

# Strategy to Improve Literacy Competency 4.0 in Online Collaborative Learning during the Coronavirus Disease Pandemic

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## ABSTRACT

Online learning during the coronavirus disease pandemic has resulted in a decrease in literacy skills by 42%. Besides the creativity of lecturers, the key to the success of online learning is the 4.0 literacy competency which includes data literacy, technology, and human literacy. This study aims to formulate (1) weaknesses, strengths, opportunities, and threats in achieving 4.0 literacy competency, and (2) an effective 4.0 literacy competency improvement strategy in online collaborative learning. This study is qualitative research using the SWOT analysis method for data analysis. The research subjects are mechanical engineering vocational education students at the Universitas Sarjanawiyata Tamansiswa and students from the State University of Yogyakarta in Mechanical Engineering. The instrument used is a questionnaire. The results showed that the students' data literacy skills were quite good. Meanwhile, technology skills are in a good category, and human skills are in a good category. 4.0 literacy competencies can be improved by paying attention to strength analysis to take advantage of opportunities, minimize weaknesses to take advantage of opportunities, take advantage of strengths to overcome threats, and minimize weaknesses to avoid threats and strengthen the quality of collaboration between agencies.

**Keywords:** *literacy, competence, SWOT analysis*

## 1. INTRODUCTION

The coronavirus disease (covid-19) pandemic has had an impact on the learning system in Indonesia with online learning trends being the safest alternative during this outbreak. However, online learning in universities also has weaknesses in addition to advantages, including internet network constraints, wasteful and expensive internet quotas, the demands of educators in providing online learning media that are creative, innovative, interactive, and virtual reality-oriented, requiring skill and time. The use of technology as a learning tool becomes more optimal. This is in line with the 4.0 era which was marked by the massive use of internet technology in all dimensions of life, including in the world of education. Through online learning, students are required to have new literacy skills (Danim, S: 2019) focused on three main literacys, namely (1) data literacy which aims to increase selective ability to information in the digital world, (2) technological literacy aims to involve science and applications. technology, (3) human literacy aims to improve communication.

The results of the 2018 PISA (Program for International Student Assessment) released by the OECD show that Indonesian students have reading, math, and science skills below the OECD average. The average National Alibaca Index is in the category of low literacy activity, which is at 37.32, the Proficiency Dimension Index is 75.92; Access Dimension Index of 23.09; Alternative Dimension Index of 40.49; and the Cultural Dimension Index of 28.50 (Kemendikbud: 2019). With low literacy skills, it is inversely proportional to the large number of students who access the internet, which is approximately 70 million people. Thus it can be concluded that the ability to access high technology applications but data literacy and understanding of technology processes/works as well as communication literacy is still lacking. Indicators of the lack of new literacy competencies can be seen from many student assignments that are plagiarized and not in accordance with orders, some students have difficulty communicating the results of the analysis from online media related to how machines work etc. Sarjanawiyata University is an institution that is highly committed to carrying out Ki

Hadjar Dewantara's teachings regarding free learning, while Yogyakarta State University is one of the independent campuses in the country and implements an independent learning curriculum. The collaboration of online learning between universities with their respective advantages in line with the Ministry of Education and Culture's independent learning policy is expected to produce superior and competitive graduates. Therefore, the formulation of an online collaborative learning strategy that is oriented towards increasing students' new literacy competencies needs to be carried out immediately through collaborative research between universities.

The demands of the Industrial Revolution Era 4.0 are not enough Old Literacy (reading, writing, and mathematics) as the basic capital to take part in society. Therefore, to be able to produce competitive graduates, New Literacy skills are needed. Aoun (2017) mentions New Literacy facing the era of the industrial revolution 4.0 including: (1) Data Literacy, ability to read, analyze and use information (Big Data) in the digital world; (2) Technology Literacy, understand how technology application machines work (Coding, Artificial Intelligence, and Engineering Principles); (3) Human Literacy, humanities, communication and design. Human literacy is a part of General Education that must be mastered by students. Meanwhile, data literacy and technology can be applied in elective courses.

Online learning or distance learning is an alternative learning model during the coronavirus disease era. The online learning system in Indonesia by the Directorate General of Belmawa is facilitated through the Spada Indonesia system <http://siswadaring.ristekdikti.go.id>. The implementation of Spada since 2017 provides open materials, open lecture materials, online lecture materials from organizing universities and partner universities on the Spada NGO website (Ahmad, I: 2018). Through this LMS facility, students can access a variety of materials with various digital media. In addition, online learning collaboration in the independent curriculum policy is a new learning alternative that can strengthen student competencies.

The new literacy strategy in learning is how to teach content that can build students' understanding of reading skills, analysis, using digital information, writing or creating/designing skills and overall communication skills. Learning characters that apply literacy strategies can be applied in cooperative, text-based, project-based, problem-based, inquiry, discovery, and scientific learning according to the characteristics of the subjects and their competency achievements. Learning that applies literacy strategies can develop metacognitive abilities such as (1) monitoring text comprehension, (2) the use of various modes (multimodal literacy) during learning, (3) clear and explicit instructions, use of tools such as graphic design, animation, checklists, (4) responses to various types of questions, (5) making questions, (6) analysis, synthesis, and evaluation of the text, (8) summarizing the content of the text (Beers: 2010, Greenleaff et al: 2011). Relevant research studies related to literacy competencies from 2016-2019, namely Tavdgiridze, I (2016) examined the literacy competencies needed in learning in modern schools or universities, namely the development of reading and writing competencies. Then the research of Ibda, H. (2019) concluded that strengthening new literacy (data literacy, technology and human resources) for PBSI students can be done through distance/online learning with the condition that the lecturers master digital, creative, critical and online-based competencies. More Mulistrini, K.E. (2019) emphasized that strengthening new literacy competencies for teachers can be done through curriculum revitalization, strengthening technological competencies and collaboration with educational institutions. Given the importance of new literacy competencies (literacy 4.0), Dianna et al in 2020 will carry out research to find effective strategies in improving literacy 4.0 competencies for students through online collaborative learning between universities to build more competitive students.

## 2. METHODS

This type of research is a qualitative research using the SWOT method for data analysis. SWOT analysis can be used to identify and analyze the strengths and weaknesses of a project, organization or institution, as well as opportunities and threats from the external environment. Further David, F.R. (2015) explains that SWOT analysis can help determine strategic choices where this is the most effective and objective way to determine how a company/organization is able to survive when facing threats and taking advantage of opportunities. To find an effective strategy, in the process of analysis the SWOT method.

The research subjects were Mechanical Engineering Education students at Sarjanawiyata Tamansiswa University with Mechanical Engineering Education students at Yogyakarta State University. Meanwhile, the expert judgment team for formulating a strategy to increase literacy competency 4.0 in online collaborative

learning involved lecturers at the University of Sarjanawiyata Tamansiswa and PTK lecturers at Yogyakarta State University.

The instrument in this study was a questionnaire filled out by students and the expert judgment team. The qualitative data analysis technique uses the model from Miles and Hubberman (Sugiono, 2010) which includes the stages of data collection, data reduction, data presentation, as well as drawing conclusions and verification.

### 3. RESULTS AND DISCUSSION

#### *SWOT Analysis Findings:*

##### (1) Strengths

Able to take advantage of various online learning tools such as google meet, zoom, ust portal, sipedar, google classroom, be smart, website, virtual learning tools, simulation using software/simulator as a substitute for good practice and insight, learning videos, ppt, whatsapp, video conference; there are supporting facilities such as laptops and pcs, smartphones; data literacy resources can be accessed quickly; signal support; data analysis skills for easy understanding; obtaining data package subsidies from the government; willingness to learn digital information is high; data accuracy; high curiosity; references can be accessed from anywhere and anytime; data can be obtained from a wide variety of sources; able to explore data independently; able to take advantage of technology to make it easier to use the latest technology to be efficient at work; ability to understand how the machine works; ability to operate applications and online learning sites; able to apply learning with the technology used; have motivation and innovation for the spirit of learning

##### (2) Weaknesses

Unstable signal, unclear explanation, many tasks; limited quota; can't practice directly, theory dominates; schedule changes; more difficult to understand through online learning; frequent power cuts; don't have laptop facility yet; it's more difficult to have online discussions; internet data package subsidies from the ministry of education and culture are not smooth when used. (a) weaknesses of data literacy: difficulty understanding references from online sources; submission of material online is difficult to understand; difficult to find references online; difficulty finding the best reference sources; lack of interest in reading; many reference sources are not valid; difficulty downloading new references; many encounter unclear and incomplete data sources; the number of foreign references while the ability to speak english is limited; the difference in the data literacy ability of each person; lack of online references; difficulty understanding and analyzing new things; difficulty analyzing data from various sources on the internet; lack of references from other sources (based on only one reliable source); (b) weaknesses of technological literacy: quota and internet network; disadvantages of operating online applications; not familiar with online learning sites; laptops; limited technology/facilities owned in supporting online learning; data accuracy; less than optimal in the use of technology features; not up to date with technological developments; not completely able to avoid the dangers of the internet/online; technology/system often error; difficulty in understanding virtual machines compared to live use; lack of technology references; there are no tools so you can't apply directly; lack of confidence in the face of technological sophistication; (c) weaknesses of human literacy: difficult during the pandemic for group work and socialization; lack of critical thinking and lack of communication; lack of socialization to the environment; difficult to communicate and convey; short literacy focus time constraints; lack of self-confidence; laziness and procrastination; reduce direct communication so that problem solving discussions are reduced; the many influences of globalization that interfere with the spirit of student learning; online communication cannot be conveyed clearly; lack of public speaking skills

##### (3) Opportunities

Ease of finding online literacy; desire to learn technology; sources of information can be obtained quickly and effectively; the learning process in exploring technology can be done anywhere and anytime; have initial stock in information and technology knowledge; advances in technology make it easier to communicate and convey ideas to others; data literacy skills can be self-taught; internet network; technological sophistication can facilitate the implementation of the online learning process; there is support from the government in completing online learning facilities and infrastructure; various learning methods; complete facilities from the institution; various and effective online learning models; lectures are more flexible and can be done anytime and anywhere; external students can attend cross-institutional lectures anytime and anywhere; creating world class university

opportunities by implementing an online system with a cross-institutional cooperation system; it-based learning method 4.0

#### (4) Threats

Smooth signal access varies from region to region; economic gap for purchasing data packages; economic instability; awareness of attitudes and attitudes in online learning; weak interest in online learning; limited technological literacy skills related to tool operating procedures; learning facilities owned by students are uneven/different; diversity of students' independent literacy skills; underestimating participation in online learning

#### *Findings of Student Literacy Competence*

Based on the results of filling out a questionnaire by 50 respondents via google form on the page [https://docs.google.com/forms/d/e/1FAIpQLSdSd3F-fxuePIU6NtoGB9qF8q42aWco\\_N3vAYe77zrAp6VZqg/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSdSd3F-fxuePIU6NtoGB9qF8q42aWco_N3vAYe77zrAp6VZqg/viewform?usp=sf_link) , the findings were obtained

#### (1) Quality of Student Literacy Competence

Literacy competencies that include data literacy, technological literacy and human literacy are included in the good category with the following data

**Table 1. The results of the average literacy competence of students**

No.	Respondents	Average Literacy Competence of Students of Mechanical Engineering Education Study Program UST and UNY	Category
1.	50	29	Good

**Table 2. Literacy competency criteria**

Category	Range
Very good	37 - 44
Good	28 - 36
Enough	19 - 27
Not good	11 - 18

**Table 3. Quality of data literacy competence**

No.	Respondent	Average Literacy Competence of Students of Mechanical Engineering Education Study Program UST and UNY	Category
1.	50	13	Enough

**Table 4. Data literacy competency criteria**

Category	Range
Very Good	20 - 25
Good	15 - 19
Enough	10 - 14
Not good	5 - 9

**Table 5. Quality of technological literacy competence**

No.	Respondent	Average Literacy Competence of Students of Mechanical Engineering Education Study Program UST and UNY	Category
1.	50	6	Good

**Table 6. Technological literacy competency criteria**

Category	Range
Very Good	8 - 9
Good	6 - 7
Enough	4 - 5
Not Good	2- 3

**Table 7. Quality of human literacy competence**

No.	Respondent	Average Literacy Competence of Students of Mechanical Engineering Education Study Program UST and UNY	Category
1.	50	10	Good

**Table 8. Criteria for human literacy competence**

Category	Range
Very Good	13 - 16
Good	10 - 12
Enough	7 - 9
Not Good	4 - 6

**SWOT STRATEGY****(1) Strengths-Opportunities Strategy**

Utilize electronic facilities (laptops and smartphones) to continue to learn to use technology to access data/references to create the widest possible knowledge whenever and wherever); utilizing data package assistance from the government and agencies for positive learning activities and deepening of science and technology; increase the duration of the learning process through various internet technology platforms at optimal/stable internet signal times; apply interactive and varied online learning models and methods to improve student literacy skills; utilize technology literacy skills to improve data literacy, technology literacy and human literacy skills

**(2) Weakness-Opportunities Strategi Strategy**

Utilizing online learning media platforms with minimal quotas for the implementation of teaching and learning activities; applying effective online learning methods to develop or improve student literacy skills; utilize internet quota subsidies with the most ideal/stable speed as teaching and learning activities; archive data/videos of online learning to be uploaded to YouTube so that they can be accessed at any time and can be repeated at any time by any student, both those who are constrained by signal and those who are not constrained by the network; perform time management ideally and consistently for teaching and learning activities, and minimize sudden schedule changes. However, if forced to replace the previous meeting, it can be coordinated according to mutual agreement

**(3) Strengths-Threats Strategi Strategy**

Uphold discipline in online learning through rules for participation during online learning that must be obeyed; applying diverse learning methods and using various types of innovative online learning media; using online learning media that can be accessed by laptops and cellphones to the fullest; strive to use quota-efficient online learning media.

**(4) Weakness-Threats Strategi Strategy**

Providing additional quota subsidies for underprivileged families; increase online discussions to hone literacy skills; increase the sharing of accessible, free, and valid literacy resources; implementing an independent learning model for cross-institutional learning with similar study programs to improve data literacy, technological literacy, and human literacy skills.

#### **4. CONCLUSION**

4.0 literacy competencies of students still require continuous development, namely both data literacy skills, technological literacy and human literacy can be improved through the application of a SWOT strategy by paying attention to strength analysis to take advantage of opportunities, minimize weaknesses to take advantage of opportunities, take advantage of strengths to overcome threats, and minimize weaknesses. and avoid threats.

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