

DEVELOPING A NUMERACY DIAGNOSTIC ASSESSMENT MODULE FOR EARLY PRIMARY SCHOOLERS POST COVID-19 PANDEMIC

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ABSTRACT

School closures due to the COVID-19 pandemic has resulted in learning loss in primary students, so a diagnosis of the students' numeracy skills is urgently needed at the beginning of learning to adapt learning to students' average ability levels (teaching at the right levels). This study aims to develop a module that can assist and become a reference for teachers in schools in diagnosing and mapping students' numeracy abilities at the beginning of learning. This research was carried out following the procedures for research and development (R&D). The developed module was validated by two experts (media and material experts) prior to implementation with the validation results being in very good categories for each aspect of the material, layout, and graphics. The results of the study based on the teacher's response questionnaire indicated that the module developed is very helpful for the teachers in mapping students' numeracy abilities at the beginning of learning after the COVID-19 pandemic, and it provides an alternative follow-up to the results of students' numeracy assessments. Thus, the developed module is suitable for use as a reference in conducting assessments regarding early primary school students' numeracy skills.

Keywords: diagnostic assessment module; early primary schoolers; numeracy; post COVID-19 pandemic

INTRODUCTION

The Coronavirus Disease (COVID-19) pandemic that has occurred since the end of 2019 until now has had a significant impact on various sectors and the life of the global community.¹ Education is one of the sectors affected by the spread of the virus, where most countries around the globe, including Indonesia, had closed schools and other educational institutions.² Through the Circular Letter Number 4 of 2020 issued by the Ministry of Education and Culture of Indonesia regarding the implementation of education policies during the emergency period of the spread of COVID-19, the government closed schools and required the learning process from home (study from -

¹ M.J.S. Díaz, "Emergency Remote Education, Family Support and the Digital Divide in the Context of the Covid-19 Lockdown," *International Journal of Environmental Research and Public Health* 18, no. 15 (2021), <https://doi.org/10.3390/ijerph18157956>.

² S.V. Bennett, "Access to Multicultural Children's Literature During COVID-19," *Reading Teacher* 74, no. 6 (2021): 785–96, <https://doi.org/10.1002/trtr.2003>.



home) through online/distance learning.³ This policy was an effort to continue to provide a learning experience for students even though it was out of the school environment.⁴ Hence, the government did not burden teachers and students to be required to fully complete all the competencies targeted within the national curriculum.

Such policy taken during an emergency situation, in practice, certainly faced its own challenges. First and foremost, both educators and students in general were not prepared for a learning system that switched from face-to-face to online.⁵ This is because teachers as educators are used to teaching systems that involve direct interaction with students without going through digital intermediaries while students have difficulty concentrating or understanding lessons from home.⁶ Another notable challenge faced during the distance learning is in light of the fact that there is a significant gap in the educational facilities or access to technology that is expected to help the learning process that become barriers to creating meaningful learning experience for students.⁷ In other words, the limited educational support facilities owned by teachers and students at home complicate the learning process because the distance learning, in essence, is hugely dependent on the internet network and other supporting modern technologies.⁸ Lastly, while the contribution of parents in providing assistance to their children studying from home is crucial, not all parents are able to do so due to various excuses, such as other

³ Kementerian Pendidikan dan Kebudayaan, “Mendikbud Terbitkan SE Tentang Pelaksanaan Pendidikan Dalam Masa Darurat Covid-19,” 2020, <https://www.kemdikbud.go.id/main/blog/2020/03/mendikbud-terbitkan-se-tentang-pelaksanaan-pendidikan-dalam-masa-darurat-covid19>.

⁴ G.J. Hwang, “Effects of a Social Regulation-Based Online Learning Framework on Students’ Learning Achievements and Behaviors in Mathematics,” *Computers and Education* 160, no. Query date: 2024-03-25 04:54:59 (2021), <https://doi.org/10.1016/j.compedu.2020.104031>.

⁵ Kyndra V. Middleton, “The Longer-Term Impact of COVID-19 on K–12 Student Learning and Assessment,” *Educational Measurement: Issues and Practice* 39, no. 3 (2020): 41–44, <https://doi.org/10.1111/emip.12368>; Henry Aditia Rigianti, “Kendala Pembelajaran Daring Guru Sekolah Dasar Di Kabupaten Banjarnegara,” *Elementary School* 7, no. 2 (2020): 297–302.

⁶ P. Ivars, “A Learning Trajectory as a Scaffold for Pre-Service Teachers’ Noticing of Students’ Mathematical Understanding,” *International Journal of Science and Mathematics Education* 18, no. 3 (2020): 529–48, <https://doi.org/10.1007/s10763-019-09973-4>.

⁷ Lina Handayani, “Keuntungan , Kendala Dan Solusi Pembelajaran Online Selama Pandemi Covid-19 : Studi Ekploratif Di SMPN 3 Bae Kudus,” *Journal Industrial Engineering & Management Research (JIEMAR)* 1, no. 2 (2020): 15–23.

⁸ K. Mukhtar, “Advantages, Limitations and Recommendations for Online Learning during Covid-19 Pandemic Era,” *Pakistan Journal of Medical Sciences* 36, no. Query date: 2024-03-20 02:32:39 (2020), <https://doi.org/10.12669/pjms.36.COVID19-S4.2785>.

responsibilities or work the parents have or because of a lack of motivation and skills in teaching children at home.⁹

The complexity of the challenges faced during the online/distance learning is compounded by the fact that conditions like this have been going on for more than one academic year and are still continuing today.¹⁰ The World Bank released that the potential impact of continuing school closures would result in learning loss among students¹¹. The term learning loss refers to a condition in which general or specific loss of knowledge or skills is generally caused by discontinuities or long gaps in student education, so this term can also be interpreted as the opposite of academic progress.¹² Furthermore, Angrist et al. defines learning loss as a condition where children's knowledge deteriorates or becomes progressively worse over time because the learning that students would have acquired during the normal school year had not occurred due to school closures.¹³ Even though this term has become an issue that is being widely discussed in the world of education due to the impact of the COVID-19 pandemic, in fact, this term is not a term that has just emerged during the COVID-19 pandemic. For example, most public schools in western countries such as the United States and the United Kingdom provide students with summer vacations of up to two and a half months.¹⁴ As a result, there is learning loss among students during the summer holidays. This condition is commonly known as “summer learning loss”.¹⁵ Furthermore, this term is also commonly used in cases of

⁹ Meidawati Suswandari, “The Role Of Parents In Learning At Home During The Covid-19 Pandemic,” *AL-ISHLAH: Jurnal Pendidikan* 14, no. 2 (2022): 2421–28, <https://doi.org/10.35445/alishlah.v14i2.1373>.

¹⁰ J. Li, “Application of Mobile Information System Based on Internet in College Physical Education Classroom Teaching,” *Mobile Information Systems* 2021, no. Query date: 2024-03-20 02:32:39 (2021), <https://doi.org/10.1155/2021/1481070>.

¹¹ World Bank, “The COVID-19 Pandemic: Shocks to Education and Policy Responses,” *World Bank Group Education*, 2020, <https://doi.org/10.12968/bjon.2020.29.8.456>.

¹² the Great Schools Partnership, “LEARNING LOSS,” the Glossary of Education Reform, 2013, <https://www.edglossary.org/learning-loss/>.

¹³ Noam Angrist et al., “Building Back Better to Avert a Learning Catastrophe: Estimating Learning Loss from COVID-19 School Shutdowns in Africa and Facilitating Short-Term and Long-Term Learning Recovery,” *International Journal of Educational Development* 84, no. March (2021): 102397, <https://doi.org/10.1016/j.ijedudev.2021.102397>.

¹⁴ B. Jayson Andrey, “Challenges and Trends of the 21st Century in Higher Education,” *Revista de Ciencias Sociales* 26, no. 2 (2020): 141–54, <https://doi.org/10.31876/rcs.v26i0.34119>.

¹⁵ Trevor Kerry and Brent Davies, “Summer Learning Loss: The Evidence and a Possible Solution,” *Support for Learning* 13, no. 3 (1998): 118–22, <https://doi.org/10.1111/1467-9604.00072>; Jackie Shinwell and Margaret Anne Defeyter, “Investigation of Summer Learning Loss in the UK—Implications for Holiday Club Provision,” *Frontiers in Public Health* 5, no. October (2017): 1–7, <https://doi.org/10.3389/fpubh.2017.00270>.

disrupted formal education as experienced by immigrant children, natural disasters, or global pandemics such as what is currently happening.¹⁶

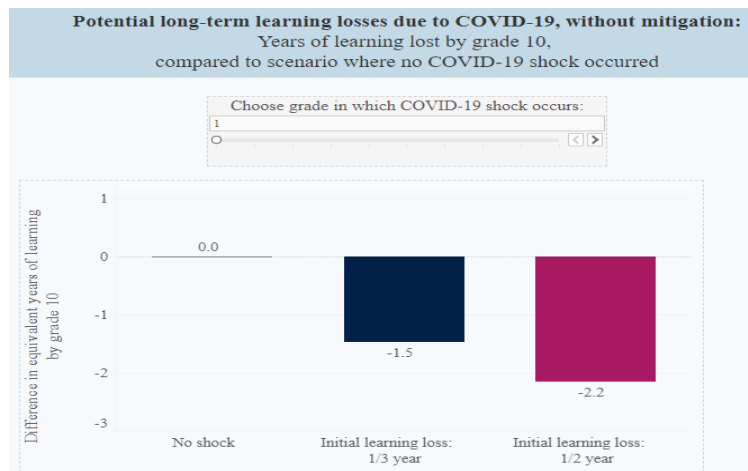


Figure 1
Model of Long-Term Learning Loss Potential that occurs in First Graders
Source :¹⁷

In the context of school closures due to the COVID-19 pandemic, Belafi and Kaffenberger modeled the potential for long-term learning loss as shown in Figure 1, with the potential for learning loss to be more severe at lower grade levels.¹⁸ The purple bar in figure 1 above shows that grade 1 elementary school students who spend just 6 months of study will potentially be left behind by 2.2 years of study. Therefore, mitigation of potential learning loss is needed to prevent further impact. Assessment of student learning levels is one of the first steps in reducing the risk of learning loss phenomena.¹⁹ This aims to ensure the level of knowledge and skills of students as a prerequisite for use at a higher grade level.²⁰

The Minister of Education and Culture of the Republic of Indonesia, Nadiem Makarim, stated that the permanent impact of this learning loss occurs especially for

¹⁶ Tahir Andrabi, Benjamin Daniels, and Jishnu Das, “Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005,” *Journal of Human Resources*, 2021, <https://doi.org/10.3368/jhr.59.2.0520-10887r1>; the Great Schools Partnership, “LEARNING LOSS.”

¹⁷ Carmen Belafi and Michelle Kaffenberger, “Potential Long-Term Learning Losses Due to COVID-19, without Mitigation,” RISE Program, 2020, <https://buildingstatecapability.com/2020/11/09/rise-launches-interactive-data-visualisations-estimating-long-term-learning-losses-from-covid-19-school-closures/>.

¹⁸ Belafi and Kaffenberger.

¹⁹ Andrabi, Daniels, and Das, “Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005”; Belafi and Kaffenberger, “Potential Long-Term Learning Losses Due to COVID-19, without Mitigation.”

²⁰ O. Moliner García, “Bridging the Gap between Theory and Practice: What Strategies University Professors Use in Order to Mobilize Knowledge about Inclusive Education?,” *Educacion XX1* 23, no. 1 (2020), <https://doi.org/10.5944/educxx1.23753>.

generations at a younger education level.²¹ Numeracy is basic knowledge and skills that are taught to students starting from the early child education level as the foundation for advanced learning.²² Some recent research has shown that the COVID-19 pandemic has caused learning loss, particularly greater in numerical skills of various elementary school students.^{23,24} In other words, students at the same level of education do not necessarily have the same level of learning achievement. Therefore, a diagnostic assessment is crucially needed at the beginning of learning to determine the level of learning achievement, especially students' numeracy skills, including students' obstacles and weaknesses during learning from home that is less effective.²⁵ The results of the assessment become a source of information for teachers in determining the appropriate treatment or strategy according to each student's level of numeracy ability.²⁶ In addition, the results of the assessment can also be a reference for teachers in providing remedial or enrichment as a follow-up in an effort to ensure that no students are left behind.²⁷

Based on the foregoing, this study aims to develop a module that can assist and become a reference for teachers in schools in diagnosing and mapping students' numeracy abilities when they return to school. It is expected that the developed module will be able to be used by elementary school teachers in North Kalimantan, as well as in Indonesia broadly, in mapping students' numeracy abilities so that teachers know the level of ability of each student and provide learning according to that level which is commonly known as teaching at the right level.

²¹ Kementerian Pendidikan dan Kebudayaan, "Penyesuaian Keputusan Bersama Empat Menteri Tentang Panduan Pembelajaran Di Masa Pandemi COVID-19," 2020, <https://bersamahadapikورونا.kemdikbud.go.id/pengumuman-penyediaan-kebijakan-pembelajaran-di-masa-pandemi-covid-19/>.

²² G. Falloon, "From Digital Literacy to Digital Competence: The Teacher Digital Competency (TDC) Framework," *Educational Technology Research and Development* 68, no. 5 (2020): 2449–72, <https://doi.org/10.1007/s11423-020-09767-4>.

²³ UNESCO, "Learning Losses from COVID-19 Could Cost This Generation of Students Close to \$17 Trillion in Lifetime Earnings," 2021.

²⁴ Dalit Contini et al., "Who Lost the Most? Mathematics Achievement during the COVID-19 Pandemic," *B.E. Journal of Economic Analysis and Policy* 22, no. 2 (2022): 399–408, <https://doi.org/10.1515/bejeap-2021-0447>.

²⁵ A.D.M. Hawari, "Project Based Learning Pedagogical Design in STEAM Art Education," *Asian Journal of University Education* 16, no. 3 (2020): 102–11, <https://doi.org/10.24191/ajue.v16i3.11072>.

²⁶ P. Morais, "Improving Student Engagement with Project-Based Learning: A Case Study in Software Engineering," *Revista Iberoamericana de Tecnologías Del Aprendizaje* 16, no. 1 (2021): 21–28, <https://doi.org/10.1109/RITA.2021.3052677>.

²⁷ M. Ferreira, "Promoting Sustainable Social Emotional Learning at School through Relationship-Centered Learning Environment, Teaching Methods and Formative Assessment," *Journal of Teacher Education for Sustainability* 22, no. 1 (2020): 21–36, <https://doi.org/10.2478/jtes-2020-0003>.

RESEARCH METHODS

The method used in carrying out this research follows the flow of research and development (research development). This type of research is a process or method used in developing and validating a product design. The product that will be researched and developed through this research is the diagnostic assessment module for the numeracy skills of early elementary school students.

The research and development steps were carried out using the modification and development model.²⁸ In full, Borg & Gall presents the ten steps in R&D which consist of 10 main stages that are summarized in Figure 2 below:

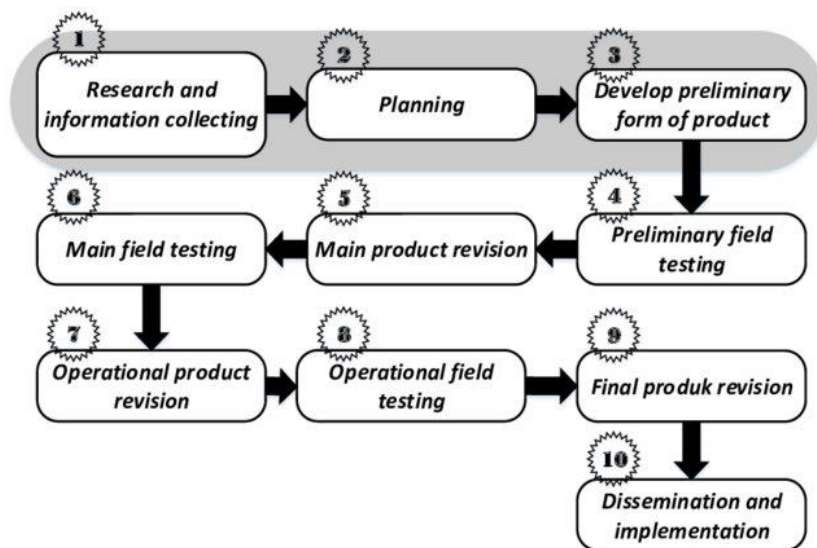


Figure 2
Research and Development Procedures
Source:²⁹

Research and data collection is the first stage which is carried out by collecting data in the form of analysis of teacher needs related to diagnostic assessments at the beginning of learning, in addition to conducting literature and curriculum reviews for the early elementary school grade level. The results of the needs analysis and review of the literature and curriculum will be the initial source of information in designing the student numeration ability assessment module.³⁰

²⁸ Walter R. Borg and Meredith D. Gall, *Educational Research: An Introduction*, 4th Ed. (Longman, 1983).

²⁹ Walter R. Borg and Meredith D. Gall, *Educational Research: An Introduction*, 4th Ed. (Longman, 1983)

³⁰ M. Graven, "Analysing the Citizenship Agenda in Mathematical Literacy School Exit Assessments," *ZDM - Mathematics Education* 55, no. 5 (2023): 1021–36, <https://doi.org/10.1007/s11858-022-01448-1>.

The initial data that has been collected will then be used as a reference in preparing the product plan, namely the diagnostic assessment module that will be designed. This planning activity concerns the parts that will be contained in the module including the form of student numeration assessment to be designed.

The draft assessment module product that will be designed includes administrative parts such as the main cover of the module, preface, table of contents, as well as core parts which include the numerical assessment grid at each level, assessment questions, answer keys and guidelines for coding as well as interpretation and follow-up for each possible student answer.³¹

The initial draft of the assessment module that has been designed will then be validated to assess whether the module design meets the criteria based on the material expert test.

Feedback in the form of suggestions, criticisms, and learning obtained from experts at the validation stage is then followed up by revising to improve the deficiencies or weaknesses of the previously designed modules.

The product is in the form of an assessment module that has been validated and revised, which is then tested on a limited and direct basis in schools that are willing to be involved. The assessment module is given to teachers to use as a guide in providing diagnostic assessments of students' numeracy abilities. Questionnaires related to teacher responses regarding the module are collected as evaluation material for the modules that has been developed.

Based on the results of product trials in the field, if the teacher's response says that this product is interesting and very useful, then it can be said that this product has been developed to produce the final product. However, if the product is not perfect, then the results of this trial are used as material for improvement and refinement of the product made, so that the final product can be produced in the form of a diagnostic assessment module for students' numeracy abilities that is feasible to use.

The product is in the form of a diagnostic assessment module for the numeracy skills of early primary school students who have gone through the series of stages above, which are then ready for mass production and being disseminated as reference material

³¹ I. Mayuni, "Designing Literacy E-Coaching Model For English Language Teachers Of Junior High Schools In Indonesia," *Teflin Journal* 33, no. 2 (2022): 310–29, <https://doi.org/10.15639/teflinjournal.v33i2/310-329>.

for primary school teachers in mapping students' numeracy abilities, especially after the COVID-19 pandemic. This module can then also be used at the beginning of a new school year to determine the level of attainment of the mathematics competence of early grade primary school students.

RESULTS AND DISCUSSION

This development research produced the final product in the form of a diagnostic assessment module for the numeracy skills of early elementary school students. Through an initial study related to the analysis of teacher needs at the beginning of learning after the COVID-19 pandemic, it was found that teachers faced obstacles in teaching material according to the curriculum due to the varying levels of students' numeracy skills. Therefore, a diagnostic assessment related to students' numeracy abilities at the beginning of learning was crucially needed. However, the teachers' difficulty in understanding and carrying out appropriate assessments was an evident obstacle. This fact became the driving force in designing a numeracy assessment module for early grade students in elementary schools. The assessment module was designed to contain information related to the meaning of assessment and the importance of conducting an assessment at the start of learning after the COVID-19 pandemic, stages in preparing and implementing the assessment, as well as the interpretation and follow-up of the assessment results.³²

The modules that have been designed were then given to two experts to be validated regarding the aspects of material, presentation, and graphics.³³ The validation results from the experts are presented in Table 1.

Table 1
Expert Validation Results

Aspects	Expert 1	Expert 2	Average	Category
Content	87.5%	90.0%	88.75%	Very good
Layout	88.3%	91.7%	90.00%	Very good
Graphic design	88.0%	90.0%	89.00%	Very good
Average	87.9%	90.6%	89.25%	Very good

Source : Personal Documents

³² N. Ratnaningsih, "Covid-19 the Earliest for Digital Learning in Mathematics: An Overview from Technology Literacy," *Journal of Physics: Conference Series* 1819, no. 1 (2021), <https://doi.org/10.1088/1742-6596/1819/1/012027>.

³³ A F Nisa et al., "Basic Science Module as a Resource for Independent Learning for Elementary Teacher Education Students in the Pandemic Covid-19," *International Journal of Elementary Education* 6, no. 2 (2022): 213–22, <https://doi.org/10.23887/ijee.v6i2.44444>.

The validation results from the two experts in table 1 show that the assessment module developed as a whole has met the very good criteria for each aspect which was assessed from the material, presentation, and graphic aspects. Even though the results of the expert validation of the assessment module developed showed very good results, there were several notes of improvement from the validator which became material for module revisions, such as adjustments to typography and font size used and also some minor errors in writing words or sentences.

The revised module based on the notes from the validators was then tested on a limited basis at State Elementary School 013 Tarakan involving 1 classroom teacher who was a grade 2 class A teacher. The developed module was given to the teacher to study and then the teacher gave the assessment provided in the module to 25 students and interpreted the results of the student's ability diagnosis using the guidelines provided in the module. This preliminary field trial produced data on teacher responses to the developed module in terms of practicality and effectiveness through a questionnaire. Table 2 is a summary of the results of the teacher's response to the developed module which was collected through a questionnaire.

Table 2
Results of the Teacher's Response to the Developed Module in the Preliminary Field Trial

Aspects	Average	Category
Practicality	87.50%	Very good
Effectiveness	80.00%	Very good
Average	83.75%	Very good

Source : Personal Document

The results on Table 2 above show that the developed module for diagnosing students' numeracy skills is in a very good category in terms of the level of practicality and effectiveness. In addition, the teacher responded very positively to the design of the assessment module that was developed, as admitted by the teacher that she has had difficulties in preparing assessments because most teachers at the school have never conducted a written diagnostic assessment at the beginning of learning. The notes from the teacher regarding the modules developed at the preliminary field testing included the need to adjust the assessment sheets on the modules into worksheets that were ready to be filled out by students, so the teacher only needed to photocopy the sheets and distribute them to the students at the beginning of learning. Product revisions were made again after

this preliminary trial. The revised module was then piloted for full use in the school. Figure 3 below shows the sheets of the assessment modules that have been developed and implemented.

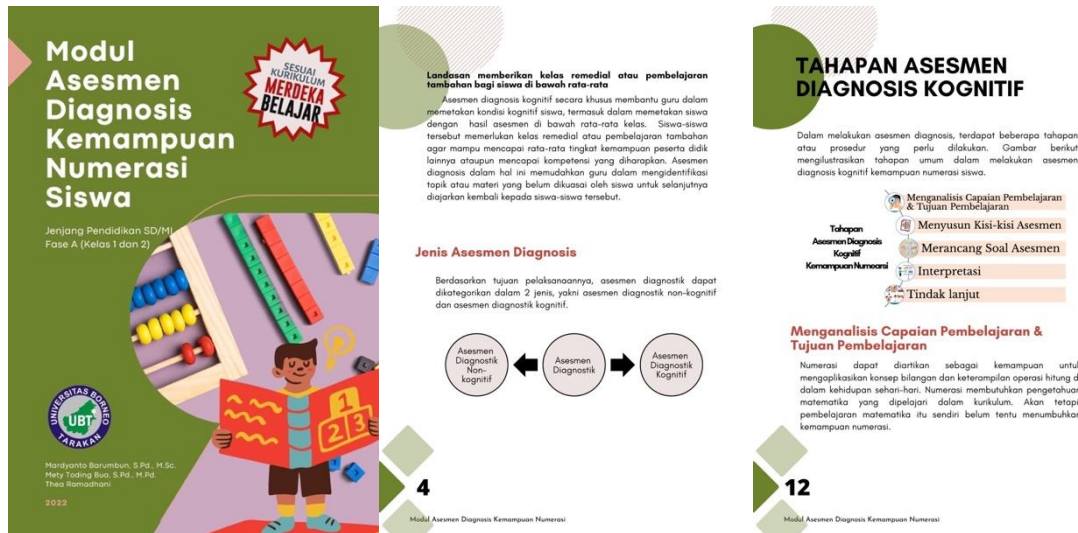


Figure 3
 Diagnosis Assessment Module
 Source: Personal Documents

The implementation of the developed product in the form of an assessment module for diagnosing students' numeracy skills was carried out at one public primary school, State Elementary School 013 Tarakan, North Kalimantan involving 2 teachers who were Grade 1 and Grade 2 classroom teachers, respectively. The participating teachers in this implementation stage were other teachers and involved different classes from the participants in the previous preliminary trial stage. This was done with the aim that the research results were not biased. In the implementation stage, the teachers were given the module that has been developed to study and then asked to design, modify, and fully use the diagnostic assessment tool for early grade students' numeracy abilities. The instrument for diagnosing numeracy skills in this module was designed to enable the achievement of the main objective of implementing an assessment for beginning learners, namely to identify or specifically highlight the weaknesses and strengths of students both individually and in groups, so that interventions could be designed to improve learning,³⁴ as well as to enable teachers to prepare lessons in the best way possible by taking into

³⁴ Margaret Forster, "Literacy and Numeracy Diagnostic Tools: An Evaluation," *Australian Council for Educational Research*, 2019, <https://doi.org/10.2307/j.ctv1b0fvk2.20>.

account the abilities of students.³⁵ After carrying out the assessment, the teacher interpreted or mapped students' numeracy skills according to their levels. Assessment of student learning levels is one of the first steps in reducing the risk of learning loss phenomena^{36,37} due to the COVID-19 pandemic that has lasted for approximately 2 academic years which of course has had an impact on the varying levels of numeracy skills of each student. The results of the assessment become a reference for teachers in carrying out teaching and learning according to the average level of students' numeracy abilities³⁸. This approach is closely related to the differentiated learning approach which provides opportunities for students to learn based on their level of ability (teaching at the right level). These two subject matters are the approach applied in the current curriculum implemented in Indonesia called *Kurikulum Merdeka*.^{39,40}



Figure 4
Implementation of the Diagnostic Assessment Module
Source: Personal Documents

³⁵ John A. C. Hattie, G.avin T.L. Brown, and S.Earl Irving, “An Analysis of an Assessment Tool for 5-Year Old Students Entering Elementary School: The School Entry Assessment Kit,” *New Zealand Journal of Educational Studies* 50, no. 1 (2015): 87–105, <https://doi.org/doi.org/10.1007/s40841-015-0001-4>.

³⁶ Andrabi, Daniels, and Das, “Human Capital Accumulation and Disasters: Evidence from the Pakistan Earthquake of 2005”; Michelle Kaffenberger, “Modelling the Long-Run Learning Impact of the Covid-19 Learning Shock: Actions to (More than) Mitigate Loss,” *International Journal of Educational Development* 81, no. December 2020 (2021): 102326, <https://doi.org/10.1016/j.ijedudev.2020.102326>.

³⁷ Kaffenberger, “Modelling the Long-Run Learning Impact of the Covid-19 Learning Shock: Actions to (More than) Mitigate Loss.”

³⁸ L.D. Alves, “Movement of Understanding of Mathematical Literacy from Montessori’s Perspective: An Approach to the Teaching Processes of Geometry,” *Acta Scientiae* 24, no. 8 (2022): 504–36, <https://doi.org/10.17648/acta.scientiae.7160>.

³⁹ Susan Dewi Cahyono, “Melalui Model Teaching at Right Level (TARL) Metode Pemberian Tugas Untuk Meningkatkan Motivasi Dan Hasil Belajar Peserta Didik Perencanaan Usaha Pengolahan Makanan Awetan Dari Bahan Pangan Nabati Di Kelas X . MIA . 3 MAN 2 Payakumbuh Semester,” *Jurnal Pendidikan Tambusai* 6, no. 2 (2022): 12407–18.

⁴⁰ Purba Mariati et al., *Prinsip Pengembangan Pembelajaran Berdiferensiasi (Differentiated Instruction)*, ed. Mariati Purba, M. Yusri Saad, and Malikul Falah (Pusat Kurikulum dan Pembelajaran, Badan Standar, Kurikulum, dan Asesmen Pendidikan, Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, Republik Indonesia, 2021).

After implementing the developed product as illustrated in Figure 4 above, the teachers were asked to provide responses to the developed module in terms of the practicality and effectiveness by filling out a questionnaire. The summary of the results of the teacher's response to the assessment module at the implementation stage is presented in Table 3.

Table 3
Results of the Teacher's Response to the Developed Module in the Main Field Testing

Aspects	Teacher 1	Teacher 2	Average	Category
Practicality	90.0%	87.5%	88.75%	Very good
Effectiveness	95.0%	92.5%	93.75%	Very good
Average	92.5%	90.0%	83.75%	Very good

Source : Personal Documents

The results of the teacher's response questionnaire show that the diagnostic assessment module developed is feasible to use because of its very good practicality and effectiveness in its use. Furthermore, the teachers gave very positive responses to the module for assessing the numeracy abilities of early grade students because the teachers did not understand the importance of conducting an assessment at the beginning of learning. In fact, the diagnostic assessment has a very crucial role as a means of gathering authentic evidence regarding students' knowledge, skills, and understanding⁴¹ because, just like when students first enter formal education, students returning to school after the COVID-19 pandemic start school with very different experience, understanding, and prior knowledge, as well as significant variations in the development of literacy and numeracy.⁴²

Interruptions to children's education in the form of closing schools for quite a long time, such as during the COVID-19 pandemic, not only cause stagnation but also leads to

⁴¹ Forster, "Literacy and Numeracy Diagnostic Tools:An Evaluation."

⁴² Hattie, Brown, and Irving, "An Analysis of an Assessment Tool for 5-Year Old Students Entering Elementary School: The School Entry Assessment Kit."

degradation in children's academic development.^{43,44,45,46} In fact, the impact of learning loss due to COVID-19 occurs not only as long as children are absent from school but also continuously even when children return to school on a larger and even permanent scale, if not handled swiftly and seriously.^{47,48} Therefore, teachers are expected to be able to mitigate this problem by identifying students' abilities as soon as possible, especially the numeracy abilities of elementary school students at the beginning of learning.⁴⁹ It is hoped that the presence of the assessment module that we have designed will be able to provide elementary school teachers with an understanding of the diagnostic assessment of numeracy skills and the procedures for carrying out the assessment to know further what teachers need to do based on the results of the assessment.

CONCLUSION

Based on the findings above, it is concluded that the assessment module developed in this research is in the appropriate (very good) category, in terms of both practice (88.75%) and effectiveness (93.75%). Thus, it is hoped that the presence of this assessment module can be an answer and solution to teachers' difficulties in understanding and carrying out diagnostic assessments of students' numeracy skills at the beginning of learning. Teachers are also expected to be able to use this module as a reference in designing their own assessments and other important tools for learning.

⁴³ Robin Donnelly and Harry Anthony Patrinos, "Learning Loss during Covid-19: An Early Systematic Review," *Prospects*, no. 0123456789 (2021), <https://doi.org/10.1007/s11125-021-09582-6>.

⁴⁴ Per Engzell, Arun Frey, and Mark D. Verhagen, "Learning Loss Due to School Closures during the COVID-19 Pandemic," in *Proceedings of the National Academy of Sciences of the United States of America*, vol. 118, 2021, <https://doi.org/10.1073/PNAS.2022376118>.

⁴⁵ Jennifer Gore et al., *The Impact of COVID-19 on Student Learning in New South Wales Primary Schools: An Empirical Study*, *Australian Educational Researcher*, vol. 48, 2021, <https://doi.org/10.1007/s13384-021-00436-w>.

⁴⁶ L. Pier et al., "COVID-19 and the Educational Equity Crisis: Evidence on Learning Loss from the CORE Data Collaborative," Policy Analysis for California Education., 2021, <https://edpolicyinca.org/newsroom/covid-19-and-educational-equity-crisis>.

⁴⁷ Belafi and Kaffenberger, "Potential Long-Term Learning Losses Due to COVID-19, without Mitigation."

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We declare that there is no potential conflict of interest related to the research and publication as well as the authorship.

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