Analysis of Economics Mathematics Literacy and Numeracy in Supporting the Implementation of Distance Learning

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ABSTRACT

Starting from the condition of the country being hit by the problem of the covid-19 pandemic which had a big impact on the world of education in the process of implementing learning which at first we did it face-to-face directly and now we carry out the distance learning process through mobile phones, computers, or other technological devices which we call this learning model online learning. Basically, when doing learning it should have an impact on literacy and numeracy skills in particular, but with the current learning conditions it results in not achieving numeracy literacy skills due to many shortcomings, including (1) Using various kinds of numbers and symbols related to mathematics to solve economic problems in various contexts of everyday life, (2) analyze the information displayed in various forms (graphs, tables, charts, etc.) and then use the interpretation of the results of the analysis to predict and make decisions in the economic field, (3) does not clearly understand numeracy literacy skills, their uses, and their application in various contexts. Literacy and numeracy skills are very necessary for every student because these two abilities can prepare us to live in society and in the world of work.

Keywords: Literacy, Numeracy, Economics, Mathematics.

1. INTRODUCTION

Since the beginning of March 2020, it was announced that our country was in a disaster of finding the first case of Coronavirus Disease 2019 (Covid-19) in Indonesia. Since then, almost all sectors of life have been paralyzed, including education. The Ministry of Education and Culture (Kemendikbud) then responded to this condition by making a number of policies. Starting from the Ministry of Education and Culture's budget allocation for handling the spread of Covid-19 in the form of providing information, handling the slowdown in Covid-19 transmission, learning related to Covid-19, how to handle it and so on. The next month, April 2020, the Ministry of Education and Culture also broadcast the Learning From Home (Belajar Dari Rumah (BDR)) program broadcast by TVRI. This program is filled with various educational and fun shows as an alternative learning for students, parents, and teachers. This is all done as a precaution against the Covid-19 pandemic (Kemendikbud, 2020).

A great nation is characterized by a literate society, which has a high civilization and is actively advancing world civilization, a nation with a high literacy culture is able to collaborate, think critically, be creative, and communicative so that it can show the capabilities of its nation. Since 2016 the Ministry of Education and Culture has activated the National Literacy Movement (Gerakan Literasi Nasional (GLN)) as part of the implementation of the Minister of Education and Culture Regulation Number 23 of 2015 concerning the growth of character (Budi Pekerti).

The educational process that we are currently doing is incorporating technological devices into the learning process where in this distance learning process many skills that must be possessed by students cannot be conveyed to students, such as literacy and numeracy which have a role in changing education. With numeracy literacy, we become citizens who are ready to face the challenges of the 21st century. A similar statement was also made by Suminar (2019) Technology it self has

gained many places in our lives, not just a matter of globalization but because of the impact and benefits that make most people addicted to its practice.

Numerical literacy is the knowledge and ability to (a) Use a variety of numbers and symbols related to basic mathematics to solve practical problems in various contexts of everyday life and (b) Analyze information presented in various forms (graphs, tables, charts, etc.). Numeration can be defined as the ability to apply number concepts and arithmetic operations skills in everyday life (for example, at home, work, and participation in community life and as citizensz (Kemendikbud, 2017). From this explanation, it can be stated that numeracy and mathematical literacy are two different things, both based on the same knowledge and skills but the difference lies in the empowerment of knowledge and skills. Furthermore, Abdillah (2021) said that literacy and numeracy are very much needed, among othersliteracy is a person's level of understanding in drawing conclusions from the information received for the better, Helping people think critically, not reacting too quickly, Helping to increase people's knowledge by reading, Helping to grow and develop good character values in a person.

Numerical literacy is needed in all aspects, especially in the learning process and this has a huge impact on society, the nation and the state. Numerical literacy skills make a real contribution to social, economic and welfare growth for individuals or communities. By having a population that can apply mathematical understanding in the context of economics, engineering, science, social and other fields, employment competitiveness and economic prosperity will increase. This opinion is supported by the statement of Mahmud (2019) To have good numeracy literacy skills, students must be able to think and communicate quantitatively, to understand data, to have spatial awareness, to understand patterns and sequences, and to recognize situations where mathematical reasoning can be used. applied to solve the problem.

From the presentation, it appears that numeracy literacy is an ability and knowledge that must be possessed by students because these two abilities can prepare students to be able to live and compete with others both in the community and in the work environment in facing challenges in the future. Kuswidi (2015) also this implies that mathematical literacy is not only in the assignment of material but also helps someone to understand the role and usefulness of mathematics in everyday life while using it to make the right decisions as citizens who build, care and think.

In this case, numeracy literacy can be applied in economic mathematics learning where mathematical material such as numbers, linear functions, matrices and others can be solved easily by students but to apply it in economics such as analyzing, predicting and making decisions in the context of economics in the student

community still weak in this case it appears that students do not yet have the ability in terms of Numerical Literacy, one of which is through mathematical calculations, mathematical symbols to interpret and apply them in the economic field, such as the calculation of linear equations that can predict or estimate between market supply and demand, predict profits through capital and sale of goods,this is a small example of still weak ability in numeracy literacy in economic mathematics learning, in other words Sina (2012) argues that increasing mastery of economic literacy is non-negotiable but a necessity and all of that can be started from a continuous desire to learn.

With the current learning situation caused by the COVID-19 pandemic forcing us to carry out distance learning processes, the importance of numeracy literacy for students, especially in learning economics mathematics or other lessons, outsiders do not really understand the need for numeracy literacy, especially in learning. For the success of numeracy literacy, a main and consistent strategy is needed to support the development of numeracy literacy through the application of mathematical knowledge in other fields, using mathematics across the curriculum, contributing to broaden and deepening understanding of numeracy literacy and applying it in real life directly. This statement is supported by Siskawati (2021) Numerical literacy ability is the ability to effectively collaborate mathematical knowledge and understanding in dealing with the challenges of everyday life by (1) using a variety of numbers and symbols related to basic mathematics to solve problems in various contexts of everyday life, (2) analyze the information displayed in various forms (graphs, tables, charts, etc.) and then (3) use the interpretation of the results of the analysis to predict and make decisions. Then for the indicators used in measuring numeracy literacy skills, namely (1) communication skills; (2) mathematical ability; (3) representation ability; (4) reasoning and argumentation skills; (5) the ability to choose strategies to solve problems; (6) ability to use language and symbolic, formal and technical operations; (7) the ability to use mathematical tools in more detail. With thus, the problems raised previously will be studied in depth related to the analysis of numeracy literacy skills in the Mathematics Economics course to support distance learning.

2. METHOD

To achieve the expected goals, this type of research uses a descriptive qualitative approach to be able to describe data related to students' abilities in solving economic math problems in distance learning. With the problem that many students are less able to recognize symbols in the economic field, unable to analyze the results of mathematical calculations in the economic field

or display them in graphic form, plus students do not really understand what is meant by numeracy literacy itself. The data collection method is the documentation method with instruments in the form of hard or soft files, with a research sample of 100 students taking the Mathematics Economics course, students are asked to solve 2 math problems to be analyzed in the economic field, the results of student work answers are then analyzed based on the following numerical indicators:
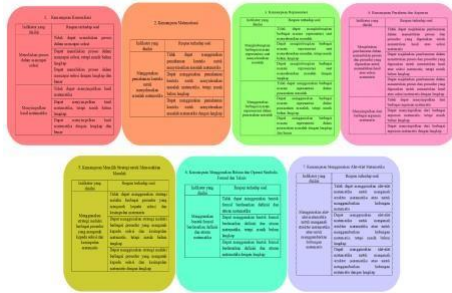

Figure 1. OECD Numerical Literacy Ability Indicators

The stages of the process to be carried out in this research are as shown in the following research flow chart:
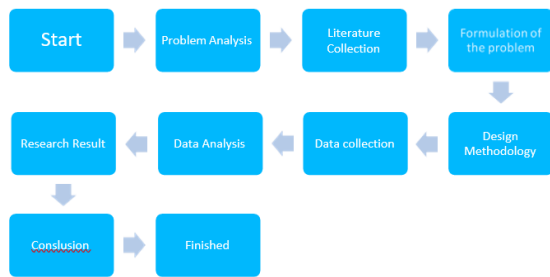

Figure 2. Research Flowchart

3. RESULT AND DISCUSSION

The results of the research and analysis of questionnaire data where the questionnaire in this study is divided into two parts, namely the first about the extent to which students can understand the meaning of numeracy literacy and the second is about numeracy literacy problems in economic mathematics. Based on the results of a research questionnaire from 98 third semester students who were taken randomly, it was stated that 32.65% or 32 students knew about numeracy literacy, 58.16% or 57 students said maybe or hesitated and only 9.18% or 9 students said they did not know numeracy literacy. Students who answered maybe or hesitated because they had heard and read only briefly but did not understand clearly about numeracy literacy.
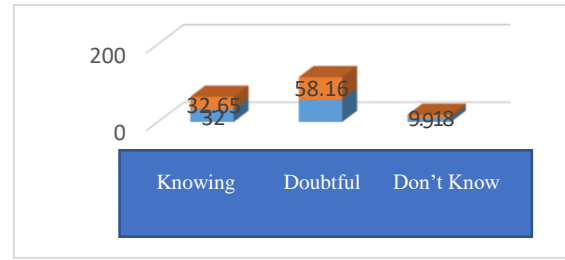

Figure 3. Students' Numerical Literacy Knowledge

As many as 15 or 15.31% of students said that they got numeracy literacy information from journals or articles. 54 or 55.10% of students received information on numeracy literacy from social media, 25 or 25.51% of students received information on numeracy literacy from seminars/webinars and the remaining 4 or 4.08% of students received information on numeracy literacy from other sources.
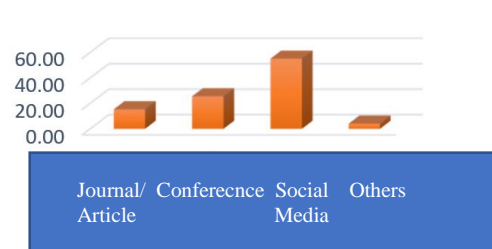

Figure 4. Sources of Student Numerical Literacy Information

The next survey question related to the definition of numeracy, there were 10 or 10.20% of students who answered correctly the definition of numeracy literacy and as many as 88 or 89.80% of students answered incorrectly. At least the correct answers from students because they do not fully understand about numeracy literacy. This also happens because the term numeracy literacy is a new thing for students.
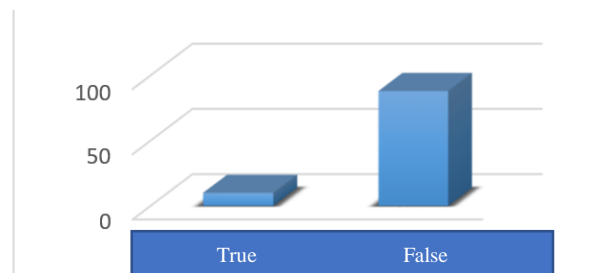

Figure 5. Student Knowledge Related to Numerical Literacy

The following will be tested on economic mathematics numeracy literacy questions to 100 students who are taking economics mathematics courses, questions such as those in the following
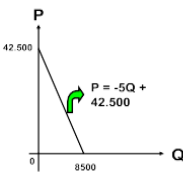
No	Pernyataan	Benar	Salah
1	Apakah soal Literasi Numerasi selalu dalam bentuk soal cerita	58%	42%
2	Tentukanlah kesimbangan Pasar barang A, jika diketahui persamaan permintaan Qd = 100-P , dan persamaan penawarannya Qs= -10 + P , Apakah soal tersebut termasuk kedalam soal literasi Numerasi?	56%	44%
3	Permintaan terhadap suatu barang yang terjadi di pasar adalah bila diminta 20 unit barang, harga per unit barang Rp 80 dan bila diminta 60 unit barang, harga menjadi Rp 40, sedangkan penawaran yang terjadi adalah jika yang ditawarkan 90 unit barang harga per unit Rp 40, tetapi jika ditawarkan 120 unit barang harga akan naik menjadi Rp 60 per unit. Apakah soal tersebut termasuk kedalam soal literasi numerasi?	74%	26%
4	Dari grafik permintaan dapat di lihat bahwasanya jika harga suatu barang Rp. 42.500 maka permintaan akan barang tersebut sebanyak 8.500 buah, pernyataan ini apakah merupakan kemampuan literasi numerasi?	54%	46%
5	Jika fungsi permintaan adalah P = 20 – Q dan fungsi penawaran adalah P = 6 + 2Q. Berapakah jumlah produk yang diminta dan ditawarkan pada tingkat harga Rp. 10 perunit? fungsi permintaan: P = 20 – Q Qd = 20 – P Qd = 20 – 10 Q = 10 Jadi jumlah produk yang diminta pada tingkat harga Rp. 10 adalah sebanyak 10 unit. fungsi penawaran : P = 6 + 2Q 2Q = -6 + P Q = -3 + 0.5 P Q = -3 + 0.5 (10) Q = -3 + 5 Q = 2 Jadi jumlah produk yang ditawarkan pada tingkat harga Rp. 10 adalah sebanyak 2 unit Apakah menghitung jumlah permintaan dan penawaran dengan menggunakan simbol permintaan dan penawaran merupakan kemampuan literasi numerasi?	53%	47%

Figure 6. Economic Mathematics Numerical Literacy Questions

From the analysis of the results of student answers to the first question, it can be interpreted that most students think that the numeracy literacy question is a story problem. It can be seen that 58% answered correctly and 42% answered incorrectly. So it can be estimated that most students discuss economic math problems in the form of story questions based on economic problems, from this students' thoughts are formed that numeracy literacy questions are in the form of story questions. The second question is a linear equation problem whose introduction is made as if it is in the form of a story question but is not a story problem, here it can be seen that there are still many students who cannot recognize economic symbols related to mathematics that can solve problems in various economic contexts, as seen from the results of the answers as many as 56% of students answered correctly and 44% of students answered incorrectly.

The next analysis for question number three is a matter of adaptation of mathematical economics numeracy literacy questions and most students consider the problem to be a story problem that describes linear equations in mathematics and uses the symbols of demand and supply in economics, most students understand it if the question is a question numeracy literacy based on 74% gave the correct answer and 26% gave the wrong answer. Likewise with the fourth question here, it appears that 54% gave correct answers and 46% gave wrong answers, from the results of these answers there are still many who have not been able to narrate the graphs presented in economic

problems, because almost 50% of students still do not understand the symbols and formulas of demand and supply in economics, therefore students find its difficult to draw conclusions in economics. The same thing that was found in the fifth question of 53% gave the correct answer and 47% gave the wrong answer, assuming the reason was the same as the previous question.

From the results of the data analysis above, the average value of the correct answer is 59% and the wrong answer is 41% this has a significant relationship between the low knowledge of numeracy literacy with economic mathematics numeracy literacy questions. The results of the analysis show that it is necessary to provide knowledge related to numeracy literacy in learning and the provision of student projects that contain numeracy literacy, especially in economic mathematics learning, both as economic actors themselves and in the learning process so that they can better support distance learning so that the hope is to increase literacy knowledge student numeration.

5. CONCLUSION

The results of the study that students' knowledge of numeracy literacy was low enough to have a significant relationship with the economic mathematics numeracy literacy questions tested, 42% of students did not understand the meaning of numeracy literacy, especially economic mathematics and it was seen that 54% of students gave correct answers and 46% of students gave wrong answers to literacy questions. The numeration tested means that it can be assumed that there are still many who have not been able to narrate the graph of linear equations in economic problems, almost 50% of students do not understand the symbols and formulas of demand and supply, therefore students find it difficult to apply mathematics in economics. It is necessary to study further about students' knowledge of numeracy literacy, especially in learning economics mathematics because there is still very little research on numeracy literacy whose application in life has an impact on the world of work and society.

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