825-Hery Suharna.pdf

by 1 1

Submission date: 01-Jun-2025 01:53PM (UTC+0700)
Submission ID: 2689450415
File name: 825-Hery_Suharna.pdf (3.26M)
Word count: 6602
Character count: 37877

IJORER : International Journal of Recent Educational Research
Homepage : https://journal.ia-education.com/index.php/ijorer
Email : ijorer@ia-education.com

p-ISSN : 2721-852X ; e-ISSN : 2721-7965
IJORER, Vol. 6, No. 3, May 2025
Page 946-961

Reconstructing Productive, Connective, and Assimilative Numeracy Literacy Skills Using Flip Bookmaker Electronic Media

Hery Suharna[1*], Sulami Sibua[2], In Hi. Abdullah[3], Lamanisa R. Saputra[4]
[1,2,3]Universitas Khairun, Ternate, Indonesia
[4]University of Washington, Washington State, United States of America.

Check for updates

DOI : https://doi.org/10.46245/ijorer.v6i3.825

Sections Info

Article history:
Submitted: March 06, 2025
Final Revised: May 08, 2025
Accepted: May 29, 2025
Published: May 31, 2025

Keywords:
Ability; Numeracy Literacy; Flip Bookmaker

ABSTRACT

Objective: The purpose of this study is to see how the reconstruction of students' numeracy literacy skills through electronic media flip book maker. This is because literacy research is quantitative. Literacy is a very interesting topic of discussion today in the world of education. The difficulty of numeracy literacy in everyday life on campus is a challenge in itself. **Method:** Quantitative research type. Research subjects with categorization of numeracy literacy skills, namely very high, high and moderate based on the acquisition of pre-test and post-test data to classify based on ability, then based on the classification, how numeracy literacy is reconstructed. The analysis technique used is quantitative to classify literacy and qualitative to describe the reconstruction of numeracy literacy. **The results** of the study found (1) productive reconstruction occurred in very high category numeracy literacy skills, namely starting with improving numeracy literacy skills when disequilibration occurs and then carrying out productive knowledge reconstruction, (2) connective reconstruction occurred in high literacy skills, namely starting with improving numeracy literacy skills when disequilibration occurs in solving problems and then carrying out connective knowledge reconstruction and (3) assimilative reconstruction, namely with reconstruction with moderate category numeracy literacy skills, namely starting with improving numeracy literacy skills when disequilibration occurs in solving problems and then carrying out assimilative knowledge reconstruction. **The novelty** in this study reveals productive, connective and assimilation reconstruction in students' numeracy literacy skills. Productive, connective and assimilation reconstruction are initial data used in learning to map students' learning readiness, especially in mathematics learning.

INTRODUCTION

In general, numeracy literacy for students faced by students today is a very difficult problem. Literacy habits for students during learning, low interest in reading by students, lack of references owned, lack of utilization of electronic media especially applications both online and offline applications that are in accordance with the industrial revolution era (Dantes and Handayani 2021). One application that is in accordance with the current era is flip bookmaker in learning. There are the most prominent characteristics when discussing reading and writing literacy and numeracy literacy. Literacy activities in the learning phase aim to develop the ability to understand texts and relate them to personal experiences, think critically, and process communication skills creatively through activities responding to electronic flip bookmaker book texts (Ulfa and Athena 2023). Numeracy literacy is the knowledge and skills to (a) use various numbers and symbols related to basic mathematics to solve practical problems in various contexts of everyday life and (b) analyze information

displayed in various forms (graphs, tables, charts, and so on) then use the interpretation of the results of the analysis to predict and make decisions. The pandemic has made us aware that we should not only be satisfied with studying mathematics, but also literacy in mathematics, known as numeracy literacy.

Digital media Flipbook based on Local Games to Improve Reading Literacy of Elementary School Students in Palaan Village in the Covid-19 Era has passed validation by media experts, material experts, and reading literacy instrument experts. Digital media flipbook based on local games is valid and suitable for use as a learning medium after going through a stage of improvement according to the suggestions and comments given by the experts. Judging from the results of the media expert validation of 94%, the results of the material expert validation of 93%, and the reading literacy instrument expert of 93%. Based on the results of the description above, the product developed by the researcher, namely Digital Media Flipbook based on Local Games to Improve Reading Literacy in the Covid-19 Era, is said to be "valid and very suitable" for use as a supplementary learning media (Cholifah and Muslihasari 2022). The success of this study has leverage for the development of learning innovations in seeing the improvement of reading and writing literacy and numeracy skills with flip bookmakers by mapping them to improve problem-solving skills.

Etymologically, the term literacy itself comes from the Latin "literatus" which means a person who studies. In this case, the term literacy is closely related to language skills. Simply put, literacy is the ability to read and write (Arahmah, Banindra Yudha, and Ulfa 2021). This reading and writing literacy is very important because it can support children's achievements to achieve success in the future so that it requires a strategy, therefore its development requires the right strategy (Rachman et al. 2021). The rapid advancement of science requires every student to have better reading and writing skills, with the aim that students have sufficient insight and knowledge to be able to compete and keep up with the times. Reading skills play a role and are one of the determinants of a person's success or failure, this is because all access to information and knowledge that is owned is always related to reading activities (Arahmah et al. 2021). Good numeracy literacy skills in students can help students in the future. Literacy is the ability to read, write, search, manage, and understand information (Dewayani et al. 2021). Literacy is important to develop because reading skills are the main ability to achieve other skills. Reading ability is a basic skill that every individual must have. Information in the current digital era is easily obtained. Good individual literacy is expected to be able to analyze the information wisely. Good individual literacy is not easily influenced by conditions that are not necessarily true (Han et al. 2017) (Arahmah, Banindra Yudha, and Ulfa 2021; Ulfa and Athena 2023). Literacy ability is a strong and deep concern accompanied by a feeling of pleasure in reading activities, thus directing individuals to read of their own accord. The ability to read is not just born in a person, but an interest in reading must be fostered from an early age. Cultivating students' interest in reading is better done at an early age. The purpose of fostering an interest in reading is so that reading becomes a necessity for students' lives, not just a hobby or pleasure in their spare time. If the literacy skills of students are higher, then the desire to read will also be higher (Rahmah 2023)(Afandi, Fathin, and Waliyudin 2022; Fitriani et al. 2023; Hidayati, Andrianto, and Melani 2024). Literacy skills are an important key to the progress of a nation, because mastery of science and technology can only be achieved with a high interest in reading, not listening or listening activities. Farmers in rural areas will be able to make their crops fertile and produce abundantly because they listen to directions from extension officers, but they will not be able to produce superior seeds and create sophisticated agricultural technology if they do not read. Literacy and

numeracy are the most well-known things for a long time in terms of human civilization. This is very important and useful if mastered and applied in everyday life. Having literacy and numeracy skills means having abilities that are closely related to understanding numbers and letters where this is indeed mandatory and known by all people including the current school community. Simply put, numeracy is related to the ability to use various number concepts in real life (Ayu, Suharna, and Ardiana 2017) (H Suharna and Abdullah 2020) (Kehumasan et al. 2020; Melawati 2022; Putra and Afrilia 2020; Sagala et al. n.d.; Sulistiyawati et al. 2021).

Specifically, studying literacy and numeracy for the school community, namely (1) honing and increasing the strengthening and skills in interpreting numbers, tables, etc., (2) students use knowledge and skills to be able to solve problems in class, (3) students have the ability to calculate and interpret the data they obtain, and (4) students become stronger in terms of their human resources (Suharna and Alhaddad 2018). Literacy is one of the government's priority programs for 2019 (Dantes and Handayani 2021; Dewayani et al. 2021; Han et al. 2017; Rachman et al. 2021; Wijayanti, Prabandono, and Kusnandar 2015; Yuliawanti, Suciati, and Ariyanto 2019). Literacy skills are considered to play an important role in the intellectual growth and competition of every individual in Indonesia. The School Literacy Movement (GLS) has actually been encouraged since 2015 in line with the issuance of the Regulation of the Minister of Education and Culture Number 23 of 2015 concerning the Development of Character. In order to make Indonesia's development in the 21st century a success, it is imperative for Indonesian people or educational institutions to master six basic literacies, namely: language literacy, numeracy literacy, science literacy, digital literacy, financial literacy, and cultural and civic literacy. This literacy ability must also be balanced by developing competencies that include critical thinking/problem solving skills, creativity, communication, and collaboration. E-Books can be created using the Flip Book Makers application. E-books are software that is often used in learning, this can make it easier for students to learn, especially in the era of the industrial revolution 4.0. Research conducted by (Kehumas et al. 2020) e-books are the result of very effective software used in classroom learning. The advantages of this e-book are: (1) it can be opened wider in the application, making it easier for students to learn, (2) Practical in learning, namely e-books can be carried by only those who install e-books on cellphones or laptops. (3) in making e-books, not only text can be displayed, but also images and even learning videos, and (4) if in certain situations, e-books can be saved on a drive and/or in HTML, fles, SWF so that it is easier for students to do activities. The results of the study with the problem of research on the use of electronic books (e-books) with mobile phones and laptops. The results of the study show that there are weaknesses in e-books on cellphones and laptops, the appearance of e-books with cellphones is more practical and easier to operate compared to laptops. Therefore, the display that can be made only uses a cellphone. The results of the study with the problem of research on the use of electronic books (e-books) with mobile phones and laptops. The results of the study show that there are weaknesses in e-books on cellphones and laptops, the appearance of e-books with cellphones is more practical and easier to operate compared to laptops. Therefore, the display that can be made only uses a cellphone. Meanwhile, the pages are only a few when using a laptop, so the display is more complex and impractical. So that readers experience limitations in learning with e-books using a laptop. However, this can be an alternative if you open an e-book on a laptop or computer Borg and Gall (2017) (Arahmah et al. 2021; Dantes and Handayani 2021; Rachman et al. 2021; Ulfa and Athena 2023; Wijayanti et al. 2015; Yuliawanti et al. 2019).

A gap occurs when there is a difference or gap between the results of previous research and new data or findings in the field. From the description above, it can be seen that there is a gap in research results on literacy, therefore the research aspect has not been fully researched or understood, namely the reconstruction of the literacy process in solving mathematical problems. This can be caused by several factors such as limited theory, insufficient research evidence in research that has been conducted.

Based on the study above, this research aims to reveal how productive, connective and assimilative reconstruction occurs through students' numeracy literacy skills using the electronic book media flip bookmaker.

RESEARCH METHOD

Research on the reconstruction of thinking in solving literacy problems with quantitative research types. Research subjects with categorization of numeracy literacy abilities, namely very high, high and moderate based on the acquisition of pre-test and post-test data to classify based on ability, then based on the classification, how the reconstruction of numeracy literacy is described (Hery Suharna and Abdullah 2020) as follows:

Table 1. Category sasi level of numeracy literacy skills

No	Score Interval	Category
1	81% - 100%	Very high
2	61% - 80%	Tall
3	41% - 60%	Currently
4	21% -40 %	Low
5	0% - 20 %	Very low

Furthermore, based on the categorization, it reveals how to reconstruct students' numeracy literacy skills with the following analysis: Data collection techniques in research developing E-books (Electronic books) in improving students' reasoning in solving mathematical problems, namely (1) think aloud or think out aloud, (2) conducting interviews, (3) data acquisition, which means the results of interviews, data results with think aloud and observation results, (4) researchers as the main instrument conduct observations, analyze research data, interpret research data and make conclusions based on the characteristics of students' mathematical reasoning structures, (5) finally to collect data through focused discussions, aiming to find meaning related to the formulation of the problems raised.

Description of the research data analysis process in revealing the reconstruction of student understanding using research data analysis steps according to Creswell (2010:276):

1. Processing and preparing valid data for analysis. In this step, the researcher triangulates data in order to obtain valid data. The triangulated data are exploration results, think aloud data interviews and observation results. Data triangulation is obtained based on think aloud data transcription, interviews, scanning materials, typing field data or sorting and arranging the data into different types depending on the source of information.
2. Reading all data. Making a generalization of the information obtained and reflecting on its overall meaning. What is the idea? What is the impression of depth and credibility? At this stage, the researcher writes special notes or general ideas about the data obtained.

3. Analyze in more detail by coding the data. This step involves several stages: taking written or image data that has been collected, segmenting the sentences or images into categories, then labeling these categories with specific terms.
4. Applying the coding process to describe the categories and themes to be analyzed.
5. Describe and these themes will be presented again in a qualitative narrative/report.
6. Interpret or give meaning to the data. The researcher confirms whether the research results confirm or deny previous information. Interpretation/meaning also consists of new questions that need to be answered next: questions that arise from the data and analysis.

An overview of the research procedures in the research can be seen in the research flow diagram which can be presented in Figure 1 as follows:

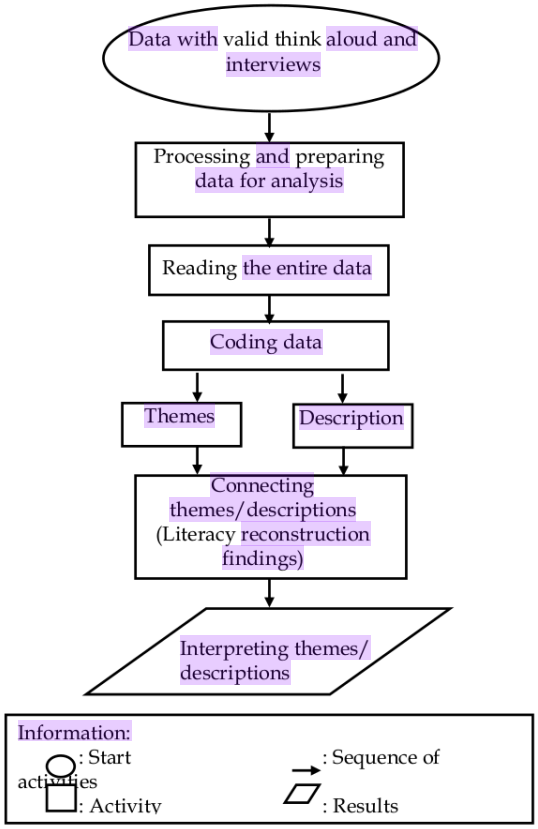


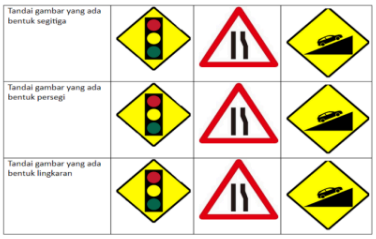
Figure 1. Flowchart of research procedures

Creating Categorization

Next is categorization has a purpose in research, the purpose of categorization is conveyed by Subanji (2011:70), namely: (1) grouping units that have been created into clearly related content parts; (2) formulating rules that describe the category area and which can ultimately be used to determine the inclusion of each unit in the category and also as a basis for checking the validity of the data; (3) ensuring that each category that has been compiled follows the principle of obedience to the principles. categories are carried out in relation to obedience to the principles.

Development of numeracy literacy instruments

Table 2. Development of Numeracy Literacy Instruments

NO	Question	Reason
1.	Look at the following picture!  The correct image 5 is…	
2.	Pay attention to the following calculations! 345 29A + BC4 No. | Statement | true | false 1 | A must be replaced with the number 1 | | 2 | B must be replaced with the number 6 | | 3 | C is replaced with the number 3 | |	
3.	Mark the picture according to the statement on the left  	

RESULTS AND DISCUSSION

Result

Categorization of research subjects

The students who are the subjects of the research representing the Productive Reconstruction of Numeracy Literacy Ability in the Very High Category are 2 students, hereinafter referred to as ST. The students who are the subjects of the research

representing the Connective Reconstruction of Numeracy Literacy Ability in the High Category are 2 students, hereinafter referred to as subject T. The students who are the subjects of the research representing the Assimilative Reconstruction of Numeracy Literacy Ability in the Very High Category are 2 students, hereinafter referred to as S.

Of the indicators of numeracy literacy skills, the third indicator is the lowest indicator, namely interpreting the results of the analysis to predict and make decisions. Furthermore, the indicator uses various numbers and symbols related to basic mathematics in solving practical problems in the context of everyday life. Based on these results, students are the first indicator question, it is known that students have difficulty in working on it. The cause is the lack of application of numeracy literacy in everyday life.

Based on the treatment, data was obtained showing an increase in literacy skills, which is described in detail in the following table 2:

Table 3. Presentation of research data

No	Category	Pre test	Amount	Post tes	Amount
1.	Very high	0%	0	79,41%	27
2.	Tall	0%	0	14,71%	5
	Currently	17,65%	6	5,88%	2
3.	Low	82,35%	28	0%	0
4.	Very low	0%	0	0%	0
	Amount		**34**		**34**

Discussion Based on the pre-test and post-test, it can be seen that the level of student mastery of the material is (1) In the pre-test, there were no students in the very low category, then there were 15 students (50%) in the low category, which means that 50% of the 40 students were not yet able to apply mathematics. The other 15 students or 50% of students were in the low category, students who were able to use formulas and carry out simple procedures, and 0% of the pre-test results of students were in the high and very high categories or it can be said that no students were able to meet all indicators of numeracy literacy skills; and (2) Based on the results of the post-test, there were 0% of students in the very low category, there were 2 (6.66%) students in the low category, 23 (76.67%) were in the medium category, in other words, students were able to use formulas, and 5 (16.67%) students were in the high category, meaning students who were able to use relevant information from questions, use formulas and were able to carry out simple procedures to answer questions.

Based on the categorization above, the students who are the subjects of the research representing the Productive Reconstruction of Numeracy Literacy Ability in the Very High Category are 2 students, hereinafter referred to as ST. The students who are the subjects of the research representing the Connective Reconstruction of Numeracy Literacy Ability in the High Category are 2 students, hereinafter referred to as subject T. The students who are the subjects of the research representing the Assimilative Reconstruction of Numeracy Literacy Ability in the Very High Category are 2 students, hereinafter referred to as S.

Discussion

In the discussion of the research results, namely (1) productive reconstruction, (2) connective reconstruction and (3) assimilative reconstruction in solving students' numeracy literacy problems.

The relevant research in this study is Piaget's assimilation and accommodation theory, namely Assimilation When we experience something new, we try to interpret it or present it within our existing knowledge framework. For example, if a child sees literacy, then we put it into the "numeracy literacy" scheme that already exists in his mind. Accommodation sometimes we need to change or adjust our scheme to match new information. For example, if the child sees the real number system, then we may need to change the "same as the integer system" scheme or even create a new scheme for unusual small animals. Assimilation and accommodation schemes according to Puaget As follows:

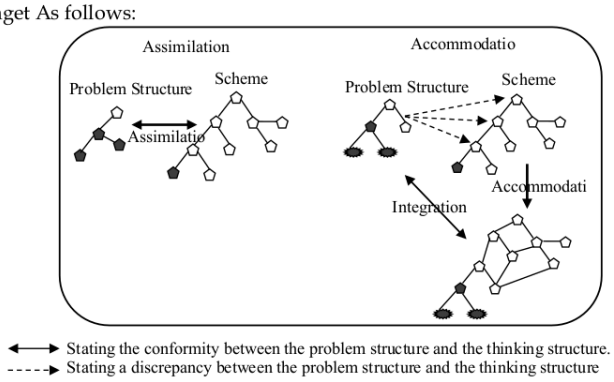


Figure 2. Assimilation and Accommodation Process according to Piaget's theory

Piaget's theory is a relevant research in the discussion of productive, connective and assimilative reconstruction through students' numeracy literacy skills in the discussion of this research.

1. Productive reconstruction of very high category numeracy literacy skills

Subjects in the very high category with code (ST) when solving numeracy literacy problems experienced disequilibration, this can be seen clearly from the statements of subjects in this category as follows:

TS subject: *I forget what concept corresponds to this* picture (subject is silent for a long time)

When this disequilibration occurs, the subject tries to find a solution by reconstructing it. This is in accordance with his statement that

Subject ST: *If I remember correctly,*

Based on the statement of the subject ST, the knowledge that the subject has about the problem is not yet appropriate, therefore there is a mismatch or inconsistency between the knowledge and what is owned and the problem faced. Based on the characteristics that appear, it is a characteristic of the occurrence of disequilibration of the subject ST. This is reinforced by the results of documentation with observations by researchers in Figure 3 below.

Figure 3. Subjects reconstruct numeracy literacy skills

The observation results show that there are characteristics of disequilibration, namely that subject ST takes a long time to answer the questions given when solving the questions. This is reinforced by the statement of subject ST above that "*I forgot what concept is appropriate for this picture*"

Based on the statement and picture, it can be seen that subject ST experienced difficulties when he first saw the literacy question, thus indicating that disequilibration occurred in subject ST. Therefore, it can be concluded that ST experienced disequilibrium when he first mocked the question.

This is in accordance with the research results that reconstruction starting from the objectives, tools, materials, work steps, data interpretation to questions is able to construct students' understanding well, is able to train critical thinking skills and make practical activities more meaningful (Niam and Ibrahim 2025), (Nurhayati 2024), (Safitri et al. 2025), (Praktis 2025).

Subject ST: *For question number one, it is related to numbers by determining the next term, as well as numbers 2 and 3. So they are very related to each other.*

Based on the information and work results of Subject ST, it shows that there is disequilibration in solving problems and then carrying out productive reconstruction, this can be seen from the results of complete work when solving literacy problems, by having various solutions by working on questions correctly and precisely.

Next, the structure of the productive reconstruction of high category numeracy literacy skills in solving problems is presented in diagram 4 below.

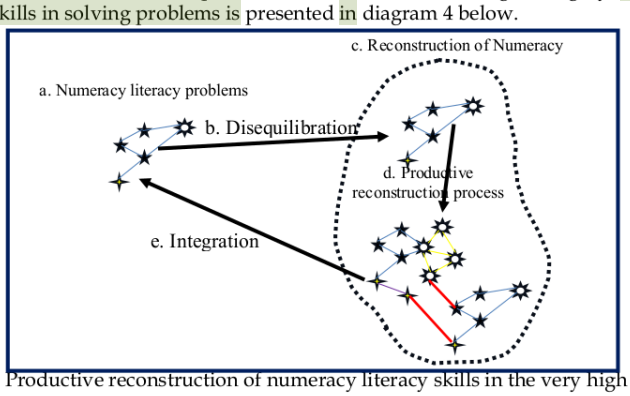


Figure 4. Productive reconstruction of numeracy literacy skills in the very high category

From diagram 2, it can be seen that subject ST carried out productive reconstruction based on very high category numeracy literacy skills, namely, it started with improving numeracy literacy skills when disequilibration occurred and then carried out productive knowledge reconstruction. Productive reconstruction is closely related to the reconstruction of knowledge possessed by students, this is in accordance with the results of research that students are able to think critically by using the Constructivism Approach. The critical spirit of students can be seen from the activeness of students in discussions (Putri et al. 2025), (Fuadi and Shaunata 2025), (Sains et al. 2025), (Rahmani and Hikmawan 2025).

2. Connective reconstruction of high category numeracy literacy skills

Subjects in the high category with code (T) when solving numeracy literacy problems experienced disequilibrium, this can be seen from the statements of the subjects in this category as follows:

Subject T: *emmmmmmm...* it's a bit difficult to make the connection (subject is silent while looking at the picture in the question)

From the statement, it can be seen that subject T experienced confusion by expressing it by saying "*emmmmmmmm...*" this characteristic is a characteristic of disequilibration in subject T. Furthermore, when this disequilibrium occurs, the subject tries to find a solution by reconstructing it. This is in accordance with his statement that.

Subject T: *I tried to see the pattern of the picture,,,,*

Subject T tried to overcome disequilibration by doing trial and error when solving the problem. The trial and error process carried out was to connect one concept with another concept. Subject T connected numbers with image patterns in each problem, this is based on the researcher's observations as follows

Figure 5. Subjects carry out connective reconstruction of high numeracy literacy skills

From Figure 4, it can be seen that there is a disequilibration when solving numeracy literacy problems after being treated with electronic books. Thus, subject T experiences disequilibration, namely there is a mismatch between the knowledge possessed and the problem faced or the numeracy problem currently being faced.

Subject T: *Yes, I remember, this is related to numbers, both questions 1, 2 and 3,,, OK, I understand now.*

Based on the information and work results of Subject T, it shows that there is disequilibration in solving problems and then carrying out connective reconstruction, this can be seen from the results of the work that is complete when solving literacy problems. Furthermore, the structure of the connective reconstruction of high category numeracy literacy skills in solving problems is presented in the following diagram 6.

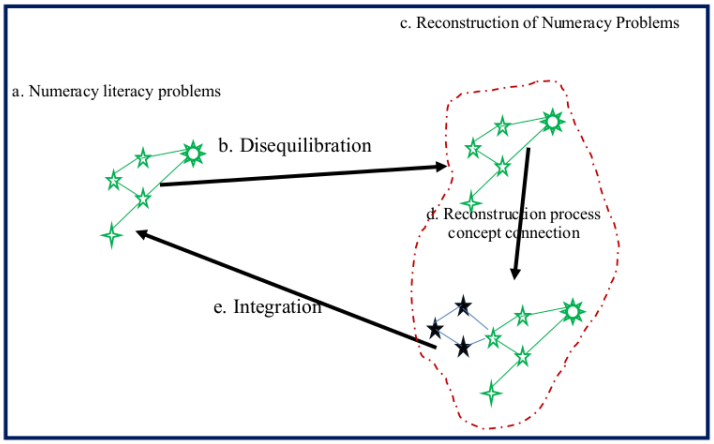


Figure 6. Connective reconstruction of high category numeracy literacy skills

Based on figure 6, connective reconstruction occurs based on high literacy skills, namely, it occurs at the beginning of improving numeracy literacy skills when disequilibration occurs in solving problems and then carrying out connective knowledge reconstruction. This is in accordance with research results that show that students are able to solve problems and find understanding and ideas from what they have learned and then construct their knowledge (JASMINE 2014), (Mardiyah, Muzakki, and Supriatno 2025), (Ishak, Bakar, and Saputra 2025).

3. Assimilative reconstruction of numeracy literacy skills in the moderate category

Subjects in the medium category with code (S) when solving numeracy literacy problems experienced disequilibration, this can be seen clearly from the statements of subjects in this category as follows:

Subject S: *looks rather easy* (subject is silent while looking at the picture in the question)

From the statement of subject S, it can be seen that the subject has confidence that the question is easy, although the subject is not yet sure that the question is easy, this can be seen from the statement of subject S that "*it looks quite easy*" but the subject is silent while looking at the picture. The characteristics that appear based on the results of the exploration are that disequilibrium occurs when solving the question.

When this disequilibration occurs, subject S tries to find a solution by reconstructing the knowledge he has and then making adjustments to the knowledge he already has. This can be seen based on the results of the researcher's observations and is reinforced by the statement of subject S, the statement and observations of the researcher as follows.

Subject TS: *If I remember correctly,,,*

Figure 7. The subject carried out assimilative reconstruction of moderate numeracy literacy skills.

Subject TS: Yes, I remember, this is related to numbers, both questions 1, 2 and 3,,, ok, I understand now

The results of observations and exploration results on subject S show that in overcoming disequilibration, it has assimilative characteristics. Assimilative means adjusting the knowledge possessed with the problem being faced, with such rapid adjustment, that this adjustment is called assimilative.

Based on the information and work results of Subject TS, it shows that there is disequilibration in solving problems and then carrying out assimilative reconstruction, this can be seen from the results of the work that is complete when solving literacy problems. Furthermore, the assimilative reconstruction structure of high category numeracy literacy skills in solving problems is presented in the following diagram 8.

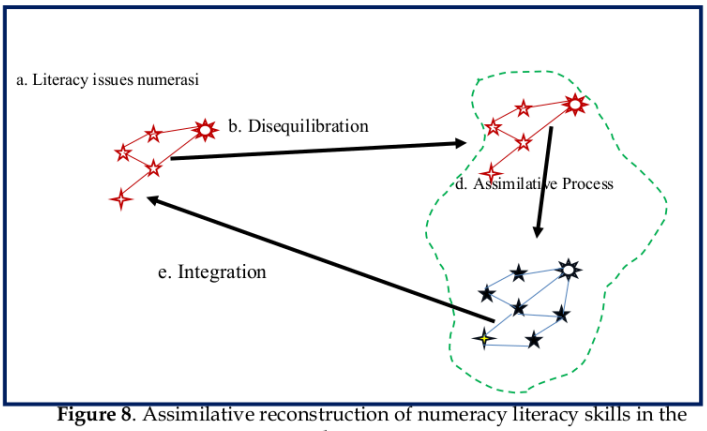


Figure 8. Assimilative reconstruction of numeracy literacy skills in the moderate category

Based on figtur 6 above, assimilative reconstruction, namely reconstruction with moderate category numeracy literacy skills, occurs at the beginning by improving numeracy literacy skills when disequilibration occurs in solving problems and then carrying out assimilative knowledge reconstruction.

Productive reconstruction is closely related to the reconstruction of knowledge possessed by students, this is in accordance with the results of research that students are able to think critically by using the Constructivism Approach. The critical spirit of students can be seen from the activeness of students in discussions (Niam and Ibrahim 2025), (Nurhayati 2025), (JASMINE 2025).

CONCLUSION

Fundamental Finding: (1) productive reconstruction occurs in very high category numeracy literacy skills, namely starting with improving numeracy literacy skills when disequilibration occurs and then reconstructing productive knowledge, (2) connective reconstruction occurs in high literacy skills, namely starting with improving numeracy literacy skills when disequilibration occurs in solving problems and then reconstructing connective knowledge and (3) assimilative reconstruction, namely reconstruction with moderate category numeracy literacy skills, namely starting with improving numeracy literacy skills when disequilibration occurs in solving problems and then reconstructing assimilative knowledge. ***Implication:*** This study reveals productive, connective and assimilation reconstruction in students' numeracy literacy skills. Productive, connective and assimilation reconstruction are initial data used in learning to map students' learning readiness, especially in mathematics learning. ***Limitations:*** thinking reconstruction is a quantitative study that requires in-depth research, therefore it takes time to explore the reconstruction that emerges. There needs to be an implementation in further learning by creating experimental classes and control classes. ***Future Research***: this thinking reconstruction research can be developed in (1) developing a comparative learning model that is integrated with numeracy literacy, (2) it can be developed how to see reconstruction from various aspects such as reading literacy, writing literacy, technology literacy, and others, (3) it can be developed for learning design to combine learning models with numeracy literacy, (4) it can be developed to see how it influences students' thinking reconstruction in numeracy literacy in class.

ACKNOWLEDGEMENTS

The study was financially supported by the Directorate of Research and Community Service, Directorate General of Higher Education, Ministry of Education and Culture, Republic of Indonesia (Contract No. 055/E5/PG.02.00.PL/2024; 411/PEN-PKDN/PG.12/2024).

REFERENCES

Afandi, Hanif Abdul Karim, Muhammad Akmal Fathin, and Dzulfiqar Satria Waliyuddin. 2022. "Reconstruction of Steps for Solving Quadratic Inequalities with the Help of Algebra." Imajiner: Journal of Mathematics and Mathematics Education 4(2):183–93. https://journal.upgris.ac.id/index.php/imajiner/article/view/9930

Arahmah, Fidian, Chrisnaji Banindra Yudha, and Dan Maria Ulfa. 2021. "Improving Numeracy Literacy Skills in Mathematics Through the Student Facilitator and Explaining Method." *Prosiding Seminar Nasional Pendidikan STKIP Kusuma Negara III SEMNARA 2021* (2015):209–18. https://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/view/1300

Dantes, Nyoman, and Ni Nyoman Lisna Handayani. 2021. "Improving School Literacy and Numeracy Literacy Through the Blended Learning Model for Grade V Elementary School Students in Singaraja City." Widyalaya: Journal of Educational Sciences 1(3):269–83.

https://scholar.google.co.id/scholar?q=%E2%80%9CPeningkatan+Literasi+Sekolah+Dan+Literasi+Numerasi+Melalui+Model+Blended+Learning+Pada+Siswa+Kelas+V+SD+Kota+Singaraja.%E2%80%9D&hl=en&as_sdt=0&as_vis=1&oi=scholart

Dewayani, Sofie, Pratiwi Retnaningdyah, Billy Antoro, Dicky Susanto, Trisno Ikhwanudin, Farinia Fianto, Wien Muldian, Yanuardi Syukur, and Yasep Setiakarnawijaya. 2021. Guide to Strengthening Literacy and Numeracy in Elementary Schools. https://repositori.kemdikbud.go.id/22599/

Fitriani, Baiq Nurul Fitriani, Syahrul Azmi, Nourma Pramestie Wulandari, and Nani Kurniati. 2023. "Analysis of Mathematical Critical Thinking Ability Reviewed from Students' Cognitive Style." *Mandalika Mathematics and Educations Journal* 5(2):223–32. doi: 10.29303/jm.v5i2.6341. https://journal.iainkudus.ac.id/index.php/jmtk/article/view/6341

Fuadi, Muhammad Ashar, and Via Amalia Shaunata. 2025. "2025 Madani: Multidisciplinary Scientific Journal Reconstruction of Physics Learning Using Constructivism Approach as Implementation of Thomas Kuhn's Science Revolution. 2025 Madani : Jurnal Ilmiah Multidisipline." 3(1):679–85. https://doi.org/10.5281/zenodo.14649557

Han, W., Dicky. Susanto, Sofie. Dewayani, Putri. Pandora, Nur. Hanifah, Miftahussururi., Meyda Noorthertya. Nento, and Qori Syahriana. Akbari. 2019. "'Materi Pendukung Literasi Numerasi.'" *Kementrian Pendidikan Dan Kebudayaan, Tim GLN Kemendikbud*. 8(9):1–58. https://repositori.kemdikbud.go.id/11628/

Hidayati, Arini Ulfah, Dedi Andrianto, and Anggun Melani. 2024. "Reconstruction of Mathematics Learning Evaluation Based on Problem Based Learning (Study in Class X MA Bustanul 'Ulum Jayasakti Central Lampung)." 07(01):6228–36. https://jonedu.org/index.php/joe/article/view/7228.

Ishak, Hasriani, Marwia Tamrin Bakar, and Lamanisa Rasid Saputra. 2025. "Analysis o f Students ' Learning Obstacles in The Differential Equations Course Reviewed from Their Problem-Solving Ability." 6(1):139–53. https://doi.org/10.46245/ijorer.v6i1.738

Jasmine, khanza. 2025." Addition of Sodium Benzoate and Potassium Sorbate (Anti-inversion) and Stirring Speed as an Effort to Inhibit Inversion Reactions in Sugarcane Juice 5(1):1–8. https://repository.ub.ac.id/id/eprint/150912/

Kehumasan, Gunahumas Jurnal, Aceng Cucu Bunyamin, Dewi Rika Juita, and Noer Syalsiah. 2020. "The Use of Kahoot as a Game-Based Learning Media as a Form of Learning Variation." 3(1):43–50. https://ejournal.upi.edu/index.php/gunahumas/article/view/28388

Mardiyah, Fitri Husni, Naufal Ahmad Muzakki, and Bambang Supriatno. 2025. "Innovation of Contextual Learning Approach Through Google Sites on Critical Thinking Skills in Climate Change Material" (Innovation of Contextual Learning Approaches Through The Google Site on Critical Thinking Ability On Climate Change Materials ." 11:104–9. https://online-journal.unja.ac.id/biodik

Melawati, Reni. 2022. "The Use of Kahoot Applications in Improving Student Creativity." Research Journal. 16(1):149. doi: 10.21043/jp.v16i1.13319. https://journal.iainkudus.ac.id/index.php/jurnalPenelitian/article/view/13319

Niam, Khoirul, and Rustam Ibrahim. 2025. "Reconstruction of Contemporary Islamic Thought: An Integrative-Interconnective Approach." 07(1):160–70.

https://journalpedia.com/1/index.php/jipp

Nurhayati, Made. 2025. "Journal of Innovative Education Journal of Innovative Education" 6(April):226–37. https://journalpedia.com/1/index.php/jpi/issue/view/1496

Praktis, Teoretis D. A. N. 2025. "Reconstruction of social science learning through independent learning: perspective" 13(1):66–72. https://journal.ipts.ac.id/index.php/ED/article/view/6492

Putra, Aan, and Kesi Afrilia. 2020. "systematic literature review: the use of kahoot in mathematics learning." AL-QALASADI Scientific Journal of Mathematics Education 4(2):110–22. https://journal.iainlangsa.ac.id/index.php/qalasadi/article/view/2127

Putri, Annisa Syafigha, Widi Purwianingsih, Biology Education Study Program, Indonesian University of Education, and West Java. 2025. "Analysis & Reconstruction of Bone Laboratory Activity Design to Train Students' Critical Thinking Skills 1,2,3)." 74–86. http://jurnal.stkippgritulungagung.ac.id/index.php/eduproxima

Rachman, Bagus Ali Rachman, Firyalita Sarah Fidaus, Nurul Lailatul Mufidah, Halimatus Sadiyah, and Ifit Novita Sari. 2021. "Improving Students' Literacy and Numeracy Abilities Through the Class 2 Teaching Campus Program." Dinamisia: Journal of Community Service. 5(6):1535–41. doi: 10.31849/dinamisia.v5i6.8589. *https://journal.unilak.ac.id/index.php/dinamisia/article/view/8589Pengabdian Kepada Masyarakat* 5(6):1535–41. doi: 10.31849/dinamisia.v5i6.8589.

Rahmani, Zulfa, and Rizki Hikmawan. 2025. "Development of Interactive E-Modules in Mathematics Subjects to Improve Critical Thinking Skills of Elementary School Students." 14(1):743–56. https://jurnaldidaktika.org/contents/article/view/2000

Safitri, Rini Rahma, Gita Asyari, Dara Avira, and Abdul Fattah Nasution. 2025. "Reconstruction of 21st Century Students' Learning Interests Through Dynamic System Models." https://journal.amikveteran.ac.id/index.php/sscj

Sagala, Artha Uli, Dita Dewi, Safira Hutagaol, Kesy Ariani Haloho, Nurul Aini, and Tangson R. Pangaribuan. n.d. 2023. Using the Kahoot application as a learning medium while playing in learning Indonesian. https://digilib.unimed.ac.id/id/eprint/43426/

Sains, Jurnal, Ridho Akbar, Institusi Agama, Islam Negeri, Palangka Raya, Institusi Agama, Islam Negeri, Palangka Raya, Kota Palangka, and Kalimantan Tengah. 2025. "The Influence of Experiential Learning Model on Students' Critical Thinking Skills in Islamic Cultural History Subjects." 3(1):496–503. https://doi.org/10.61722/jssr.v3i1.3578

Sulistiyawati, Wiwik, Rijalush Sholikhin, Dian Septi Nur Afifah, and Tomi Listiawan. 2021. "The Role of Kahoot! Educational Games in Supporting Mathematics Learning." Mathematics Journal 15(1). https://ejournal.undiksha.ac.id/index.php/JPM/article/view/29851

Ulfa, Siti Maria, and Tera Athena. 2023. "Improving Literacy and Numeracy Skills Through Tutoring Activities." Reswara: Journal of Community Service 4(2):1032–37. doi: 10.46576/rjpkm.v4i2.3045. https://jurnal.dharmawangsa.ac.id/index.php/reswara/article/view/3045

Wijayanti, Supriyani, Bayu Prihandono, and Dadan Kusnandar. 2015. "Dijkstra's Algorithm for Finding the Shortest Path and Optimizing Garbage Transport Vehicles in Pontianak City." Scientific Bulletin of Math. Stat. and Its Applications

(Bimaster) 04(3):243–50. https://jurnal.untan.ac.id/index.php/jbmstr/article/view/11619.

Yuliawanti, Esti, Suciati Suciati, and Joko Ariyanto. 2019. "The Influence of Problem Based Learning Model with Scaffolding Learning Activities on Students' Problem Solving Ability." Bio-Pedagogy 8(1):23. doi: 10.20961/bio-pedagogi.v8i1.35547. https://jurnal.uns.ac.id/pdg/article/view/35547.

*Hery Suharna
Department of Mathematics Education,
Universitas Khairun,
Jl. Bandara Ababullah kampus 1 Unkhair. Kel. Akehuda Kota Ternate Utara, Kota Ternate,
Maluku Utara, Indonesia
Email: hsuharna@yahoo.co.id

Sulami Sibua
Department of Indonesian Language Educatio, Universitas Khairun,
Jl. Bandara Ababullah kampus 1 Unkhair. Kel. Akehuda Kota Ternate Utara, Kota Ternate,
Maluku Utara, Indonesia
Email: corresp-author@mail.ac.id

In Hi Abdullah
Department of Mathematics Education,
Universitas Khairun,
Jl. Bandara Ababullah kampus 1 Unkhair. Kel. Akehuda Kota Ternate Utara, Kota Ternate,
Maluku Utara, Indonesia
Email: ihabdullah@gmail.kom

Lamanisa Rasid Saputra
Department of Mathematics Education, University of Washington, Washington State,
1410 NE Campus Parkway, Seattle, WA 98195
Email: laman18@uw.edu

825-Hery Suharna.pdf

ORIGINALITY REPORT

23%	20%	8%	8%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	journal.citradharma.org Internet Source	2%
2	jppipa.unram.ac.id Internet Source	2%
3	www.ijstr.org Internet Source	2%
4	ijmmu.com Internet Source	1%
5	media.neliti.com Internet Source	1%
6	Submitted to UIN Sunan Ampel Surabaya Student Paper	1%
7	eprints.umm.ac.id Internet Source	1%
8	ejurnal.stpkat.ac.id Internet Source	1%
9	jurnal.penerbitdaarulhuda.my.id Internet Source	1%
10	journal.ia-education.com Internet Source	1%
11	repository.unja.ac.id Internet Source	1%
12	repository.uhamka.ac.id Internet Source	1%
13	Submitted to Universitas Khairun Student Paper	

		1 %
14	journal.unilak.ac.id Internet Source	1 %
15	Napsiyah Napsiyah, Nurmaningsih Nurmaningsih, Rahman Haryadi. "Analysis of student's mathematic numeration ability Based on cognitive level of materials cube and beam", Jurnal Mercumatika : Jurnal Penelitian Matematika dan Pendidikan Matematika, 2025 Publication	1 %
16	journal3.uin-alauddin.ac.id Internet Source	<1 %
17	psychologyandeducation.net Internet Source	<1 %
18	ejournal.unikama.ac.id Internet Source	<1 %
19	journal.ibrahimy.ac.id Internet Source	<1 %
20	ejournal.ipinternasional.com Internet Source	<1 %
21	Sri Haryani, Yusniarita Yusniarita, Yanti Sutriyanti, Derison Marsinova Bakara. "Knowledge and Attitude of Cadres in the Prevention and Treatment of Diarrhea At Home Among Mothers of Toddlers", JOSING: Journal of Nursing and Health, 2024 Publication	<1 %
22	Submitted to Universitas Negeri Surabaya The State University of Surabaya Student Paper	<1 %
23	ijssers.org Internet Source	

		<1 %
24	online-journal.unja.ac.id Internet Source	<1 %
25	journal.uhamka.ac.id Internet Source	<1 %
26	journalkeberlanjutan.com Internet Source	<1 %
27	ojs.unm.ac.id Internet Source	<1 %
28	ejournal.unsri.ac.id Internet Source	<1 %
29	garuda.kemdikbud.go.id Internet Source	<1 %
30	ejeset.saintispub.com Internet Source	<1 %
31	journal-center.litpam.com Internet Source	<1 %
32	dinastipub.org Internet Source	<1 %
33	ejournal.bumipublikasinusantara.id Internet Source	<1 %
34	ejournal.iainkerinci.ac.id Internet Source	<1 %
35	repository.unisda.ac.id Internet Source	<1 %
36	www.e-iji.net Internet Source	<1 %
37	Julia Agustina, Syofnidah Ifrianti, Hasan Sastra Negara. "Numeration Literacy Of PGMI UIN Raden Intan Lampung Students In Solving	<1 %

Mathematical Problems", Jurnal Gantang, 2023
Publication

38	Patma Sopamena, Intan Rahmawati, Djaffar Lessy, Salmiati Ma'aruf. "ANALYSIS OF STUDENT NUMERACY LITERACY IN SOLVING PISA QUESTIONS", MATEMATIKA DAN PEMBELAJARAN, 2023 Publication	<1 %
39	Desy Natalia Sinambela, Syarwani Ahmad. "Evaluation of school literation movements in improving student discipline", JPGI (Jurnal Penelitian Guru Indonesia), 2021 Publication	<1 %
40	journal.unublitar.ac.id Internet Source	<1 %
41	jurnalnasional.ump.ac.id Internet Source	<1 %

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		