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The Impact of Online Learning Based Google Classroom on Increasing Students' Information Literacy Ability

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ABSTRACT

Information Literacy at the higher education level is very important. Because at the university level, information literacy tends to be problematic in fostering students' critical thinking skills in the awareness of collection of information, synthesis, analysis, description, understanding of the reasoning for the use of information and attitudes to the treatment of information. This study examined the effect of the online learning classroom of Google on enhancing the information literacy of students. This study has a quantitative research design that involves the evaluation of a single group of individuals before and after experiments. This research has been carried out with students from the study program of chemistry in biochemistry. In the class, there were 6 students, the population being the same as the survey. Data from Google forms and questionnaire items have been collected for this study. The instrument used to assess student awareness was a fair multiple-choice question. The test results for validation were 4,22% for a very valid category and reliability was 0,86 for very high categories. The findings research that the information literacy of students capacity improved because the willingness of students to learn using online learning based on Google classroom in the classroom was higher than non-online (conventional) so that student perceptions were included in the positive category. It can therefore be inferred that introducing Google classrooms focused on online learning effectively boost student information literacy ability.

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1. INTRODUCTION

In the twenty-first century, digital technologies and communication instruments are emerging in school education. Students must have the ability to access, compile, and gather useful knowledge from various digital sources for this learning pattern, determine the adequacy and reliability of data collected and evaluate whether selected information can be processed [1, 2]. So, in the 21st century students need information literacy to make learning progress effective.

Info-Literacy (IL) refers to know-how and effective methods of information management to understand the logic behind information gathering, synthesizing, analyzing, interpreting and assessing the relevant information [3, 4, 5]. IL addresses capability in four main points of view [1, 2]: A cognitive view on knowledge literacy for educating and solving problems; a meta-cognitive view of information processing capabilities; an important perspective on study appreciation and enjoyment; a socio-cultural perspective on the ability to display autonomy and social responses. The study of information literacy during this period has gained an increasing interest, especially in University education. [6] Stresses that knowledge literacy enhances the abilities of students to think critically. Meanwhile, [7] Information literacy showed to be linked to student motivation and confidence in knowledge searching the Internet. However, [8] stress how the

higher education curriculum adds critical knowledge literacy. [9] stated that at university level the concept of Literacy of knowledge remains problematic. It is less well known the importance of information literacy.

Schools and systems of education must integrate technologically rich learning platforms and tools in order to understand the potential benefits of the changing emerging technologies and the interactive learning climate [10]. ICT entry was regarded as positive regarding students' self-reported digital skills [11]. In contrast, Zhong found a negative link between the rate of ICT integration in different countries and the digital skills of young people. This result shows that an increase in the rate of ICT penetration without schools, in particular digital skills, does not enable young people to learn ICT in education. In addition, as technology is continuously evolving and complex, students need to continually develop their knowledge and skills [12]. In reality, high-performance workplaces use modern technology to increase productivity quickly. This development has contributed to fundamental changes in literature and the quality of organizational effectiveness [13, 14].

Today, higher learners are rapidly embedded in digital technology, allowing to use these technologies and develop new technologies, scientists and web designers. A lot of students want new technologies and benefit from them [15]. However, new technology continues to change students' lives [16]. This makes an online forum a way to save time, develop networking skills and educate people and enable people to keep up-to-date [17]. [18] Declared that Millennials could not respond to modern technologies in the classroom. The process of implementation thus affects their behavior target and the achievement of the learning process directly [19]. LMS is one of the most troubling higher education devices [20]. For example, Moodle, Blackboard, Edmodo, Sakai and Google Classroom are LMS. Google classroom recently increased its prominence, value and the most rapidly adopted form of university education [21]. It is an internet free software that can be used to create and manage online courses for people with a Google account.

Newly recognized, innovative and one of Google Classroom's best online learning tools. The education group accepted a proposal from Google Classroom for the e-learning method. Technology is incorporated into classrooms. The widespread use of this revolutionary technology generated literature data. Teachers can support face-to-face learning through Google Classroom [22]. Google Classroom provides fresh and varied challenges in continuing education to teachers and students. First, everybody worldwide has a package called Google education apps tools and applications. All includes Gmail, drive, and paper [23]. Second, Google Classroom usability is renowned [24] and its easy organization of work and time saving, Fast access From tablets, PCs and cellular devices. According to estimates, in the first six months Google Classroom got almost 30 million teaching and students' jobs. The educational group therefore recommends Google Classroom strongly [23]. Finally, we offer the flexibility of Google Classroom in the programming process in an online way, minimize travel costs and meet all the users. Google Classroom, a Google education program, will provide online education [25]. Google classrooms are highly recommended as they can be used anywhere and anytime via a smartphone. The students don't know about smartphones. Most of them already have Google teachings, so that effective and creative learning can be done [26].

Further study was also suggested to explore how these systems affect student training and equate user patterns with the actual goal of the system such that they are successful students. In using these technologies the method must be evaluated in a given situation so as to genuinely and under no circumstances determine its effectiveness [27]. The main assumption is that hypocritical higher education technical advantages cannot enhance learning through applying technology to traditional training [28]. Studies [29, 30] they also noted that even with a boom in educational technology capital, issues of inadequate engagement and adaptation persist in the classroom. Students' initial acceptability and sensory inclinations to incorporate these emerging technologies into educational processes are partially the result. Consequently, students' use of such facilities is still limited and it is important to resolve the reasons behind these habits. According to [20], Further research into user engagement and comfort is needed while identifying methods for enhancing learning. Furthermore, if these instruments do not take responsibility, any technology used in the classes will not work and revenues will drop well [31]. The location of Google Classroom mobile teaching. [32] Recorded the acceptance and conduct of classes by Google in universities since the usage of literature by Google Classroom is reduced worldwide.

To find solutions to existing problems based on the concept above, an invention is necessary. Researchers used learning tools through online learning models at Google classrooms to solve those problems. This model also allows students to carry out experiments / study. Teachers must be careful not to supply the contents, since teachers will deliver them electronically via the Google classroom outside the classroom. During face-to-face class, the teacher will provide the details and interactions. The instructor will focus on student comprehension checks. Chemical processes may be characterized by different fundamental natural laws. In that way, however, theoretical abstraction and rationale must be formulated and processed. Mathematical models often need quantitative formulas [33]. It is necessary to represent mathematically

because students can easily solve abstract chemical issues [34]. Students also face a problem in chemistry with the aid of mathematical equations which needs quantitatively to be solved so that students can learn the skill of representing chemistry.

The goal of this research is to increase student information literacy ability by Google Classroom online learning. The problem of research is 1) How is the impact of learning through the OLBGC model on increasing student information literacy ability?, 2) How is student perception of the OLBGC model is implemented?.

2. RESEARCH METHOD (10 PT)

Design of Research

The quantitative analysis design of this study includes the pre- and post-measuring of various groups of people. The types of pre-experimental design was one pre-test design in this study [35]. The design shape is shown in Table 1.

Table 1. Design of Research

Subject	Pretest	Posttest
One Group	O ₁	O ₂

With:

O₁ = Pretest value before OLBGC model learning.

O₂ = Posttest value after OLBGC model learning.

Teachers use Classroom Google for posting questions, connections, power points, photos, documents, games, guides and tests. Students work on Google Classroom computers everyday, such as daily question, power points, Images, quests online, Google Docs, sports, etc.

Participant(s)

The students studying chemistry in biochemistry carried out this research. A total of 65 students participated in the class with the same population as the study. The courses included 2-hour theory and 1-hour weekly courses. The tutorial includes teaching activities, lectures and practical presentations. This is a precondition for LMS institutions, especially for online learning. Therefore, over the last six months or in another area both students have experience with LMS. However, the platform now provides little engagement and an exciting learning experience for many students, in particular. To that end, students who downloaded the Google Classroom application in the beginning of the semester were sponsored by the teacher. Registration for Google classroom is compulsory. Teaching materials were available for students via slides and mobile (pdf) or YouTube videos before their lesson. Reading content was downloaded from your mobile devices and read offline. The theory course conducted in a classroom with several students in order to improve their interaction with them was decisive in the advancement of the SRS into the Google Classroom. The SRS allowed trainers to post questions and discuss issues on the stream tab during the lecture (Fig. 1).

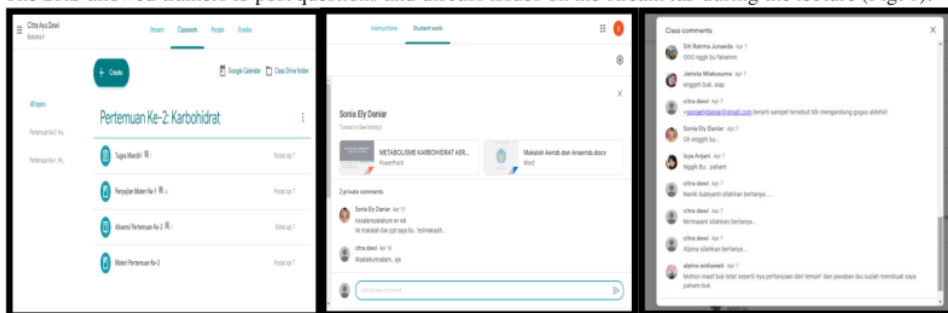


Figure 1. Google Classroom App screenshot for the student

Also relevant were submitting, handling, analyzing and collecting feedback. A easy way to synchronize publications, correspondence and note was another benefit of using the Google class. These data are available through intelligent devices and therefore Information must be disseminated promptly.

Instruments of Research

For this study data in Google format and questionnaire items were collected. Items based on the evaluation model LMS which test the commitment of students to content, communication and the delivery of

tasks. Google students are questioned at the end of the semester. The test used to investigate the ability to read information was a fair query with many options. The questionnaire for student interpretation in Google classroom focused on online learning consists of 18 statements. The tool is translated into Indonesian and reviewed by three Indonesian lecturers for the accuracy of the queries. A pilot test was then conducted to assess the questionnaire's reliability and validity. The distribution of information on questionnaire literacy ability is provided in Table 2.

Table 2. Aspect of Information Literacy

Component of Information Literacy	Indicator of Information Literacy	Item
Intermediate	<ul style="list-style-type: none"> • Define the relevant details • Select the most suitable information for the necessary information • Interpret the visual data (i.e. graphs, tables, diagrams) • Submit a research report • Preparation of bibliography • Build bibliographic records for various content types (i.e. books, articles, thesis, web pages) • Create quotes and use quotes in the document • Learn from success in problem solving 	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Basic	<ul style="list-style-type: none"> • Using various types of printed sources (i.e. books, periodicals, encyclopedias, chronologies, etc.) • Using electronic sources of information • Locate in the library information sources • Using the list of libraries • Using the library catalog to locate tools in the library 	10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20
Advanced	<ul style="list-style-type: none"> • Synthesize information newly obtained with previous information • Determine the material and the sections of a presentation (i.e. introduction, conclusion) (written, oral) • Create and arrange bibliographic records • Critique of the efficiency of the quest process and its items 	21, 22, 23, 24, 25, 26, 27, 28, 29, 30

Validity of the Information Literacy Instrument

An expert validates the information literacy instrument prior to implementation. The method has been validated with five Likert objects included, namely: 5= very valid, 4= valid, 3 = quite valid, 2 = less valid, 1 = invalid. As shown in Table3, the score obtained from validators is converted into five dimensional qualitative data [36].

Table 3. Criteria for the validity of the information literacy instrument

Validity Interval (Va)	Criteria
$Va > 4,21$	Very valid
$3,40 < Va < 4,21$	Valid
$2,60 < Va < 3,40$	Quite valid
$1,79 < Va < 2,60$	Less valid
$Va < 1,79$	Invalid

Analysis of Data

The findings of the analysis were analysed with the SPSS 23. The questionnaire comprises two variables: information literacy ability and students perception of OLBGC model. The survey will be administered one day to students. Each student is requested to respond by a 5-point Likert scale, whereby '5' is 'strongly agreed,' 4 points is 'accord,' 3 points are 'agreement,' 2 points are a 'agreement,' one point is a 'strong disagreement. The questionnaire is distributed in August-September 2020 using the Google Form Framework. Increases in student information literacy were calculated based on the standardized T-test and Hake score gain in this study.

$$1 \quad \%g = \frac{\%Sf - \%Si}{100 - \%Si} \times 100\%$$

1
With:

g = normalized gain
Sf = posttest score
Si = pretest score

Calculation results <g> are then seen in three classes of hake [37], namely:

1
Table 4. Gain Classification

Average Gain	Criteria
0,00 <g ≤ 0,30	Low
0,30 <g ≤ 0,70	Medium
0,70 <g ≤ 1,00	High

3. RESULTS AND DISCUSSIONS

In this study, the instrument used to measure students' information literacy ability was tested for expert validity and through SPSS 23 analysis. The results obtained from the expert test were 4.22% which indicated that the overall information literacy instrument was in the valid category. Based on the test results using SPSS 23 that of the 30 item items as a whole in valid criteria. As shown in Table 5.

Table 5. The Instrument Validity From Information Literacy

Items	Pearson Correlation	Sig. (2-tailed)	Category
1	.655**	.001	Valid
2	.865**	.001	Valid
3	.483**	.002	Valid
4	.565**	.000	Valid
5	.551**	.002	Valid
6	.566**	.001	Valid
7	.566**	.003	Valid
8	.555**	.004	Valid
9	.541**	.002	Valid
10	.554**	.001	Valid
11	.583**	.000	Valid
12	.627**	.001	Valid
13	.682**	.001	Valid
14	.746**	.001	Valid
15	.552**	.003	Valid
16	.876**	.001	Valid
17	.516**	.002	Valid
18	.656**	.001	Valid
19	.544**	.002	Valid
20	.521**	.002	Valid
21	.530**	.002	Valid
22	.590**	.000	Valid
23	.729**	.001	Valid

Title of manuscript is short and clear, implies research results (First Author)

24	.541**	.002	Valid
25	.544**	.001	Valid
26	.646**	.001	Valid
27	.526**	.002	Valid
28	.647**	.003	Valid
29	.876**	.001	Valid
30	.555**	.000	Valid

The instrument used to measure information literacy ability was also analyzed using the SPSS 23 (Cronbach Alpha) to determine the reliability of the instrument. Based on the analysis results, it showed that the reliability value for 30 items is 0.86, as shown in Table 6 with very high criteria.

Table 6. The Instrument Reliability from information literacy

Cronbach's Alpha	N of Items
0.86	30

3.1. The Implementation of OLBGC Model Learning

Google's online learning process involves preliminary work, core tasks and closing activities. The initial action was intended for students using an online learning media program in the Google classroom. Students need to learn and talk through the Google classroom application in key activities. In contrast, the lecturer can supply a virtual laboratory for biochemistry practice in the Google Classroom App. Students participate in the observation and study process individually. Students may also share their views at the closing events, complete the studied material and conduct tasks at the end of each meeting. The following is the report on the introduction of Google's online learning, presented in Figure 2.

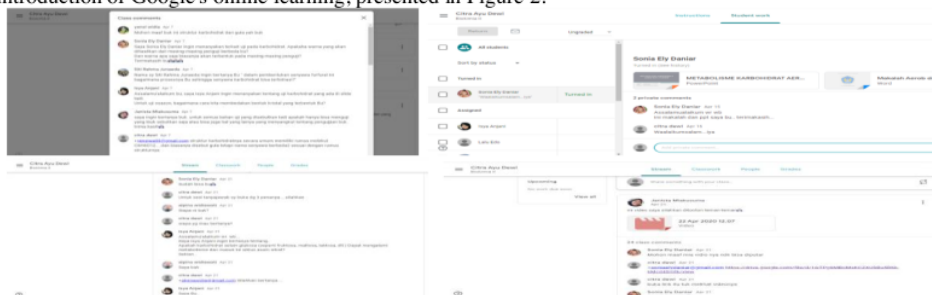


Figure 2. The introduction of Google classroom online learning

Early learning stages were still confused with using online information through Google Classroom, since the learning paradigm for students at MATARAM UNDIKMA FSTT was new and the Covid-19 pandemic that demanded distance and wide social levels did not enable lectures to be held on a face to face basis (online learning). Researchers addressed online teaching through Google classrooms in this study. The Google Classroom method for the introduction of online learning requires time to start training. The teacher requests students to provide their information and email address via Google Classroom for the online learning process. This is to encourage teachers to register Google classes so they can train students to interact directly with teachers and peers. The description of the biochemistry material taught includes:

- Structure, properties and chemical reactions of hydrocarbons
- Aerobic and anaerobic metabolism.
- Citric acid cycle.
- Respiration and energy chains (ATP).
- Disorders of carbohydrate metabolism
- Oxidation and energy structures in LIPID
- Metabolism of ketone compounds
- LIPID biosynthesis.
- Structure, properties and reactions of vitamins & minerals

- Genetic knowledge bias and flow in living systems.

3.2. The impact of the OLBGC model on increasing student information literacy ability

The data collected before and after learning online from Google Classroom on student's information literacy shows the effects of calculations with SPSS 23. The average results of preliminary and post-test students are shown in Table 7.

Table 7. Means and Standard Deviations From Students Information Literacy Ability

Group	N	Mean	Std. Deviation	Std. Error Mean
Pretest	65	73	5.60	.989
Posttest	65	77	5.36	.947

Table 6 showed that mean X = 77 in online learning and Mean X = 73 in learning without online. This means that the average student's information literacy ability is greater in online learning than in online learning so that the difference between the arithmetic mean is significant at α Meaning-degree, the accompanying T-test analysis was carried out, and Table 8 shows the results of the analysis.

Table 8. Results of the T-test Analysis on Information Literacy Ability

	Levene's Test for Equality of Variances		T-test for Equality of Means						
	F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Information Literacy	.971	.328	3.2	62	.002	4.34	1.37	1.60	7.08
			3.2	61.8	.002	4.34	1.37	1.60	7.09

The meaning level equal to (0.002) <0.05 can be seen in table 7 which shows a substantial statistical difference of student knowledge literacy before and after learning via Google online. The N-Gain test was performed to assess the increase in student knowledge literacy prior to and after Google Classroom usage and the results of the study in Table 9.

Table 9. Recapitulation Results from N-Gain

No.	Group	N	Ideal score	Value		N-Gain
				Minimum value	Maximum value	
1.	Pretest	60	100	50	60	0.33
2.	Posttest	60	100	60	80	

The student information literacy are improved based on the results shown in table 8. The observed pre-test and post-test levels of N-Gain were in the range of 0.33 with the average category. It has been found in this study that online learning based on Google Classroom is effective in improving students' information literacy ability. This is evidenced by the results of student information literacy online through Google Classroom which is 77 while non online (conventional) is 73. The reason for online learning based on Google classroom is effective in improving students' information literacy skills because it can be done in several ways, namely 1) training intermediate information skills students in obtaining the needed information sources, 2) training students 'basic information skills in using information sources, and 3) training students' advanced abilities in determining valid information sources. The findings obtained are consistent with research carried out by [38], in which the use of technologies like e-text and e-library has made students feel better as they are able to offer successful, innovative and updated submissions. Another research carried out by [39] founded that students who make comprehensive and intensive use of technology appear to adapt learning strategies rapidly with different technical resources to help the learning process. [40] research showed that literacy of knowledge has a positive influence on academic performance. Information literacy can lead to productive activities, including word processing and worksheets, through software and computer programs [41]. [42] describe the results of research on the use of information literacy in different schools, which emphasizes a variety of important points, including giving students room to choose topics,

Title of manuscript is short and clear, implies research results (First Author)

encouraging flexibility in the learning process and growing communication capabilities among students by using modern technologies.

3.3. Student perception of the OLBGC model is implemented

Student learning expectations identify student views on the learning model used during the training phase. Table 10 presents the findings of a student perception study on online learning using Google Classroom.

Table 10. Online Learning Perceptions Students Use Google Classroom

No	Indicator	Statement (%)					Category
		Strongly Agree	Agree	Doubtless	Disagree	Strongly disagree	
1	Want to read	4,2%	46%	29%	12,5%	8,3%	Positive
2	Lecture content easy to understand	4,2%	50%	25%	12,5%	6,25%	Positive
3	Encouraged to learn	4,2%	62,5%	25%	4,2%	0%	Positive
4	Reason for solving the problem	4,2%	68,75%	25%	0%	0%	Positive
5	Recognized and sharing your view	4,2%	75%	4,2%	12,5%	0%	Positive
6	Learn to be autonomous	12,5%	37,5%	31,25%	18,75%	0%	Positive
7	Acknowledgement of others	0%	80%	16,67%	12,5%	0%	Positive
Average							Positive

The data in Table 9 showed that overall experiences of students from Google online are positive. This is seen in the declaration indicators, specifically: Want to read were 46% answered agree; Lecture content easy to understand were 50% answered agree; Encouraged to learn were 62.5% answered agree; Reason for solving the problem were 68.75% answered agree; Recognized and sharing your view were 75% answered agree; Learn to be autonomous were 37.5% answered agree; and Acknowledgement of others from 80% to agree. The results showed that students in Google Online Learning have a positive view because the student experience in online learning is better than without online learning. [43] stated that online learning is an internet network online learning technique. As online learning makes listening to the learning process easier by using Android phones, tablets, or computers rather than only listening to the books an enjoyable learning technique for the students [44]. Students may also become less bored, interested and involved in education by student learning with online learning [45]. Effective and enjoyable learning is based on students to actively engage in the learning process [46]. [47, 48] Online learning may enhance readability, build constructive perspectives, promote class discussions and improve the ability to read and think critically.

4. CONCLUSION

It can be concluded that the Google Classroom Online learning platform (OLBGC) greatly influences students' information literacy capabilities and Google online learning students' expectations in a positive category. This showed that the OLBGC Model is much more effective than traditional learning. This study has an impact on how an efficient learning process can be implemented using Google Classroom, and policymakers can consider this for potential applications of the learning methods that Google Classes will introduce online. Suggestions for the next researcher to conduct similar research to displaying the OLBGC model's learning effectiveness, especially in assessing literacy of information from other learning areas such as various digital literacy.

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