Low
2,61-3,40	Fair
3,41-4,20	High
4,21-5,00	Very high

Table 3. Student skills related to Microsoft Office Software and Learning Technology

A. <i>Dealing with Microsoft Office Software</i>	Average	Annotation
How good were you in creating and editing Microsoft Word files?	3.35	Fair
How good were you in creating and editing Microsoft PowerPoint presentations?	3.20	Fair
How good were you in creating and editing Tables in Microsoft Excel?	2.68	Fair
B. <i>Dealing with technology</i>		
How good were you in mastering the technical learning tools?	3.18	Fair
How good were you in using learning technology available at school/campus?	3.45	High
Average	3.18	Fair

Source: Research data (2020)

Table 4. University Student ability related to MS Software and Learning Technology

A. <i>Dealing with Microsoft Office Software</i>	Average	Annotation
How good were you in creating and editing Microsoft Word files?	3.59	High
How good were you in creating and editing Microsoft PowerPoint presentations?	3.41	High
How good were you in creating and editing Tables in Microsoft Excel?	3.01	Fair
B. <i>Dealing with technology</i>		
How good were you in mastering the technical learning tools?	3.27	Fair
How good were you in using learning technology available at school/campus?	3.21	Fair
Average	3.30	Fair

Source: Research data (2020)

In Table 3, it was evident that the average value of the ability of students who become respondents in mastering MS Office software and technical learning tools was at the Fair level. However, the ability to use learning technology available in schools was at a High level. Meanwhile, Table 4 explained that university student respondents had high ability in mastering Microsoft Word and Microsoft PowerPoint files. However, the ability to create and edit tables in Microsoft Excel was only at the Fair level. Meanwhile, capabilities related to technical learning tools and the use of the technology available on campus were at the Fair level.

When compared, the average ability of university students related to MS office software and learning technology was higher than students. This situation was understandable because the implementation of learning from home during the Covid-19 pandemic was not a normal learning phase, but an emergency period. After all, the environment was being endangered by a dangerous pandemic. To be better prepared for online learning, students

must be healthy, happy, not stressed, and gradually trained to become independent and diligent learners.

Table 5. Students Online Learning Tools During the Covid-19 Pandemic

Tools	Percentage (%)
Smartphone	38,14
Internet networking	32,77
Computer (PC or Laptop)	26,40
Smart Board	1,22
Etc (Book, TV, Module)	1,47
Total	100

Source: Research data (2020)

Table 5 presented various learning tools used by students during the home form study. Researchers found a variety of devices used, 156 students using smartphones and a combination of 108 students using a PC or laptop. The most used infrastructure of 156 students in online learning was the internet network, while the other infrastructure was textbooks and television. This finding was in accordance with [Abidah et al., \(2020\)](#), who found that online learning can use a simple and free application so that students can follow the learning process via smartphones. From the contents of the questionnaire about the impression of online learning, information was obtained that despite the many conveniences provided online learning through the Internet, and students preferred face-to-face learning.

Table 6. University Students Online Learning Tools During the Covid-19 Pandemic

Tools	Percentage (%)
Smartphone	43,60
Computer (PC or Laptop)	42,30
Internet networking	9,50
Smartphone and Laptop	4,60
Total	100

Source: Research data (2020)

Table 6 showed that during SFH, the most widely used learning tools most university students were smartphones and computers (PCs or laptops) with Internet supported. This finding was in line with the findings of [Firman & Rahayu, \(2020\)](#), which revealed that university students already had the essential facilities needed to participate in online learning. Online-based learning in the industrial era 4.0 towards the era of society 5.0 was not difficult because almost all students and educators already had smartphones or other devices to access this online-based learning. Meanwhile, the online media most preferred by students in order, were Google Classroom, WhatsApp Group, YouTube, Instagram, and Zoom ([Mustakim, 2020](#); [Zhafira et al., 2020](#)).

Table 7. Teacher's Perception Related to Learning Technology in the Classroom

Statement items/questions	Average	Annotation
How good were you at using the Internet in the classroom?	3.25	High
What was your impression about the technological tools used in the education process? Does the tool contribute to the interaction and concentration of students in the lesson?	3.53	High
What was your impression about the tools of modern technology used in the education process? Does the tool contribute to students' high grades and student achievement?	3.37	High
Technical people at your school actively contribute to enriching technical tools in the classroom.	3.82	High
The addition of new technological tools in the classroom will have a significant impact on students' motivation and presence in class.	4.19	High
Average	3.63	High

Source: Research data (2020)

In table 7, it can be seen that the internet usage of the teachers when in the classroom was at a High level. The teachers also had a positive impression of the technological tools used in education because they contribute highly to the process of interaction and concentration of students in lessons and students' grades and achievements. The supported of technical staff in schools were also high because they actively contribute to enriching technical learning tools in the classroom. Thus, the addition of new technological tools in the classroom has an impact on increasing student motivation and attendance in class.

Table 8. Teacher Learning Tools in the Classroom

Tools	Percentage (%)
Computer (PC or Laptop)	27,53
Internet networking	21,91
Projector	20,78
Smartphone	17,98
Book, TV, Module	8,99
Smart Board	2,81
Total	100

Source: Research data (2020)

In table 8, it could be seen that most of the learning devices used by teachers in the classroom were Internet-connected PCs or laptops, projectors (LCD), and smartphones.

Table 9. University Students Online Learning Tools During the Covid-19 Pandemic

Tools	Percentage (%)
Smartphone	34.81
Internet networking	34.81
Computer (PC or Laptop)	26.68
LCD, Smart Board, WA, TV	3.70
Total	100

Source: Research data (2020)

In table 9, it was evident that most of the learning tools used by teachers during LFH were smartphones and PCs or laptops that were connected to the Internet. Online learning could take place because there were several supporting factors, including smartphones, quotas, and a stable and good internet network (Putria et al., 2020). Table 9 also showed that Smartphones were a major supporting factor in online learning during SFH.

Table 10. Lecturer Perception related to Learning Technology in Classroom

Statement items/questions	Average	Annotation
How good were you at using the Internet in the classroom?	3.63	High
What was your impression about the technological tools used in the education process? Does the tool contribute to the interaction and concentration of students in the lesson?	3.98	High
What was your impression about the tools of modern technology used in the education process? Does the tool contribute to students' high grades and student achievement?	3.60	High
Technical people at your school actively contribute to enriching technical tools in the classroom.	3.61	High
The addition of new technological tools in the classroom will have an enormous impact on students' motivation and presence in class.	4.11	High
Average	3.78	High

Source: Research data (2020)

In table 10, it could be seen that the internet usage of lecturers during lectures in class was at a high level. In addition, there was a positive impression of the technological tools used in education because they contributed highly to the process of interaction and concentration of students in lectures as well as to students' grades and achievements. Basri et al., (2018) showed that the adoption of ICT (information and communication technology) and student academic performance was positively and significantly related. Technical supported on campus was felt high because they actively contributed to enriching the learning tools in the classroom. Thus, the addition of new technology tools in the classroom could have an impact on increasing student motivation and attendance in class. Sianturi (2018) showed that internet usage on university students could significantly influence the motivation of university students in using e-learning. Puspitasari et al., (2018) found that the use of instructional media significantly influenced the motivation of students. Meanwhile, if online learning with the Edmodo application continued to be done, student achievement would increase, and the teacher would also save time and energy in the learning process (Sobron et al., 2019).

Table 11. Lecturer Learning Tools in the Classroom

Tools	Percentage (%)
Computer (PC or Laptop)	32,03
Internet networking	24,18
Projector (LCD)	24,18
Smartphone	15,03
Smart board, white board, speaker	4,58
Total	100

Source: Research data (2020)

Table 11 showed that most of the learning devices used by lecturers in the classroom were PCs or laptops that were connected to the Internet, projectors (LCD), and smartphones.

Table 12. Lecturer Learning Tools During LFH

Tools	Percentage (%)
Internet networking	42.30
Computer (PC or Laptop)	34.60
Smartphone	13.50
Computer, smart phone, laptop, internet	9.60
Total	100

Source: Research data (2020)

In table 12, it was evident that most of the learning tools used by lecturers during LFH were PCs or laptops and smartphones connected to the Internet. The development of cheap and easy information and communication technology in the Industrial 4.0 era towards the era of Society 5.0. Had a significant influence on the teaching and learning process because it removes the limitations of space and time which had so far restricted the world of education. Tables 11 and 12 showed that educators use technology tools were supported by easy access to technology to improve the quality of learning.

Advantages and Disadvantages of Online Learning during the Covid-19 Pandemic

Table 13 and table 14 presented a summary of the advantages and disadvantages of implementing online learning during SFH during the Covid-19 pandemic based on the opinions of students, university students (386 respondents), as well as the opinions of teachers and lecturers (108 respondents) from various educational organizations in Indonesia.

Table 13. Summary of the Advantages of Online Learning

No	Advantages of Online Learning
1	Learning activities were more flexible so that the teacher could manage time well. Teachers and students could set their own learning time. Finally, the teacher had plenty of time to prepare teaching material.
2	More discipline in the use of time because learning with internet access requires additional costs.
3	More encouraging students to be more independent.
4	Material and learning outcomes of students Fast and very well documented, so it was very easy to do the task tracking or learning outcomes of students (integrated material, assignments, grades, presence).
5	Online learning through space and time, mentoring students through the Internet, tasks could be completed and done at any time.
6	Better health, avoid Covid-19
7	No need to leave the house (workplace) to go to a place of study, save energy and transportation.
8	Learning could be carried out more varied according to the RPS in the form of learning videos, e-books and quizzes.
9	Educators become more creative, know the use of IT, and familiarize themselves with technological advancements.
10	It was directly proportional to the creativity and digital literacy of lecturers and students
11	More comfortable and relaxed, and students were also more relaxed in learning, students were more eager to work on assignments.
12	Students were more creative in giving arguments and looking for information and were more willing to discuss.
13	The course material must be more detailed because only with writing as the primary explanation and more motivated to make teaching materials.
14	Online learning (study from home) teaches the ethics of learning from home (dress modestly, be as formal as learning on campus and school.
15	Online learning teaches educators to be more patient, flexible, empathic, and anticipatory to all possibilities that could occur during online learning (for example, the internet network suddenly weakens).

Source: Primary data (2020).

Table 13 showed the advantages felt by educators and students by implementing the SFH online learning model. This finding was consistent with the results of previous studies that online learning had flexibility in its implementation and was able to encourage social distancing behaviour, could reduce the potential for the spread of Covid-19 in the campus environment, and eliminate awkward feelings so students could express ideas, opinions and ask questions freely; online learning could provide students with more meaningful learning experiences (Sobron et al., 2019) and provided new experiences more challenging than conventional learning models (Kuntarto, 2017). The results of online learning English studies with complementary media web blogs proved that online learning could improve students' reading skills (Khusniyah & Hakim, 2019).

Table 14. Summary of Online Learning Disadvantages

No	Disadvantages of Online Learning
1	Social activities and interactions were reduced, interaction or socialization with students and co-workers was reduced, and emotional attachment between students and educators was reduced, less satisfied because there were no face-to-face meetings.
2	Less optimal learning because it could not provide a sufficient explanation, lack of student participation, and learning implementation plans were not achieved optimally.
3	The material could not be received clearly by students, so students feel confused, so some questions were given to the teacher repeatedly
4	Less effective if the number of students was more than 40
5	Unstable or unequal internet connections in some places could hamper the learning process
6	Online learning models for specific subjects (calculation, design, and laboratory) were not effective
7	In terms of the learning process lacking quality, students lack an understanding of the material, which impacts the quality of the results.

8	Limitations of students in exploring online lectures caused by the use of the Internet, so students could not actively participate in the whole learning process, and not 100% of students had smartphone devices
9	Learning supported tools were not adequate if, at work, the facilities provided were complete
10	Learners were not yet fully prepared with online learning, the ability of students to capture material was not the same
11	Unable to control students' assignments directly when compared to face to face, this was related to originality
12	Cause fatigue and burnout, especially for students.
13	Honesty and responsibility aspects of students.
14	It was difficult to control the level of learning competency achievement
15	Prefer to study at school/campus, because when SFH, the assignments become more numerous, and communication with educators was less than optimal
16	Learning was only in the form of online assignments, not online schools

Source: Research data (2020)

The results support this result in supporting [Briannur et al. \(2020\)](#) which shows that there is less effective online learning due to the lack of facilities and infrastructure and unpreparedness of technology education. The results of this study supported the findings of [Bøe \(2018\)](#), which proved that there was no significant relationship between teacher satisfactions to continue using e-learning technology. This is in line with china's national online learning experiments during the Covid-19 pandemic also showed a number of difficulties in their implementation, such as disadvantages in online teaching infrastructure, lack of teacher experience (including unequal learning outcomes caused by diverse teacher experiences), information gaps, environmental difficulties complex at home, lack of discipline, less effective online education processes, and long-term online teaching could have a negative impact on students' mental and physical health ([Zhang et al., 2020](#)). The Covid-19 pandemic situation is a situation where there was a sudden change from a study from school to study from home. It is an emergency, so education practitioners were less able to prepare learning systems and online learning materials maturely and systemically.

In table 14, we saw some of the disadvantages of online learning. According to the participants, they were less motivated, and there was also a significant increase in online assignments. Therefore, most of the student respondents expected more conventional learning models. On the other hand, educators felt fatigued and burnout. To overcome these challenges, educators needed creativity. They should not only place students as 'listeners' or 'viewers', but also encourage their active participation to interact, dialogue, collaborate, share and build knowledge together. If educators could make the learning process more fun, students would be more interested in participating in the learning process ([Mustakim, 2020](#)). [Hikmatiar et al., \(2020\)](#) proved that the use of Google Classroom as a learning medium had a positive impact on improving learning outcomes, interests and motivation of students in learning, and fostering creative attitudes towards students or students. For specific subjects and subjects related to calculation and practice, it was not sufficient if only done through online learning. [Mustakim, \(2020\)](#) argues that in order to increase the effectiveness of online learning, especially in the matter of calculation, it was better for the questions given to be more varied and different for each student. In addition, assignments must be included with an explanation of how to work.

Independent Samples Test

To test the significance of differences in students and university student abilities related to MS office software and learning technology, as well as the significance of differences in teacher and lecturer impressions related to learning technology, an Independent Sample t-Test was conducted. Homogeneity testing using the Levene's Test was done before the difference test. The test results were presented in the following table 15 and 16.

1. Independent Samples Test for Student and Student Groups

Table 15. Homogeneity Test and Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					
		F	Sig.	T	Df	Sig. (2-tailed)	95% Confidence Interval of the Difference		
							Lower	Upper	
Learning technology abilities	Equal variances assumed	.056	.812	-2.052	384	.041	-1.27817	-.02730	
	Equal variances not assumed			-2.036	344.520	.043	-1.28335	-.02213	

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Source: Research data (2020)

Based on the SPSS output presented in table 15, it was found that the value of Levene/2 Test for Equality of Variances was $0.812 > 0.05$. So, it could be interpreted that the data variance between student groups and student groups was homogeneous or the same, so that the interpretation of output independent samples t-test was guided by the values contained in the Equal variances assumed column. In table 15, it could be seen that the Sig. (2-tailed) at the equal variances assumed was $0.041 < 0.05$. This means that hypothesis 1, namely there was a significant difference between the ability of students and students related to Microsoft office software and learning technology was accepted. This result was supported by the average value of the ability of student groups related to mastery of Microsoft office and learning technology (3.18) which was lower than the average value of student groups (3.30). This finding supported the research of Burgess & Sievertsen (2020) which stated that online learning for schools was a new experience for most schools when compared to Higher Education; this opinion was evident from the lack of technical skills of teachers (Purwanto et al., 2020). Based on the results of the study of Zhafira et al., (2020), it was found that 47% of 165 student respondents did not know about online learning media before the pandemic situation.

2. Testing Independent Samples Test for Teacher and Lecturer Groups

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Table 16. Homogeneity Test and Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					
	F	Sig.	T	Df	Sig. (2-tailed)	95% Confidence Interval of the Difference		
						Lower	Upper	
Impressions on learning technologies	.037	.848	-1.594	106	.114	-1.97237	.21413	
Equal variances assumed								
Equal variances not assumed			-1.591	104.074	.115	-1.97511	.21687	

Source: Research data (2020)

Based on the SPSS output presented in table 16, it was evident that the value of the Levene / 2 Test for Equality of Variances was $0.848 > 0.05$. So, it could be interpreted that the data variance between teacher groups and lecturer groups was homogeneous with Sig. (2-tailed) at equal variances assumed $0.114 > 0.05$. This means that hypothesis 2 was not accepted. That was, there was no significant difference between the perception of teachers and lecturers related to the role of learning technology in the classroom over the educational process of students. These results indicated that teachers and lecturers had a common understanding that the Internet, modern technological devices in the educational process contributed positively to the process of interaction and concentration of students while learning so that it could impact the motivation and attendance of students. In the end, it helped improve student grades and achievement.

The success of online learning was highly dependent on several integrated components, such as students, educators, learning resources, and the technology used. Online learning did not only provide assignments or online lectures. The learning model was only one direction, whereas ideally, learning must be two-way or interact with students and educators. During the pandemic, educational organizations in Indonesia were forced to be ready to provide online learning services. So, in its implementation, there were still many learning models that were one-way with a pattern of providing material and assignments online. As a result, the two-way interaction was still minimalist.

Ideal learning was learning that was oriented to the ability of students to solve problems, think critically, collaborate, communicate, be creative, and be innovative by using digital technology as a work tool. Educators in the digital era (Industrial era 4.0) leading to the era of Society 5.0. Must face millennial generation. They were challenged to build effective communication and not too long to speak in one direction. Therefore, educators need to prepare an attractive presentation of learning material with an attractive design. The appearance of fashion style also needed to be considered: not dull, formal, but also casual, so that teachers and students look fresher. To overcome the shortcomings of implementing online learning during SFH, efforts by governments and other stakeholders were needed to collaborate to improve the development of online learning infrastructure, equip educators and students with standardized home-based teaching/learning tools, conduct online teacher

training, develop scale education online national entry in the national strategic plan, and supported academic research into online education, especially education to help students who had difficulties in online learning.

Some of the disadvantages of online learning found in Indonesia today, including a lack of student discipline, limited internet access, lack of social interaction, were a challenge with educational organizations and stakeholders. Keep in mind that technology was created to complement and assist humans in carrying out their duties and responsibilities, not to replace their overall role. From these findings, it was evident that the role of teachers and lecturers cannot be replaced entirely by technology. Students in the learning process still need the physical existence of an educator because its function was not only to convey material and transfer knowledge but also to educate character and teach how to interpret and live life better. This is the true role of educators as role models of students that cannot be replaced by any technology. This opinion was supported by the results of [Hartman et al., \(2019\)](#) research which showed that 78 per cent of Generation Z respondents believed that teachers play an essential role in learning. Therefore, a blended learning program or integration between online and offline is the best learning program to be implemented in education.

Conclusion

The ability of students and university students in mastering MS office software and technical learning tools was included in the Fair level in which university students had higher average scores than students. Students use a variety of learning technology tools during the study from the home period. Most students use smartphones combined with the use of a PC or laptop. Meanwhile, the most widely used learning infrastructure in learning was the internet network. Meanwhile, other infrastructures, as a source of learning, were textbooks and television. The learning technology devices used by university students were mostly smartphones and computers (PCs or laptops) supported with the Internet. The internet usage of teachers in classrooms was in the High category, and the teachers had a positive impression of the technological tools used in education because they contributed highly to the process of interaction and concentration of students in lessons, student grades, and student achievement. It was supported by technical staff in schools who actively contributed in enriching the technical tools of learning in the classroom so that the addition of new technology tools in the classroom had an impact on increasing student motivation and attendance in class. Most of the learning tools used by teachers during LFH were internet-connected smartphones and PCs or laptops. The internet usage of lecturers during lectures in class was at a High level. There was a positive impression of the technological tools used in education because they contributed highly to the process of interaction and concentration of university students in lectures. The technology was also considered to contribute significantly to the grades and achievements of university students. Meanwhile, technically supported on campus was felt high because they actively contributed in enriching technical learning tools, so the addition of new technology tools in the classroom had an impact on increasing student motivation and attendance in class. Most of the learning tools used by lecturers during LFH were PCs or laptops and smartphones connected to the Internet. The advantages felt by educators and students with the implementation of SFH with online learning models were as follows: had flexibility in its implementation, reduce the potential for the spread of Covid-19 in the campus and school environment, increase students' courage in expressing ideas, opinions and asking questions free, and provide new learning model experiences. Some of the disadvantages of online learning according to participants were lack of motivation, lack of student discipline, fatigue, and boredom because most were only in the form of online assignments, constraints on the Internet and technological devices, and some subjects and

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The discussion should be a substance supporting the results, which at least includes comparisons of the results of this study with previous relevant research, if the results are so, explain in detail the reasons. Contains interpretation of findings, and generalizes the findings into an established theoretical order.

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make it 1 paragraph only
conclusions contain conceptual studies, results, and contributions of research results to the scientific field

courses related to calculation and practices were not effective if only done through online learning. Based on the independent samples t-test, it was evident that there were significant differences between the ability of students and students regarding Microsoft office software and learning technology; Meanwhile, in the test of the differences between teacher and lecturer perceptions regarding the role of learning technology in the classroom in the education process of students, it was found that there were no significant differences.

In the field of education, education practitioners in Indonesia, who were initially forced to, eventually had to adopt new learning models in accordance with the characteristics of the Industrial Revolution 4.0 towards Society 5.0. This learning model was different from the previous curriculum pattern where students were challenged from an early age to learn independently by using a variety of media and technology, civilizing group work, and being able to collaborate and be confident in their abilities. According to Steele et al., (2019), virtual applications integrated into the curriculum could improve students' cognitive and creative skills through a student-centred environment.

This research still had disadvantages, namely the generalization of research results. Therefore, further research was needed on problem-based, collaborative online learning and other models with more equitable sampling techniques in all provinces in Indonesia in order to represent the conditions of learning in Indonesia in general. The research could also be carried out by taking samples in certain areas and examined in more detail; for example, the impact of online learning on students' grades or achievements. Could also be considered in subsequent studies, the impact of online learning systems on teacher job satisfaction and performance in online education.

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The Challenges of Online Learning During the Covid-19 Pandemic

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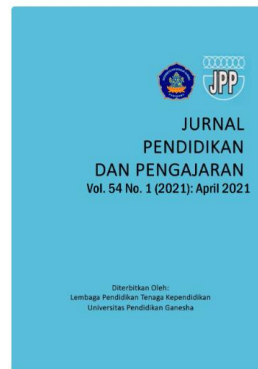
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ABSTRACT

The Covid-19 pandemic requires almost all human activity to shift to digital media, including education services. Now, education services must adapt to online learning methods. This change is a challenge for Indonesian education, which must also prepare students to adapt to face the challenges of the era of Society 5.0. This study aims to obtain information about online learning from



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