# Numeracy E-Module with Edugame As A Support For Mathematics Learning for Sixth-Grade Elementary School Students

**Meira Sagita[1*], Petra Kristi Mulyani[2]**  iD
[1,2] Fakultas Ilmu Pendidikan dan Psikologi, Universitas Negeri Semarang, Semarang, Indonesia

**A R T I C L E   I N F O**

**A B S T R A K**

*Pandemi Covid-19 menyebabkan learning loss salah satunya pada pembelajaran matematika. Siswa menikmati produk teknologi karena pembelajaran daring namun sekolah belum memfasilitasi guru untuk membuat sendiri. Tujuan penelitian ini yaitu menciptakan E-modul numerasi dengan edugame sebagai penunjang pembelajaran matematika untuk siswa kelas VI sekolah dasar Jenis penelitian ini yaitu pengembangan dengan menggunakan metode ADDIE dengan tujuan menghasilkan e-modul yang dapat menunjang pembelajaran yang kurang maksimal akibat learning loss selama pandemi Covid-19. Subjek penelitian terdiri dari 2 kelas dengan 1 kelas berjumlah 10 siswa sebagai kelas kontrol dan 1 kelas yang berjumlah 11 siswa sebagai kelas eksperimen Metode yang digunakan dalam mengumpulkan data yaitu kuesioner dan tes. Instrument pengumpulan data berupa angket dan soal tes. Teknik analisis data menggunakan analisis deskriptif kualitatif, kuantitatif, dan statistik inferensial. Hasil penelitian yaitu e-modul ini sangat layak digunakan sebagai penunjang pembelajaran matematika di kelas VI SD karena mendapat skor validasi dari ahli media sebesar 90,7% dan ahli materi sebesar 86,7% serta respon pengguna sebesar 100%. Selain itu, berdasarkan uji t menunjukan bahwa terdapat perbedaan hasil belajar setelah siswa menggunakan E-modul numerasi dengan edugame. Hasil uji n-gain yaitu 80,3%. Disimpulkan bahwa e-modul ini mempengaruhi dan meningkatkan hasil belajar siswa sehingga layak digunakan dalam pembelajaran.*

**A B S T R A C T**

The Covid-19 pandemic has caused learning loss, one of which is in mathematics learning. Students enjoy technology products because of online learning, but schools must encourage teachers to make their own. This research aimed at developing a numeracy E-module with edugame. This type of research was developed using the ADDIE method to produce e-modules that can support less than optimal learning due to learning loss during the COVID-19 pandemic. The methods used to collect data were questionnaires and tests. Data collection instruments were in the form of questionnaires and test questions. Data analysis techniques used descriptive qualitative, quantitative, and inferential statistical analysis. The research results showed that this e-module was very suitable for use as a support for mathematics learning in sixth-grade elementary school because it received a validation score from media experts of 90.7% and material experts of 86.7% and a user response of 100%. Apart from that, based on the t-test, it showed differences in learning outcomes after students used the numeracy module with edugame. The n-gain test result was 80.3%. It can be concluded that this e-module influences and improves student learning outcome and it is suitable for learning.
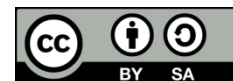
## 1. INTRODUCTION

Mathematics is a learning material for elementary school students (Asbari et al., 2019; Astri et al., 2022). Therefore, it is very important to introduce mathematics from an early age because it is closely related to the events that students encounter every day. Factors that make students experience difficulty in understanding and solving integer arithmetic operations are the need for student interest and motivation to learn (Lily, 2021; Mandasari & Rosalina, 2021). The innovation uses edugames that can be played via cell phone (word wall) during learning. Edugames can increase students' interest in learning while helping elementary school students learn mathematics, especially basic arithmetic operations inside and outside the classroom (Afriyola et al., 2020; Reinaldo et al., 2021). Besides, the technology used in learning also benefits teachers because it can improve their pedagogical abilities (Magdalena et al., 2021; Rafli, 2021). However, there is little interest in studying mathematics because of its difficulty. The low numeracy ability of sixth-grade elementary school students results from the learning process carried out during the COVID-19 period. Teachers play an important role in training, improving, and developing students' numeracy abilities. Everyone involved in the learning process at school,

including principals, parents, students, and teachers, can work together to improve numeracy literacy and technology adaptation in schools (Darwanto, 2022; Pangesti, 2018). For example, schools provide students to access the media, learning tools, and learning resources they need. The sixth-grade teacher at MI, Islamiyah Slinga, has an innovative idea to solve problems in mathematics learning but needs more time and resources to develop it. Based on observations made by researchers, teachers perceived that students seemed enjoy the technology products in delivering material and evaluating. However, teachers choose to refrain from developing technology-based media due to a lack of time and resources due to the teacher's workload. Teachers also observed that students experienced difficulties in learning in the new normal period. When learning occurs face-to-face, and the teacher displays the material, students associate it with games on cell phones that students remember and recognize. However, teachers still need to utilize the association process to make it easier for students to learn the material, causing learning to become diverted. This problem affects student learning outcomes, including at MI Islamiyah Slinga. This statement is demonstrated by the learning outcomes of sixth-grade students, almost half of whom are still below the Minimum Completeness Criteria (KKM). Student learning outcomes in mathematics learning, the PAT (End of Year Assessment) scores for the sixth grade of the 2021/2022 academic year, which the researchers obtained from the sixth-grade teacher at MI Islamiyah Slinga, showed that 13 out of 29 students or 44.83% of students scored below the Minimum Completeness Criteria. (KKM) with a KKM of 70. Then, in the new academic year, the 2022/2023 academic year, for mathematics learning, more or less the same results were obtained. The results obtained by students in daily assessment 1, which was about integers and arithmetic operations, were 22 out of 36 students, or 61.11% of students who still got a score under the Minimum Completeness Criteria (KKM) with a KKM of 70.

The solution to overcome this problem is through innovative learning media. Learning media is very important to help students learn (Lubis & Nuriadin, 2022; A. A. Putri & Ardi, 2021). With learning media, when delivering material in class, students become more interested and motivated in learning. Learning media are teaching aids that help students learn because they can state or make abstract things concrete. The principle is that media is used in learning to create a more efficient and effective communication method. Learning media is software or hardware teachers use to assist teachers in learning (Fahyuni et al., 2020; Zuchdi & Nurhadi, 2019). Media is expected to improve the learning process by learning objectives. In general, educational media has several benefits, clarifying the delivery of information or messages so that they are not too verbalistic and overcome the limitations of space, time, and sensory power, for example, by using pictures, films, and so on to replace objects that are too large; strengthen students' active attitude and encourage them to learn; and based on the character, environment and experiences of various students, learning media can be useful for teachers (D. A. P. Putri, 2019; Suharsiwi et al., 2022). There is a need to develop edugames that are digital media for appropriate learning processes accompanied by direction and supervision from parents and teachers. This research developed digital media in the form of a numeracy e-module for sixth-grade students to prove that this numeracy e-module is suitable for supporting mathematics learning in sixth-grade elementary schools. So, with this numeracy e-module, besides improving students' abilities, this e-module also improves teachers' skills in varying learning using learning media.

Previous research findings stated that interactive e-modules can significantly improve student learning outcomes (D. A. P. Putri, 2019). E-modules have a significant role in the learning process because they can help teachers present learning material. The main advantage of e-modules is their interactive nature and, differentiating them from other print media. E-modules in digital format can be accessed via laptops, computers, and cell phones. Features such as learning videos, animations, images, and audio can be found in e-modules. The interactiveness of the e-module makes navigation easier, allows a combined display of images, text, and video, and is accompanied by automated tests and feedback. Therefore, e-modules are a superior alternative in increasing student understanding and stimulating improved learning outcomes (Pramana et al., 2020; Putra & Agustiana, 2021). Many people have researched e-module development, but from the research and information collection that researchers have carried out, researchers have not find similarities in research with this researcher's research. There has been much previous research on Canva, and the result is that using e-modules in learning can attract students' interest and is suitable for use in elementary school students' learning (Simamora et al., 2019; Winatha, 2018).

The difference with previous research is that the e-module that researchers developed is integrated with edugames created via Wordwall to make the e-module more interactive. There are also many word wall developments. The results of developing wordwalls in mathematics learning in elementary schools that researchers found included increasing learning motivation. The Wordwall application in learning increases student learning outcomes and makes learning more effective. Therefore, researchers chose to integrate the edugame word wall into the e-module. The subjects used in this research differ from previous research, sixth-grade students at MI Islamiyah Slinga, so this research was completely new and different from previous research. This research aimed to create a numeracy e-module with edugames to support sixth-grade mathematics

learning at MI Islamiyah Slinga. The development of a numeracy e-module with this edugame contains material on integers and integer calculation operations which can be accessed via cellphone.

## 2. METHOD

This e-module development research used the ADDIE R&D model (Analyze, Design, Development, Implementation, Evaluation) because this numeracy e-module development research was focused only on making a product testing and evaluating the product being developed (Tegeh, 2014). The analysis stage included activities to analyze students' required competencies student characteristics regarding their knowledge when learning, and analyze material by competency demands. This analysis stage was carried out using interview and documentation methods. The design stage carried out media design based on a questionnaire on teacher and student needs, competencies to be studied through interviews, learning strategies for using technology in the classroom, and carrying out evaluations using edugames. The analytical data collection was carried out using a needs questionnaire instrument, as seen in Table 1.

**Table 1.** Needs Analysis Instrument

| No. | Aspect | Indicator | Question Number | Total |
|-----|--------|-----------|-----------------|-------|
| 1 | Learning | Understanding integer material | 1,3 | 2 |
| | | How to deliver the desired material | 5,6,7,8 | 4 |
| 2 | E-module | Availability of e-modules | 2 | 1 |
| | | E-module content requirements | 4,14 | 2 |
| | | Characteristics of e-modules | 9,10,11,12,13 | 5 |

Next, after the design stage, there was the development stage. This stage consisted of searching and collecting sources or references to develop media and materials, compiling charts, and creating supporting tables. In this research, illustration images were created using the Canva application. Typing was done using the Microsoft Word application and for design purposes using the Canva application, setting the layout using the Canva application, and preparing evaluation instruments using the Microsoft Word application. The development in this research was carried out in the Canva and Wordwall applications. After arriving at the preparation of the evaluation instrument, the next stage that the researcher would carry out is to validate the material experts and media experts. If an expert validator has validated it, then the next stage of this research would be implementation to obtain an overview of the level of efficiency, interest, and effectiveness of learning. Instruments for expert validators can be seen in Table 2 and Table 3.

**Table 2.** Material Validation Instrument

| No. | Aspect | Indicator | Total |
|-----|--------|-----------|-------|
| 1 | Introduction | Clarity of study instructions | 1 |
| | | Clarity of learning indicators | 1 |
| | | Clarity of learning steps | 1 |
| 2 | Contents | Collapse of matter | 1 |
| | | Material coverage | 1 |
| | | Material actualization | 1 |
| | | Material actualization | 1 |
| | | Clarity of included examples | 1 |
| | | Appropriateness of the language used | 1 |
| | | Interesting content | 1 |
| | | Material suitability | 3 |
| 3 | Evaluation | Clarity of instructions in working on questions | 1 |
| | | The questions presented are coherent | 1 |
| | | Difficulty level of questions | 1 |
| | | Matching exercises and tests with learning indicators | 1 |
| | | Balance of question proportions | 1 |
| 4 | Closing | Clarity of summary | 1 |
| | Introduction | Reference presentation | 1 |

(Arsyad & Azhar, 2016)

**Table 3.** Media Validation Instrument

| No. | Aspect | Indicator | Number | Total |
|---|---|---|---|---|
| 1 | Organization | Cohesiveness | 1 | 1 |
| | | Display consistency | 2,6 | 2 |
| | | Format compatibility | 3 | 1 |
| | | Screen density | 8 | 1 |
| | | Simplicity | 5 | 1 |
| | | Empty space | 7 | 1 |
| | | Focused clearly on the goal | 15,18,10 | 3 |
| 2 | Language | Verbal information | 12 | 1 |
| | | Appropriateness of word and sentence fragments on each page | 9 | 1 |
| | | Easy for students to understand | 13 | 1 |
| 3 | Attractiveness | Interactive | 16 | 1 |
| | | Branch out according to student abilities | 17 | 1 |
| | | The presentation format is motivating | 19 | 1 |
| | | The color is attractive | 11 | 1 |
| | | Presentation of images and graphics | 20 | 1 |
| 4 | Usage | Easy to use | 25 | 1 |
| | | Make it easy for students to know how far they have read | 4 | 1 |
| | | Reusable | 23 | 1 |
| | | Documentation is easy and appropriate | 24 | 1 |
| | | The instructions are simple and complete | 21 | 1 |
| | | Readability | 14 | 1 |

(Arsyad & Azhar, 2016)

The feasibility test stage is the media and material feasibility tests. Researchers used a Likert scale measurement scale to test the feasibility of the numeracy e-module with this edugame. The Likert scale is organized into questions followed by five responses indicating each level (Arikunto, 2018). The percentage results of the numeracy e-module feasibility data were then converted to the expert validation interpretation criteria in Table 4.

**Table 4.** Eligibility Criteria

| Eligibility Criteria | Eligibility Level |
|---|---|
| 81% – 100% | Worth It |
| 61% – 80% | Worthy |
| 41% – 60% | Not Eligible |
| 21% - 40% | Not Eligible |
| 0% - 20% | Inadequate |

(Arikunto, 2021)

After testing its feasibility, the next stage was to test the validity of the test instrument, trial questions for students. In this research, construct validity was used. The validity used many tests or non-tests for observation. Each test instrument was tested for validity using the product-moment correlation instrument formula. After the validity test, the next stage was the initial and final data analysis. The initial data analysis was the same as the first analysis stage, while the final data analysis uses the normality test, homogeneity test, t-test, and n-gain test. The n-gain criteria can be seen in Table 5.

**Table 5.** N-Gain Test Criteria

| Score | Criteria |
|---|---|
| $g > 0.7$ | High |
| $0.3 \leq g \leq 0.7$ | Medium |
| $g < 0.3$ | Low |

(Kurniawan, 2021)

Lastly, the evaluation stage was a formative evaluation. The learning media assessment stage was carried out at this evaluation stage by users, teachers and sixth-grade students. Evaluation instruments can be seen in Table 6.

**Table 6.** User Response Instrument

| No. | Aspect | Indicator | Number | Total |
|---|---|---|---|---|
| 1 | Convenience | Clear instructions | 1 | 1 |
| | | Easy to open | 2 | 1 |
| | | It can be accessed easily | 3 | 1 |
| | | Easy when switching pages | 4 | 1 |
| | | Overall, it is easy to use | 5 | 1 |
| | | Basic competencies are clear | 16 | 1 |
| | | Presentation of coherent material | 17 | 1 |
| | | Attractive presentation | 18 | 1 |
| | | Sentences and language are easy to understand | 19 | 1 |
| | | The practice questions are clear | 20 | 1 |
| | | Interesting practice questions | 21 | 1 |
| | | Readable text | 22 | 1 |
| | | Examples support understanding of the material | 23 | 1 |
| | | The test questions are clear | 24 | 1 |
| | | The use of text, audio, images, and edugames supports an understanding of the material | 25 | 1 |
| 2 | Appearance | Matching color | 6,7 | 2 |
| | | The design is attractive and not boring | 8,9 | 2 |
| | | The background and text colors are appropriate and not distracting | 10 | 1 |
| | | The layout is clear and neat | 11 | 1 |
| | | The letters used are interesting | 12 | 1 |
| **No.** | **Aspect** | **Indicator** | **Number** | **Total** |
| | | Spacing is appropriate | 13 | 1 |
| | | The audio on the edugame is appropriate | 14 | 1 |
| | | Every page is orderly and coherent | 15 | 1 |

(Arsyad & Azhar, 2016)

Finally, teachers and students carried out the learning media assessment stage, research data was collected and analyzed, and it was decided whether the learning media is suitable or not to be used in the learning process.

## 3. RESULT AND DISCUSSION

**Result**

The result of this development research was a numeracy e-module with edugame. This e-module was developed using ADDIE research and development methods: analysis, design, development, implementation, and evaluation (Spatioti et al., 2022). The results of the analysis stage were the competencies required of class VI students in the form of core competencies, basic competencies, and indicators from the documentation results. Apart from that, the analysis stage also produced learning objectives adjusted from the analysis of learning objectives, student characteristics from learning outcomes and interviews with teachers, and the basis for designing e-modules from needs analysis. The second stage is design. The result of this design was a draft design of the product to be created and developed, which was prepared based on needs analysis. This draft design was a learning instrument: a learning implementation plan, e-module arrangement plan, and e-module display created in the Canva and Wordwall applications. This design was then poured into a draft e-module, which would be developed based on suggestions from expert validators. The material expert validator assessment results, that the e-module design received a score of 86.7% and was suitable for use with revisions. Then, media experts gave this e-module design a score of 90.7%. The next stage is development. This numeracy e-module was revised and developed according to input from the validator and improving aspects that still need to be improved based on the validation results with the validator. After that, the e-module and learning tools were finally checked. Images of e-modules and edugames can be seen in Figure 1.

The third stage is development, testing questions in the form of 50 multiple-choice questions to find out which questions are valid. This trial was carried out on 15 sixth-grade students, and the results were 3 invalid questions and 47 valid questions. Valid questions are then distributed into practice questions and post-tests. After that, the next stage is implementation. Implementation was carried out in 2 classes, with 1 class of 10 students as the control class and 1 class of 11 as the experimental class. The control class was given a post-test, and the experimental class was given learning treatment assisted by numeracy e-modules with edugame. The result was that students given learning treatment assisted by this e-module had better results than those not. This final data analysis used the Shapiro-Wilk normality test. The results were normal. Therefore, it was continued with a homogeneity test, which resulted in homogeneous results, then continued with the t-test and n-gain test. The results of the normality test, homogeneity test, t-test, and n-gain test can be seen in Tables 7, 8, 9, and 10.
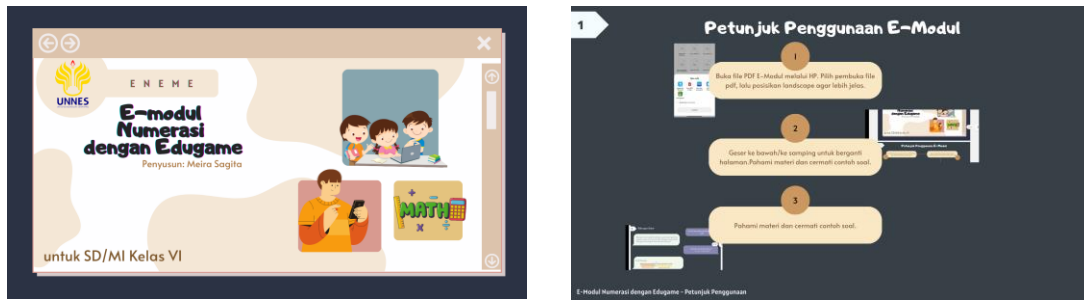


**Figure 1.** Developed E-module

**Table 7.** Normality Test Results (Shapiro-Wilk)

| Shapiro Wilk | Experiment | Control Class |
|---|---|---|
| Df | 10 | 10 |
| Sig. | 0.466 | 0.676 |

**Table 8.** Homogeneity Test Results

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| Postest Result | Based on Mean | 2.079 | 1 | 19 | 0.166 |
| | Based on Median | 2.066 | 1 | 19 | 0.167 |
| | Based on Median and with adjusted df | 2.066 | 1 | 14.650 | 0.172 |
| | Based on trimmed mean | 2.061 | 1 | 19 | 0.167 |

**Table 9.** T-Test Results

| Post-test Result | T | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
|---|---|---|---|---|---|
| Equal variances assumed | 7.550 | 19 | .000 | 23.89091 | 3.16430 |

| Post-test Result | T | Df | Sig. (2-tailed) | Mean Difference | Std. Error Difference |
|---|---|---|---|---|---|
| Equal variances not assumed | 7.356 | 13.881 | .000 | 23.89091 | 3.24796 |

**Table 10.** N-gain Test Results

| Students Name | Post-test Score | PH Score | Post-PH | Ideal-Pre Score | N-gain score | N-gain score (%) |
|---|---|---|---|---|---|---|
| ADP | 100 | 90 | 10 | 10 | 1 | 100 |
| AZK | 92 | 60 | 32 | 40 | 0.8 | 80 |
| DPN | 88 | 60 | 28 | 40 | 0.7 | 70 |
| EBW | 96 | 60 | 36 | 40 | 0.9 | 90 |
| FCN | 84 | 60 | 24 | 40 | 0.6 | 60 |

| Students Name | Post-test Score | PH Score | Post-PH | Ideal-Pre Score | N-gain score | N-gain score (%) |
|---|---|---|---|---|---|---|
| FZA | 88 | 60 | 28 | 40 | 0.7 | 70 |
| HM | 96 | 80 | 16 | 20 | 0.8 | 80 |
| KAAH | 100 | 90 | 10 | 10 | 1 | 100 |
| KHM | 92 | 70 | 22 | 30 | 0.733333 | 73.33333 |
| MDP | 96 | 80 | 16 | 20 | 0.8 | 80 |
| YA | 92 | 60 | 32 | 40 | 0.8 | 80 |
| **Mean** | **93.09091** | **70** | **23.09091** | **30** | **0.80303** | **80.30303** |

This numeracy e-module was revised and developed according to input from the validator and improved aspects that still needed to be improved based on the validation results with the validator. The result is an e-module in the form of a PDF that makes it easy for students to access and flexible in opening so that it can be used in offline and online classes. Apart from that, various edugame links exist for students to practice questions. This e-module comprised 61 pages created in the Canva application with Adigiana Toybox, Alata, and Alatsi fonts. The colors used were a combination of dark and light according to the results of the needs analysis. Edugame was tailored to a selection of games that are readable, varied, and easy to play. After that, e-modules and learning tools are prepared.

Then, the next stage is a trial of 50 multiple-choice questions to determine which questions are valid. This trial was carried out on 15 sixth-grade students, and the results were 3 invalid questions and 47 valid questions. Valid questions are then distributed into practice questions in edugames and post-tests. After that, the next stage is implementation. Implementation was carried out in 2 classes, with 1 class of 10 students as the control class and 1 class of 10 students as the class, the experimental and control classes. The control class was given a post-test, and the experimental class was given learning treatment assisted by numeracy e-modules with edugame. The material expert validator assessment results, that the e-module design received a score of 86.7% and is suitable for use with revisions. Then, media experts gave this e-module design a score of 90.7%. The comparison of the increase in learning outcomes is also proven based on the t-test and the n-gain test with the t-test result (sig. 2-tailed), which is 0.000, which means 0.05, so the meaning of this e-module influences students' knowledge of integer and ngain material which is 80 .3% or g > 0.7, which means this e-module is very suitable for use as a support for mathematics learning in sixth grade.

The final stage is the evaluation stage. This stage involves responses and input from users, teachers and students. This evaluation showed that the teacher and experimental class gave perfect scores for usage responses. Therefore, this numeracy e-module with edugame is suitable to support mathematics learning in sixth-grade elementary schools for integer material. The final stage is the evaluation stage. This stage involves responses and input from users, teachers and students. This evaluation showed that the teacher and experimental class gave a perfect score of 100% for the usage response sheet.

**Discussion**

The research results showed that this e-module is very suitable for use as a support for learning mathematics regarding integers and arithmetic operations. A person's cognitive development process is called learning (Nasrullah et al., 2021; Sari et al., 2021). Learning consists of three cognitive processes: acquiring new information, changing information, and evaluating or testing the relevance and accuracy of knowledge (Hendriani et al., 2023). One way to get new information is by participating in reading books or other relevant sources, listening to teacher presentations, viewing visual content, and so on (Antari & Agustika, 2020; Hae et al., 2021; Sariani et al., 2021). One of the stages of cognitive development is the symbolic stage, which includes mathematics and logic so that learning can be carried out well (Ekawati, 2019). It is important to focus on the four themes of cognitive development so that students can use their knowledge easily. One of these themes is motivation, which is a condition in a person that can encourage him to do something to achieve a goal.

One way that can be used is to use media that utilizes digital technology. In the sixth grade of MI Islamiyah Slinga, it was found that students enjoyed learning using digital media. When learning is supported using digital technology, learning can become more interesting and inspiring. This is because teaching materials that combine images, audio, video, and animation can be more artistic and interesting. It can change the understanding of learning and help children learn better. Thus, learning media can make children learn more effectively. Therefore, it is important to research the development of numeracy e-modules with edugames to support Mathematics learning in the sixth grade of MI Islamiyah Slinga. E-modules are a very effective medium in increasing student enthusiasm and involvement in the learning process in class (Aryawan et al., 2018; Logan et al., 2021). The numeracy e-module with edugame is an e-module designed to support sixth-grade mathematics learning. Numeracy is a person's skill in applying arithmetic operations in everyday life (R. Adawiyah, 2017; Wanelly, 2019). Numeracy is a student's ability to analyze, find reasons, convey ideas effectively, formulate,

solve, and interpret mathematics-related problems in various forms and circumstances (N. Adawiyah et al., 2023; Restian et al., 2023). This numeration is related to whole number material. Currently, the required mathematical or numeracy skills are developing the ability to count and solve numeracy problems in everyday life (Ndakularak et al., 2023). So, studying mathematics is not just about studying numbers but is also related to everyday life, such as arithmetic operations. For example, a student learns to divide one integer by another integer. It requires skills and can be applied in life (Hendriani et al., 2023). The result of this development research is a numeracy e-module with edugame.

The findings of this research are strengthened by previous research findings stating that the edugame wordwall used in this research has been proven to increase student motivation and learning outcomes (Hardian, 2019; Lubis & Nuriadin, 2022). Media in e-modules is suitable for learning support and improving elementary school students' learning outcomes (Hamid et al., 2021; Tharmar & Kalidasan, 2019). The implications of the research results in a numeracy e-module with edugames can be used by teachers, students, schools, and parents to provide direction to improve understanding, mastery of the material, and student learning outcomes so that they become better. Teachers can create e-modules and edugames online through the Canva and Wordwall applications, which can be used easily and flexibly. This mastery can be obtained through training, seminars, or browser tutorials in the form of articles, blogs, or videos on YouTube. The limitation of this research is that during the research process when practicing questions with the edugame contained in the e-module, there were 3 students needing help with network problems, so during implementation, they were left behind when starting the game. Apart from that, the number of research subjects was only 36 students, with details of 15 students in the trial class, 10 students in the control class, and 11 students in the experimental class, so the results of this research do not represent the influence of e-modules in the form of improving learning outcomes for school students basis to the maximum. Suggestions for these limitations are to optimize technical constraints such as networks further and add more research subjects so that the research results can better represent the influence of e-modules on elementary school students' learning outcomes.

## 4. CONCLUSION

The results of research conducted on sixth-grade students at MI Islamiyah Slinga e-module are very suitable for support for learning mathematics regarding integers and arithmetic operations. Students who were given learning treatment assisted by e-modules had better learning outcomes compared to those who were not given the treatment.

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