



## ANALYSIS OF LEARNING LOSS: AN INSIGHT FROM BIOLOGY EDUCATION DEPARTMENT

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### ABSTRACT

The process of transitioning face-to-face learning to online learning requires rapid adjustments by teachers and students to the learning process, and if not, it can lead to learning loss. Only view studies have been done related to learning loss, therefore this study aims to analyze a) differences in learning before and after the pandemic, b) learning loss during the pandemic, c) the factors that caused learning loss during the pandemic, d) efforts that can be applied to tackle learning loss. This research was a qualitative descriptive study with a phenomenological approach located at Mahasaraswati University Denpasar with a sample of 65 participants include lecturers and students. Data collection techniques were carried out by observation, interviews, documentation, and triangulation. The result of this study is a complex description of learning loss analysis. The conclusion of the research shows that learning loss occurs in various aspects such as learning time, learning attitude, process ability, knowledge, and learning process.

**Keywords:** learning loss, online learning, teaching and learning, biology education, covid-19

### INTRODUCTION

COVID-19 pandemic has forced the government to act appropriately and effectively to make policies in various fields, including education. One of these policies is school closures, which means that teaching and learning cannot be carried out in schools by meeting face-to-face directly (Kemdikbud, 2020b). This policy was taken by taking into account the latest results and findings related to the impacts, especially in the health sector. The very fast spread of the virus and the clinical consequences it causes, especially in people with comorbidities, are the main considerations in making these policies (Shobri et al., 2021; Utari, 2021). The policy of school closures in areas with a high to moderate incidence of COVID-19 is being implemented in various parts of Indonesia, one of which is Bali. This requires every authorized institutional

manager to prepare to be able to adapt quickly in managing an effective learning process during the pandemic by following the adjustment of learning policies during the pandemic (Kemdikbud, 2020a). Online learning is the right solution to these problems (Harahap & Harahap, 2021; Khaleyla et al., 2021).

The characteristics of online learning that can be accessed by various groups of people from various places without any time restrictions are ideal to be applied in the midst of the covid-19 pandemic (Boetccher, J. V., Conrad, 2016; Titan et al., 2018). Online learning provides various advantages to support the achievement of 21st century skills such as increasing teacher and student ICT knowledge and mastery, making it easier for students to submit assignments, saving paper use, such as research findings (Harahap & Harahap, 2021). The effectiveness of online learning

requires the following: 1) adequate facilities and infrastructure for the implementation of online learning such as computers, tablets, androids, internet; 2) digital literacy skills of teachers and students; 3) the ability of teachers to organize the content in the curriculum content to be sorted into basic concept material that must be mastered by students; 4) the ability of teachers to create a conducive learning atmosphere; and 5) teacher and student motivation (Abdul, R.M., Ahmad, Z.Z., Mohd, Z.N.A. Yusof, 2021; Kemendikbud, 2020; Mahmud, Yogi Saputra, German, 2021; Riedl et al., 2021; Thohir et al., 2021).

The absolute requirement for online learning is the availability of adequate facilities and infrastructure where this condition will be increasingly difficult with various limitations such as economic capacity and limited internet access for people in rural areas (Arifa, 2020). Another obstacle lies in the readiness of human resources (HR) in this case teachers and students who are not familiar with the use of learning management systems (LMS) as well as technical obstacles in the form of internet signal disturbances causing a decrease in the learning mood of students (Sulistyo & Alyani, 2021). A similar study conducted by (Aboagye et al., 2020) found that the main obstacles in the online learning process include: 1) accessibility issues which include internet connection and device compatibility; 2) social problems in the form of limited interaction between students and lecturers; and 3) the ability of lecturers in the form of lack of assistance and setting of materials/learning objectives that are not clear.

The various obstacles above need special attention to overcome the negative impact of online learning during the COVID-19 pandemic which has lasted more than 1.5 years in 160 countries including Indonesia (De Giusti, 2020). Various studies have been carried out to examine the readiness and impact of online

learning which states that online learning has an impact on students' difficulties in learning related to learning methods that focus on giving assignments without a regular schedule (Santosa, 2020) this can lead to student boredom in learning. The readiness of teachers and students is also important to support the success of online learning, the results of research (Aboagye et al., 2020) state that students are not ready to take part in online learning, student rejection of new learning strategies can cause the next impact, namely demotivation of students and decreased student learning outcomes, while the limitations of teacher and student interactions are also found in the findings which can cause learning to be less meaningful.

Various findings above can cause learning loss. Not much research has been done in the study of learning loss, both locally and internationally. Therefore, this study will explore further the experiences and insights of lecturers and college student regarding learning losses that occurred at Mahasaswati University Denpasar. The phenomenology of learning loss will be studied in the form of the following problems: 1) how is learning before and after covid-19?, 2) what are the forms of learning loss that occurs during online learning?, 3) what are the factors that cause learning loss?, and 4) what are the measures that can be implemented to address this learning loss? The purpose of this study is to describe the condition of learning loss in accordance with the above problems so that it can be a solution related to patterns of action that can be applied to prevent the spread of the learning loss condition.

This study examines an in-depth focus on the phenomenon of learning loss that occurs so that the characteristics of the problem are still not understood in detail, therefore this research belongs to the type of qualitative descriptive research with a phenomenological approach (Sugiyono, 2019). Phenomenologists are "interested in human consciousness as a way to

understand social reality, particularly how one 'thinks' about experience; in other words, how consciousness is experienced" (Hesse-Biber & Leavy, 2011). Observation of social situations is limited to the Biology Education Study Program, Mahasaraswati Denpasar University with the number of participants being 10 lecturers and 55 students. Data collection techniques in the form of observation, interviews, documentation and triangulation. The process of extracting further data was determined through purposive and snowball sampling techniques through structured in-depth interviews.

## METHOD

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The data collection process is carried out through 4 stages. Initial data mining was carried out through in-depth interviews addressed to head of the Biology Educational Study Program with three more lecturers and also involves 6 students. After obtaining an overview of the facts through the results of the interview, then filling out a survey by all lecturers and students to get more complete data, this process is the second stage of data mining. Furthermore, the third stage of data search is carried out through participatory observation/participatory observation by directly observing the ongoing online learning process through video conference Google Meet. The last stage of the data collection process is searching for documents recording student learning outcomes before and after the pandemic. The data collection process is presented as shown in Figure 1 below.

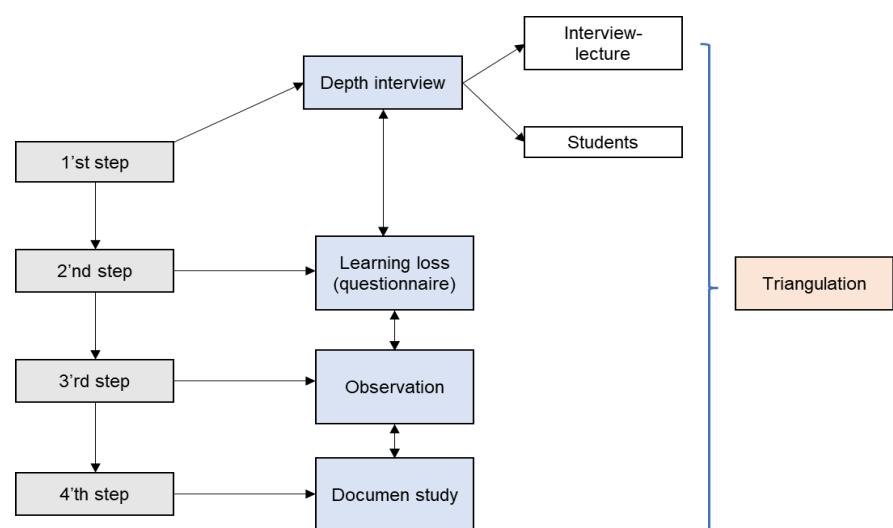


Figure 1. Data collecting phase

Giving meaning to the phenomenon of learning loss is done by analyzing each data that has been collected and performing the triangulation technique of Figure 1. to obtain an accurate meaning. The use of the triangulation technique at the same time tests the credibility of the data (Sugiyono, 2019) because with this technique the data obtained is consistent and definite so as to minimize the presence of inconsistent data. The data analysis technique used in this study is the data analysis of the Miles and Huberman models through three stages, namely data reduction, data display and data verification as shown in Figure 2.

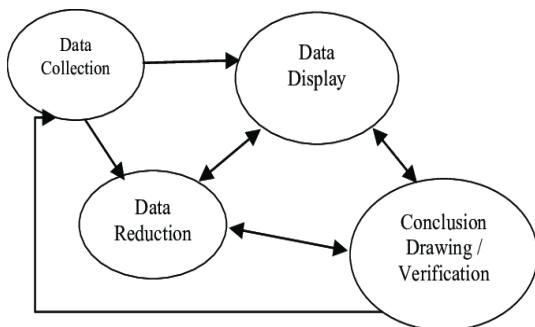


Figure 2. Data processing technique Source:  
(Hashimov, 2015)

**Table. 1** Achievement Results for each Indicator of Science Process Skills during treatment

Data Collection (theme)	Data Display (Sub Theme)	Conclusion (indicator)
Differences in teaching and learning before and after a pandemic	Teaching and learning strategy  The way in teaching and learning  Learning resource  Learning attitude	Synchronous Asynchronous Blended learning Flipped learning  Everywhere anytime Accessible Video-based LMS Modul You tube  Motivation Attention - retention Self-regulated learning Discipline Emotional closeness

Based on these data, it can be observed that there are differences during

All data that has been lost in learning that is collected through interview techniques as well as questionnaires and observations will be continued with the display stage to be identified and grouped according to certain themes or sub-themes, this grouping process involves data reduction. Furthermore, after arranging the data groups based on the theme or sub-theme, meaning will be given at the conclusion/drawing verification stage.

## RESULTS AND DISCUSSION

This study findings are grouped into 4 main parts, namely data on differences in learning outcomes before and after the pandemic, data on forms of learning loss, data on factors that cause learning loss and data on efforts that can be implemented to overcome learning loss. The detailed data explanation will begin with data on differences in learning before and after the pandemic which can be observed in Table 1 below.

the transition of the face-to-face learning process to online, including in the

categories of learning strategies used, learning methods, learning resources and learning attitudes. A very real change in learning during the pandemic is the learning process that previously took place face-to-face to online learning (Santosa, 2020). Based on the results of interviews with lecturers, it was said that the online learning approach had been carried out before the pandemic in the form of blended learning. This is done to prepare students to improve students' digital literacy skills which are an absolute skill to be able to compete in the 21st century. However, after the pandemic online learning strategies are more varied with the aim of providing conducive learning situations and conditions so as to reduce student boredom in learning. Effective strategies to teach at the right level will need to be designed and rapidly deployed when schools reopen (Azevedo et al., 2021). Judging from the ease of access to learning in the sub-theme of learning

methods, learning after the pandemic is considered more effective because it can be reached from various places without time restrictions, so students can access continuously material they do not understand. Students can review the learning materials as much as they need (Zeng & Wang, 2021). Learning resources after the pandemic are considered richer than before. Lecturers try to provide a variety of learning resources in the form of e-books, modules and learning videos as an effort to support students' understanding of concepts. However, in this study, students' learning attitudes after the pandemic decreased both in terms of motivation, discipline and focus on learning. This happens because most of the students feel bored.

The second detailed data explanation about learning loss aspect can be observed in Table 2 below.

**Table 2.** learning loss aspect

Data Collection (theme)	Data Display (Sub Theme)	Conclusion (indicator)
Form of learning loss	Learning time Learning attitude	Shorter than before Lack of attention and retention Demotivated Lack of discipline Dependent (lack of self-regulated learning)
	Process skills Knowledge	Lab skills (decrease) Decrease of understanding Lack of creativity
	Social interaction	Decrease of togetherness
	Teaching and learning process	Shorten time discussion Online environment teaching and learning social interaction

The findings of learning loss in this study are Table 2, consisting of various aspects, namely: a) learning time, b) learning attitude, c) process ability, d) knowledge, and e) learning process. The results of filling out a survey by students in this study showed that 100% of them agreed that there was learning loss in online learning during the pandemic. The results

of interviews with representatives of lecturers and students showed a variety of responses as summarized in Table 2 above. The search for learning outcomes evaluation documents also shows a decline in student understanding after the pandemic due to learning attitudes that tend to be less supportive of the online learning process. (Chung et al., 2020) found that students

were not ready for online learning due to lack of learner control, self-directed learning and online communication efficacy. This study is in line with the findings (Engzell et al., 2021) who states a learning loss of about 3 percentile points or 0.08 standard deviations, this effect is equivalent to one-fifth of a school year, the same period that schools remain closed. Online learning difficulties due to limited

access and poor learning concepts weakening student achievement (Rumata & Suyadi, 2021). The difficulty of online learning in biology learning in particular lies in the aspect of mastering practical skills.

The third detailed data explanation about factors that influence of learning loss can be observed in Table 3 below.

**Table 3.** Factors that Influence in Learning Loss

<b>Data (theme)</b>	<b>Collection</b>	<b>Data Display (Sub Theme)</b>	<b>Conclusion (indicator)</b>
factors that influence of learning loss		Facilities and infrastructure Accessibility	Phone, computer, laptop Adequate internet access Internet connection in rural area The required technology is unavailable Incompatible software and hardware Internet bundle cost
		Teacher skills	Lack of digital/media literacy Quality in design online materials Creative pedagogy skill
		Student skills	Lack of digital/media literacy Lack of self-regulated learning Lack of motivation Lack of discipline
	Parent's background	Socio-Economic	Internet bundle cost Provision in facilities and infrastructure Learning assistance

Based on the data in Table 1, it The findings in the form of factors that cause learning loss are summarized in Table 3. This study reveals that there are at least 5 aspects that are factors that cause learning loss, namely: 1) availability of facilities and infrastructure; 2) accessibility; 3) teacher's ability; 4) the ability of students and 5) the socio-economic status of parents. (Engzell et al., 2021) states that learning losses are up to

60% larger among students from less-educated homes. This study is in line with the findings (Aboagye et al., 2020) which states that the constraints of the online learning process include accessibility, social limitations in the form of interaction and the ability of teachers to cause learning loss. Online learning can hinder and even stop the learning process for schools in remote areas due to limited internet access

and school fees and students who do not (Santosa, 2020).

From sub aspect of strategy instructional both synchronous and asynchronous are liked by student based on the survey in this study. The quality of the asynchronous component is important. The learning materials should be carefully selected to increase comprehension and decrease student frustration as difficulty in learning materials has a negative effect on student online learning satisfaction (Chung et al., 2020). Berdasarkan temuan data dalam penelitian ini sikap siswa selama mengikuti pembelajaran online dinilai menurun baik dari hasil wawancara dengan dosen ataupun dengan mahasiswa. School closure also contributed to increased

anxiety among children and loneliness in young people along with a significant increase in child stress, sadness, frustration, indiscipline, and hyperactivity (Chaabane et al., 2021). (Mello, 2016) explored students' engagement with self-directed learning (SDL) by offering them well designed content and materials online. Findings from the current study revealed that students were not ready for an online learning experience in this pandemic era in other word it could be attributed to the fact that the students are already attached to the conventional approach (Aboagye et al., 2020).

The fourth detailed data explanation about countermeasures of learning loss can be observed in Table 4below.

**Table 4.** Countermeasures of learning loss

Data Collection (theme)	Data Display (Sub Theme)	Conclusion (indicator)
Countermeasures of learning loss	Institution/policy makers & government	<p>Provide facilities and infrastructure</p> <p>Regulate online learning policy standard</p> <p>Train the lecturer in advance online teaching</p> <p>Provide access Internet connection in rural area</p> <p>Provide Learning Management System (LMS)</p> <p>Provide open resource learning</p>
	Lecturer (mastery of online teaching skills)	<p>Improve skill in digital literacy include LMS</p> <p>Improve quality in design online materials</p> <p>Improve skill in planning the online learning process</p>
	Student (mastery of online learning skills)	<p>Improve skill in digital/media literacy</p> <p>Improve your self-regulated learning</p> <p>Improve your motivation in learning</p> <p>Try to be discipline</p>
Parents		<p>Provide in facilities and infrastructure</p>

Based on the findings and discussion above, it is necessary to urgently and immediately evaluate the online learning process so that it can prevent more massive learning losses. Table 4 summarizes the meaning of the findings of this study regarding the various efforts that can be made by all stakeholders involved in the interests of this online learning. There are at least 4 groups that have a strategic role to prevent this learning loss, namely: 1) Institution/policy makers & government; 2) teacher; 3) students; and 4) parents. There is no dominant role in this prevention, all must collaborate to create a conducive online learning atmosphere. However, this research can suggest that the government as the holder of the central regulation should provide standard regulations for good online learning so that it becomes a basic reference for all educational institutions, however, teachers also always carry out evaluations in each learning process to seek better learning conditions than before. Lecturer could use of online resources as a way to provide immediate feedback helps with students' engagement in out-of-class activities (Sabates et al., 2021) states that without parental support and assistance, it can lead to total learning loss. If all conditions are good but the internal motivation and learning independence of students are low, then learning loss is still possible. Loss of learning can be anticipated by preparing a conducive learning environment in online learning. Conducive learning conditions will increase the comfort of students in learning which in turn can increase their focus. This is in line with research findings (Dhaqane & Afrah, 2016) which state that satisfaction promotes both academic achievement and retention of the student.

## CONCLUSION

There is an urgent need to provide evidence on the learning loss that occurs in Biology Education Department Mahasaswati University Denpasar, as a result of school closures during the COVID-19 pandemic. This study was motivated by this urgency and provide deep understanding of learning loss those are: 1) the difference in teaching and learning during a pandemic; 2) learning loss aspects; 3) factors that influence learning loss; and 4) countermeasures of learning loss. The findings of this study are very meaningful for overcoming more massive learning losses. Suggestions that can be given from this research will be addressed to all groups involved in the online learning process, namely to the government, managers and policy makers in institutions, teachers, students and parents. There is no dominant role in this prevention, all must collaborate to create a conducive online learning atmosphere. However, the government as the holder of the central regulation should provide standard regulations for good online learning so that it becomes a basic reference for all educational institutions that will lead to teachers as designers and implementers of the learning process. Furthermore, teachers are asked to continuously improve their digital skills and creative pedagogy including mastery of LMS, selection of media, learning resources and online learning strategies. Selection of learning resources and organization of materials, especially in designing, implementing and evaluating online learning are also very much needed for the success of online learning. Furthermore, the role of parents in mentoring, internal motivation and independent learning is also very necessary for the success of online learning during this crisis condition.

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