



The influence of literacy and numeracy learning in IPS subjects on students' 21st-century skills

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ABSTRACT

This research contributes to describing the effect of literacy and numeracy learning on social studies subjects in schools and looks at how it affects 21st-century skills. This research was conducted at SMP Negeri 2 Cikupa. Based on existing theories, it is known that this research hypothesizes that learning literacy and numeracy in social studies subjects can develop students' 21st-century skills. This study used a population of all SMP Negeri 2 Cikupa, which amounted to 1165 students in grades 7, 8, and 9. The samples used just two classes of 9G and 9H classes. The sample was selected through simple random sampling because the population is included in the homogeneous category. The method used is quantitative, with the independent variable X1 literacy, X2 numeracy, and the dependent variable Y1 21st century skills. The data analysis technique was carried out by dividing the research subjects into the experimental and control classes, each being tested with a pretest, posttest, data prerequisites, hypothesis testing T, F, and determinant coefficients. This study concludes that the literacy variable, numeracy, influences 21st-century skills, as evidenced by the results of the literacy T-test on 21st-century skills, which shows that $t \text{ count } 4.676 > t \text{ table } 2.042$ and $\text{sig. } 0.000 < 0.05$ and numeration on 21st century skills $t \text{ count } 3,527 > t \text{ table } 2.042$ and $\text{sig. } 0.001 < 0.05$.

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INTRODUCTION

The purpose of national education is to develop students' potential to become people who are faithful and devoted to God Almighty, have noble character, are healthy, knowledgeable, capable, creative, and independent, and become good and responsible citizens so that they can carry out democratic ideas following the goals and ideals of the founding of this nation (Rohim, 2021). Based on these objectives, several government policies were carried out. In this case, the National Exam (UN) was replaced with a minimum competency assessment (AKM) based on numeracy literacy and character surveys (Andiani et al., 2020; Hasanah & Hakim, 2021).

At the operational level of the policy, teachers need to fully understand and have sufficient competence regarding the implementation of assessments in the form of literacy and numeracy (Anas et al., 2021). Based on research conducted by Fauziah et al. (2021) they were entitled "Analysis of Junior High School Teachers' Understanding of Minimum Competency Assessment (AKM)" with the aim of research to analyze the understanding of Junior High School teachers in understanding

Minimum Competency Assessment (AKM) shows that literacy and numeracy-based minimum competency assessments need to be socialized more to teachers.

Literacy numeracy is the ability to use various kinds of information in the form of numbers and symbols related to anything to solve practical problems in everyday life (Nadjamuddin & Hulukati, 2022; Perdana & Suswandari, 2021). Numeracy literacy is defined as the ability to apply numerical concepts and skills, as well as the ability to interpret arithmetic operations in daily life and quantitative information in the student's environment (Rosa & Orey, 2015). Numeracy literacy is also a person's ability to use various numbers and symbols to solve computational power, practical problems, and various data presented in the form of graphs, tables, charts, or images (Ojose, 2011). Then, it is used to interpret the results to make predictions and decisions (Patriana et al., 2021).

Rapid technological development and professional needs demand higher and different skills in each individual. Learners are required to be able to understand knowledge not only conceptually, but also to be able to understand it critically and creatively in solving a problem and also master the six basic literacies in order to increase competitiveness in facing challenges in the 21st century. Therefore, in the 21st century, learners are required to be able to think critically, creatively, innovatively, and collaborate with each other (Urbani et al., 2017). Furthermore, students must also be able to adapt to the times by mastering six basic literacies, of course, to increase competitiveness in facing the challenges of the 21st century, namely reading and writing literacy, numeracy literacy, science literacy, digital literacy, financial literacy, and cultural and civic literacy (Anderha & Maskar, 2021; Nudiati & Sudiapermana, 2020).

At the time of writing this research article, students are faced with the need for global competencies where they can think critically in solving problems, creative or innovative, able to communicate, and able to collaborate with anyone (Kabul et al., 2023). The minimum competency assessment implemented by the government wants to prepare students to be part of the government's target in welcoming the 21st century with various skills that must be achieved. These skills are contained in four competencies abbreviated as 4C, namely critical thinking and problem solving (students can think critically and be able to solve problems), creativity (students have creativity), communication (students can communicate), and the ability to work together and collaborate (students can work together) (Andiani et al., 2020).

The 21st century has significantly transformed education by collecting data through games, higher coordination that reflects shared decisions, trust, and individual decision-making (Hernandez-Aguilera et al., 2020). Based on the explanation above, we know that the world is developing so fast that the needs and abilities have also changed. One of what is needed today is 21st-century skills by encouraging social studies learning to be directed towards it, namely by learning methods that prioritize training in the form of literacy and numeracy so that there is great hope that it will create a society that behaves well or good governance and can compete with the challenges of changing times. Creating a society that behaves well or has good governance and can compete with the challenges of changing times. However, whether the ability to learn literacy and numeracy encourages students to be ready to face the challenges of world change is still a question. Therefore, researchers want to examine in more depth every link that occurs from the background of the problem above.

METHOD

This research uses quantitative methods. The quantitative research process uses theory to formulate hypotheses to answer problems. The hypothesis is then tested with field data and uses survey tools to collect the data. The collected data is analyzed quantitatively using the SPSS statistical calculation application to conclude whether the hypothesis has been proven (Sugiyono, 2013).

Researchers try to design as well as possible to maximize the results obtained. This research design is as follows: (1) Dividing the research subjects into control and experimental classes; (2) The control class is left without any intervention on the independent variable; (3) The experimental class experienced the intervention of the independent variable, namely by teaching in more depth literacy (X1) and numeracy (X2) in social studies subjects; (4) Carry out a posttest on the subjects of the

control class and experimental classes' subjects; (5) Looking for differences in average results between the two classes; and (6) Survey the experimental class.

This research was conducted at State Junior High School 2 Cikupa, Tangerang Regency, from March 2022 to October 2022. The population of respondents taken was students of SMP Negeri 2 Cikupa, totaling 1165 students consisting of 7th, 8th, and 9th-grade students. Then, the researchers focused on the 8th-grade population only, with a student population of around 400, because at this level, the respondents had a strong enough relationship with the theoretical study being studied. The researchers' sample was to use only two classes from 10 classes in grade 9, namely classes 9G and 9H, with 43 students in class 9G (control class) and 44 in class 9H. The data analysis carried out uses data prerequisite tests such as validity, reliability, normality, homogeneity, and hypothesis tests such as T, F, and coefficient of determination.

RESULT AND DISCUSSION

Education is a process of thinking, growing, and developing that every human being does from birth to the end of life, intending to try to become the best human being according to his version in preserving his life. Etymologically, education comes from the Greek pedagogy, which means guiding children, *paie* means child and *ago* means guiding. At the same time, someone in charge of guiding a child is called a *paedagogo* (Anshory & Utami, 2018). Social education or social studies education is an educational program, not a subdiscipline that stands alone, so it is not contained in the philosophy of science, the field of social sciences, or the study of educational sciences. This shows that social studies takes an integrated perspective of various subjects such as geography, economics, politics, law, history, anthropology, psychology, and sociology (Gunawan, 2021).

Social studies education in Indonesia was first used in 1960 but with a traditional approach, while other social sciences such as history, geography, and economics are still applied separately. In 1972, the Research Agency for the Development of Education and Culture (BP3K) finally agreed to combine social science lessons such as history, geography, economics, etc. This further standardized its name into social studies in 1975. When talking about social studies in the context of the times in the era of globalization today, digital literacy becomes one of the supporters to develop students' knowledge of social issues that arise in society in real-time. This also follows the concept of social studies learning that focuses on human life (Gunawan, 2021). Critical literacy in social studies describes an approach to reading education that focuses on the political, socio-cultural, historical, and economic forces that shape young students' lives. It is an approach that teaches readers to be critically aware of their values and responsibilities in society (Soares & Wood, 2010).

Literacy is reading skills and the intellectual ability to read and understand a concept (Galatea et al., 2022). We can define numeracy literacy as the knowledge and ability to use numbers and different symbols in various contexts to solve practical problems in different daily life contexts. It analyzes information in different formats (graphs, tables, charts, etc.) and interprets the results to make predictions and decisions. Arithmetic is simply the ability to apply numerical concepts and math skills in everyday life. For example, at home, work, community living, and participating as a citizen. Alternatively, the ability to interpret quantitative information around us. This ability is demonstrated by being fluent in numbers and being able actually to apply math skills to meet the demands of life. This skill also involves understanding and comprehending mathematically expressed information such as graphs, charts, and tables (Anas et al., 2021).

Visual literacy understanding involves people's ability to see, interpret, and give meaning to images and other visual objects in the world around them. Visual literacy encompasses a wide range of cognitive skills ranging from simple recognition to complex skills that require interpretation, analysis, and the creation of personal meaning. Visual literacy skills are becoming increasingly important, especially in digital communication and everyday social media, where people are bombarded with images, photos, graphics, videos, and icons daily (Cruz & Ellerbrock, 2015).

Teaching in the 21st century has a different perspective. Learning happens anywhere, anytime, on any subject that helps students with various learning styles. Great students are the result of great teachers. Many factors influence student achievement, such as the most important influencer being an inspiring and experienced teacher (Jan, 2017).

Learning 21st-century skills allows for technology-based learning that is developing rapidly. This technological development facilitates various developments, including the field of evaluation. For example, traditional evaluations that usually use paper can be replaced by technology. While learning in the 21st century has its characteristics and uniqueness, an educational institution must focus on 21st-century skills. Learning must be designed following 4C skills, including (1) critical thinking and problem-solving skills, (2) creative and innovative thinking skills, (3) communication skills communication skills, and (4) collaboration skills and cooperation skills (Rosnaeni, 2021).

For 21st-century learning to work well, it must fulfill several conditions that must be met: positive interdependence, supportive interactions, personal and group responsibility, social skills, and cooperation in groups (Laal et al., 2012). Furthermore, the use of effective and structured collaborative learning in the classroom can have strong implications for the success of student learning (Sulaiman & Shahrill, 2015).

Based on existing theories, it is known that the hypothesis of this study is that literacy and numeracy learning in social studies subjects has an impact on developing 21st-century skills. Based on the theoretical review and framework prepared, the hypotheses proposed in this study are: (Ha) there is a significant influence in the implementation of literacy and numeracy learning in social studies subjects on 21st-century skills of students at SMP Negeri 2 Cikupa. (Ho) There is no significant influence in implementing literacy and numeracy learning in social studies subjects on students' 21st-century skills at SMP Negeri 2 Cikupa.

Based on the observation at the research site, it is known that SMP Negeri 2 Cikupa was established on August 1, 2005, with NSPN 20613564. This school has an establishment decree number of 421/Kep.240-Huk/2005 and an operational license number of 421/KEP.246-HUK/2005. It is a public school owned by the local government of Tangerang Regency. The school is located on Jl. Perum Mulya Asri 2 Citra raya 10/04 Sukamulya Village, Cikupa Subdistrict, Tangerang Regency, Banten Province. Regarding population zoning, SMP Negeri 2 Cikupa is located near the Citra Raya residential area and is directly adjacent to several villages within the Sukamulya urban village and Peusar Panongan village.

The facilities owned by this school are pretty complete, such as the availability of a building consisting of 28 classrooms, a teacher's office, administrative room, principal's room, treasurer's room, curriculum room, PKS room, an art room, a performance stage, library, futsal court, computer lab, canteen, UKS room, dapodik room, paskibra room, student council room, kitchen, parking lot, sanisek, internet network and school garden. The number of students currently reaches 1166, divided into 28 classes with 586 male and 580 female students.

The number of teaching teachers and administrative staff is 49 people, with details of 38 teaching teachers and 11 administrative staff. Furthermore, pretest and posttest testing was carried out on the experimental class and control class, and obtained as can be seen in Table 1.

Table 1. Comparison of Results Between Classes

No.	Type	Total Pretest	Total Posttest	Total Value Development	Pretest Average	Posttest Average	Average Value Development
1	Experiment Class	1660	3660	2000	40	89	49
2	Control Class	2160	3350	1190	53	82	29

Based on the comparison table of pretest and posttest results between the experimental class and the control class, the results of the development of the total value of the experimental class increased significantly, namely 2000 compared to the development of the control class value of 1190 as well as the average value, the development of the average value of the experimental class increased from 40 to 89 with an average value development of 49 while the control class also experienced the development of the average value from 53 to 82 with an average value development of 29.

In the next stage, the experimental class students' answers to the questionnaire filled in were collected. From the data obtained, a prerequisite test consisted of a validity, reliability, normality, and homogeneity test. The test results are that all the data collected have passed the prerequisite test.

Furthermore, the data that has passed is analyzed using hypothesis testing consisting of a t-test, f-test, and determinant coefficient with the following results;

The results of the t-test show that the t value of the literacy variable is greater than the t table value with ($4.676 > 2.042$) and a significant level below 0.05, namely 0.00, and the t value of the numeracy variable is greater than the t table value ($3.527 > 2.042$) with a significant level below 0.05, namely 0.01. Based on the t-test results, it can be concluded as follows: (1) Literacy variables partially have a significant effect on students' 21st-century skills, and (2) Numeracy variables partially have a significant effect on students' 21st-century skills. Meanwhile, the data processing results show that the calculated f value is $11.691 > 2.85$ as the F table, and the significance value is $0.00 < 0.005$ with a significance value of 0.00 smaller than 0.05. Therefore, in this study, it can be concluded that simultaneously or together influence 21st-century skills. The coefficient of determination can be seen from the R square value of 0.343. If it is made into a percentage, the result is 34.3%, meaning that the literacy and numeracy variables have a percentage of influence on 21st-century skills of 34.3%. Other factors outside the variables in this study determine the rest.

CONCLUSION

Based on the data collection, data analysis, and research testing entitled "Implementation of Literacy and Numeracy Learning in Social Studies Subjects in Developing 21st Century Student Skills at SMP Negeri 2 Cikupa, Tangerang Regency", the following conclusions can be drawn. The results of testing the research hypothesis show a positive and significant effect partially between literacy and 21st-century skills of students at SMP Negeri 2 Cikupa in the sense that literacy learning has an impact on changes in 21st-century skills of students. This is evidenced by the value in the t-test results, which shows that $t\text{-count } 4.676 > t\text{-table } 2.042$ and $\text{Sig. } 0.000 < \alpha 0.05$. So, it can be concluded that hypothesis H_a , which states "Implementation of Literacy Learning in Social Studies subjects on 21st Century Skills," is accepted based on the assumption of the previous hypothesis. The results of testing the research hypothesis show a positive and significant effect partially between numeracy and 21st-century skills of students at SMP Negeri 2 Cikupa in that numeracy learning impacts changes in students' 21st-century skills. This is evidenced by the value in the t-test results, which shows that $t\text{-count } 3.527 > t\text{-table } 2.042$ and $\text{Sig. } 0.001 < \alpha 0.05$. So, it can be concluded that hypothesis H_a , which states "Implementation of Numeracy Learning in Social Studies subjects on 21st Century Skills," is accepted based on the assumption of the previous hypothesis. The research proves and shows positive and significant results of implementing literacy and numeracy learning in social studies subjects towards 21st-century skills at SMP Negeri 2 Cikupa, Tangerang Regency.

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