International Journal of Contextual Science Education (IJCSE)
e-ISSN. xxxx-xxxx
Vol. 1, No. 1, December 2023
pp. 6-10

# Improving Students' Numerical Literacy Through Project-Based Learning (PjBL) in Pascal Programming Course

Muhammad Taufik[1], Joni Rokhmat[2], Muhammad Zuhdi[1]
[1]Physics education study program, Faculty of Teacher Training and Education, Mataram University, Indonesia
[2]Doctoral Program of Science Education, Postgraduate, Mataram University, Indonesia
*Corresponding Author: taufik@unram.ac.id

Accepted: November 15th 2023, Approved: December 11th 2023, Published : December 18th 2023

**Abstract** — Numerical literacy, the ability to interpret and apply numerical data, is crucial for success in various fields, including computer science. Traditionally, Pascal programming courses rely on passive learning methods, hindering students' development of numeracy skills. This study investigated the effectiveness of project-based learning (PjBL) in improving numeracy literacy among 46 Physics Education students enrolled in a Pascal programming course at Mataram University in Indonesia. The PjBL approach involved real-world projects requiring students to apply and analyze numerical data within their programming tasks. Findings revealed significant improvements in numeracy literacy, with success rates of 97% for short analysis, 87% for medium analysis, and 46% for long analysis. Overall, the average learning outcome was 84 out of 100, demonstrating the potential of PjBL as an effective learning model for enhancing numeracy skills in programming contexts. Further research is encouraged to refine PjBL implementation models and optimize its impact on numeracy literacy in STEM education.

Keywords: Project-based learning, Pascal programming, numerical literacy, computer science education.

How to Cite— Taufik, M., Rokhmat, J., & Zuhdi, M. (2024). Improving Students' Numerical Literacy Through Project-Based Learning (PjBL) in Pascal Programming Course . International Journal of Contextual Science Education, 1(1), 6-10. https://jurnalpasca.unram.ac.id/index.php/ijcse/article/view/549

## 1. Introduction

Literacy and numeracy are prioritized areas for the Indonesia government in its human resource development initiatives. Yet, several studies have highlighted Indonesia's relatively low rankings in these domains. In response, the government has enacted regulations mandating the integration of literacy and numeracy into the national education curriculum [1].

According to the Organisation for Economic Co-operation and Development (OECD), the top five countries with the highest numeracy literacy skills, as measured by the 2015 Programme for International Student Assessment (PISA), are Singapore (556 score, exceeding the average of 493), followed by Japan (538), Estonia (534), Chinese Taipei (532), and Finland (531) [2].

Despite recent efforts, Indonesia's numeracy literacy skills require further development. Indonesian students' performance on the Programme for International Student Assessment (PISA) mathematics literacy module has not experienced significant improvement between 2009 and 2015. In 2009, Indonesia ranked 68th out of 74 participating countries, followed by a modest improvement to 64th out of 65 countries in 2012. While the 2015 PISA data indicate a slight upward trend, placing Indonesia at 63rd out of 72 countries, the overall level of proficiency remains concerning [2].

Several Indonesian universities, including Universitas Mataram, have implemented initiatives to strengthen students' reading and numeracy skills. One such initiative at Universitas Mataram is the integration of computer programming courses within the physics education undergraduate program.

Within the Faculty of Education and Science (FKIP) at Mataram University, the undergraduate Physics Education curriculum includes a mandatory one-semester computer programming course (two credits). This course is offered in the fifth semester and requires prior completion of foundational courses in physics and mathematical physics.

Within the realm of computer programming courses lies a unique opportunity for students to enhance both their knowledge and numeracy skills. This occurs through the iterative processes of code construction, problem-solving, and line-by-line execution of programming commands. Programming refers to a set of processes of writing, testing and correcting the program code aimed at creating a program that can do certain works in accordance with the programmer's instructions, it requires the mastery of algorithms, logic and programming languages[3].

Developed by Niklaus Wirth in 1971, Pascal is a procedural programming language renowned for its emphasis on structured programming. Although often employed in introductory programming courses due to its clarity and rigor, Pascal's versatility extends beyond academia. Notable applications include system programming, scientific computing, data analysis, and educational platforms[4].

Countries/economies with a mean performance/share of top performers **above** the OECD average
Countries/economies with a share of low achievers **below** the OECD average

Countries/economies with a mean performance/share of top performers/share of low achievers not significantly different from the OECD average

Countries/economies with a mean performance/share of top performers **below** the OECD average
Countries/economies with a share of low achievers **above** the OECD average

| | Science | | Reading | | Mathematics | | Science, reading and mathematics | |
|---|---|---|---|---|---|---|---|---|
| | Mean score in PISA 2015 | Average three-year trend | Mean score in PISA 2015 | Average three-year trend | Mean score in PISA 2015 | Average three-year trend | Share of top performers in at least one subject (Level 5 or 6) | Share of low achievers in all three subjects (below Level 2) |
| | Mean | Score dif. | Mean | Score dif. | Mean | Score dif. | % | % |
| OECD average | 493 | -1 | 493 | -1 | 490 | -1 | 15.3 | 13.0 |
| Singapore | 556 | 7 | 535 | 5 | 564 | 1 | 39.1 | 4.8 |
| Japan | 538 | 3 | 516 | -2 | 532 | 1 | 25.8 | 5.6 |
| Estonia | 534 | 2 | 519 | 9 | 520 | 2 | 20.4 | 4.7 |
| Chinese Taipei | 532 | 0 | 497 | 1 | 542 | 0 | 29.9 | 8.3 |
| Finland | 531 | -11 | 526 | -5 | 511 | -10 | 21.4 | 6.3 |
| Macao (China) | 529 | 6 | 509 | 11 | 544 | 5 | 23.9 | 3.5 |
| Canada | 528 | -2 | 527 | 1 | 516 | -4 | 22.7 | 5.9 |
| Viet Nam | 525 | -4 | 487 | -21 | 495 | -17 | 12.0 | 4.5 |
| Hong Kong (China) | 523 | -5 | 527 | -3 | 548 | 1 | 29.3 | 4.5 |
| B-S-J-G (China) | 518 | m | 494 | m | 531 | m | 27.7 | 10.9 |
| Korea | 516 | -2 | 517 | -11 | 524 | -3 | 25.6 | 7.7 |
| New Zealand | 513 | -7 | 509 | -6 | 495 | -8 | 20.5 | 10.6 |
| Slovenia | 513 | -2 | 505 | 11 | 510 | 2 | 18.1 | 8.2 |
| Australia | 510 | -6 | 503 | -6 | 494 | -8 | 18.4 | 11.1 |
| United Kingdom | 509 | -1 | 498 | 2 | 492 | -1 | 16.9 | 10.1 |
| Germany | 509 | -2 | 509 | 6 | 506 | 2 | 19.2 | 9.8 |
| Netherlands | 509 | -5 | 503 | -3 | 512 | -6 | 20.0 | 10.9 |
| Switzerland | 506 | -2 | 492 | -4 | 521 | -1 | 22.2 | 10.1 |
| Ireland | 503 | 0 | 521 | 13 | 504 | 0 | 15.5 | 6.8 |
| Belgium | 502 | -3 | 499 | -4 | 507 | -5 | 19.7 | 12.7 |
| Denmark | 502 | 2 | 500 | 3 | 511 | -2 | 14.9 | 7.5 |
| Poland | 501 | 3 | 506 | 3 | 504 | 5 | 15.8 | 8.3 |
| Portugal | 501 | 8 | 498 | 4 | 492 | 7 | 15.6 | 10.7 |
| Norway | 498 | 3 | 513 | 5 | 502 | 1 | 17.6 | 8.9 |
| United States | 496 | 2 | 497 | -1 | 470 | -2 | 13.3 | 13.6 |
| Austria | 495 | -5 | 485 | -5 | 497 | -2 | 16.2 | 13.5 |
| France | 495 | 0 | 499 | 2 | 493 | -4 | 18.4 | 14.8 |
| Sweden | 493 | -4 | 500 | 1 | 494 | -5 | 16.7 | 11.4 |
| Czech Republic | 493 | -5 | 487 | 5 | 492 | -6 | 14.0 | 13.7 |
| Spain | 493 | 2 | 496 | 7 | 486 | 1 | 10.9 | 10.3 |
| Latvia | 490 | 1 | 488 | 2 | 482 | 0 | 8.3 | 10.5 |
| Russia | 487 | 3 | 495 | 17 | 494 | 6 | 13.0 | 7.7 |
| Luxembourg | 483 | 0 | 481 | 5 | 486 | -2 | 14.1 | 17.0 |
| Italy | 481 | 2 | 485 | 0 | 490 | 7 | 13.5 | 12.2 |
| Hungary | 477 | -9 | 470 | -12 | 477 | -4 | 10.3 | 18.5 |
| Lithuania | 475 | -3 | 472 | 2 | 478 | -2 | 9.5 | 15.3 |
| Croatia | 475 | -5 | 487 | 5 | 464 | 0 | 9.3 | 14.5 |
| CABA (Argentina) | 475 | 51 | 475 | 46 | 456 | 38 | 7.5 | 14.5 |
| Iceland | 473 | -7 | 482 | -9 | 488 | -7 | 13.2 | 13.2 |
| Israel | 467 | 5 | 479 | 2 | 470 | 10 | 13.9 | 20.2 |
| Malta | 465 | 2 | 447 | 3 | 479 | 9 | 15.3 | 21.9 |
| Slovak Republic | 461 | -10 | 453 | -12 | 475 | -6 | 9.7 | 20.1 |
| Greece | 455 | -6 | 467 | -8 | 454 | 1 | 6.8 | 20.7 |
| Chile | 447 | 2 | 459 | 5 | 423 | 4 | 3.3 | 23.3 |
| Bulgaria | 446 | 4 | 432 | 1 | 441 | 9 | 6.9 | 29.6 |
| United Arab Emirates | 437 | -12 | 434 | -8 | 427 | -7 | 5.8 | 31.3 |
| Uruguay | 435 | 1 | 437 | 5 | 418 | -3 | 3.6 | 30.8 |
| Romania | 435 | 6 | 434 | 4 | 444 | 10 | 4.3 | 24.3 |
| Cyprus[1] | 433 | -5 | 443 | -6 | 437 | -3 | 5.6 | 26.1 |
| Moldova | 428 | 9 | 416 | 17 | 420 | 13 | 2.8 | 30.1 |
| Albania | 427 | 18 | 405 | 10 | 413 | 18 | 2.0 | 31.1 |
| Turkey | 425 | 2 | 428 | -18 | 420 | 2 | 1.6 | 31.2 |
| Trinidad and Tobago | 425 | 7 | 427 | 5 | 417 | 2 | 4.2 | 32.9 |
| Thailand | 421 | 2 | 409 | -6 | 415 | 1 | 1.7 | 35.8 |
| Costa Rica | 420 | -7 | 427 | -9 | 400 | -6 | 0.9 | 33.0 |
| Qatar | 418 | 21 | 402 | 15 | 402 | 26 | 3.4 | 42.0 |
| Colombia | 416 | 8 | 425 | 6 | 390 | 5 | 1.2 | 38.2 |
| Mexico | 416 | 2 | 423 | -1 | 408 | 5 | 0.6 | 33.8 |
| Montenegro | 411 | 1 | 427 | 10 | 418 | 6 | 2.5 | 33.0 |
| Georgia | 411 | 23 | 401 | 16 | 404 | 15 | 2.6 | 36.3 |
| Jordan | 409 | -5 | 408 | 2 | 380 | -1 | 0.6 | 35.7 |
| Indonesia | 403 | 3 | 397 | -2 | 386 | 4 | 0.8 | 42.3 |
| Brazil | 401 | 3 | 407 | -2 | 377 | 6 | 2.2 | 44.1 |
| Peru | 397 | 14 | 398 | 14 | 387 | 10 | 0.6 | 46.7 |
| Lebanon | 386 | m | 347 | m | 396 | m | 2.5 | 50.7 |
| Tunisia | 386 | 0 | 361 | -21 | 367 | 4 | 0.6 | 57.3 |
| FYROM | 384 | m | 352 | m | 371 | m | 1.0 | 52.2 |
| Kosovo | 378 | m | 347 | m | 362 | m | 0.0 | 60.4 |
| Algeria | 376 | m | 350 | m | 360 | m | 0.1 | 61.1 |
| Dominican Republic | 332 | m | 358 | m | 328 | m | 0.1 | 70.7 |

Fig. 1. Snapshot of performance in science, reading and mathematics

In general, Pascal programs have two structural parts, namely the header and body of the program. The header is the part where the program title, unit calls, and declarations (variables, procedures, functions, etc.) are placed. The body is the part where the commands that will become the main program when executed are written. Every time you write a program in the Pascal language, the writing structure that you will always use is as follows[5] :

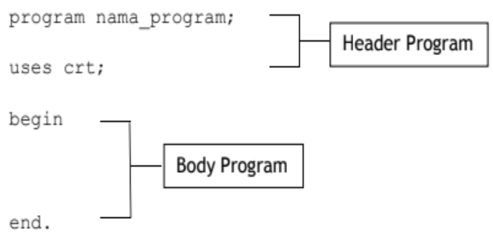


Fig. 2. Pascal Program Structure

This figure shows the general structure of a Pascal program. The program is divided into two main parts: the header and the body. Header is the part of the program that contains the program title, unit calls, and declarations. The program title is a short identifier that is used to identify the program. Unit calls are used to import code from other units. Declarations are used to define variables, procedures, and functions. Body is the part of the program that contains the executable code. The executable code is the code that is executed when the program is run. Specific Elements of the program structure are as follows: Program: This is the keyword that indicates the beginning of a Pascal program; Identifier: This is the name of the program; Uses: This keyword is used to list the units that are used by the program; Var: This keyword is used to declare variables; Procedure: This keyword is used to declare procedures; Function: This keyword is used to declare functions; Begin: This keyword indicates the beginning of the body of the program; End: This keyword indicates the end of the body of the program. The program structure is the foundation of any Pascal program. By understanding the program structure, you can write more efficient and effective Pascal programs[5].

The program in figure 3 below, converts a temperature from Celsius to Reamur and Fahrenheit. The program first declares three variables, celsius, reamur, and fahrenheit, to store the input temperature in Celsius, the output temperature in Reamur, and the output temperature in Fahrenheit, respectively.

```
program convert_celsius_to_fahrenheit;

{ Declare variables }
var
  celsius : real;
  fahrenheit : real;

{ Calculate fahrenheit from celsius }
function convert_celsius_to_fahrenheit(celsius : real) : real;
begin
  convert_celsius_to_fahrenheit := celsius * 9 / 5 + 32;
end;

{ Main program }
begin
  { Prompt user for input }
  write('Enter temperature in Celsius: ');
  readln(celsius);

  { Convert to Fahrenheit }
  fahrenheit := convert_celsius_to_fahrenheit(celsius);

  { Print output }
  writeln('Temperature in Fahrenheit: ', fahrenheit);
end.
```

Fig. 3 Example of Pascal Program

The teaching of the Pascal programming language has traditionally used a lecture-based approach. The lecturer provides a broad overview of what Pascal programming is and provides some examples. This is then followed by discussion and practical exercises.

Traditional computer programming instructional methods, often reliant on lectures, drills, and textbook exercises, while laying a foundational understanding, fall short in bridging the gap between theoretical knowledge and practical application. This disconnection between theory and practice can hinder student comprehension and limit their success in the field. Consequently, it is imperative to move beyond conventional approaches and integrate more engaging, contextually relevant methods to enhance numeracy literacy. By bridging this gap, we empower students to confidently navigate the complexities of computer science and become valuable contributors to the digitally driven future.

Within this context, project-based learning (PjBL) emerges as a compelling alternative, placing students at the heart of the learning process through engaging projects rooted in real-world challenges. This innovative framework positions the student as both the driver and architect of their knowledge, empowering them to work autonomously on self-directed learning projects [6].

Project-based learning (PjBL) constitutes an educational approach that empowers students to actively shape their learning journey. This involves designing learning activities, collaborating on meaningful projects, and ultimately culminating in the creation of a tangible work product for presentation to others [7].

Project-based learning (PjBL) offers a multitude of advantages for student development: a)Knowledge Acquisition and Skill Development: Students actively explore new information and refine their abilities through practical application; b)Enhanced Problem-Solving: PjBL fosters critical thinking and creative problem-solving skills, equipping students to tackle complex real-world challenges; c)Real-World Application: Projects often culminate in tangible products or services, allowing students to directly experience the consequences and impact of their work; d)Resource Management: Students learn to effectively manage project resources, including materials, tools, and time, developing valuable organizational skills; e)Collaboration and Communication: Group projects promote teamwork, communication, and interpersonal skills, essential for success in various professional settings; f)Autonomy and Responsibility: PjBL encourages student agency, as they actively participate in decision-making, framework development, and solution design; h)Open-Ended Inquiry: Project-based learning embraces open-ended problems without predetermined solutions, allowing students to experiment and creatively develop their own processes for achieving desired outcomes; i)Information Literacy: Students learn to effectively gather, analyze, and manage information, developing strong research and critical thinking skills; j)Continuous Assessment and Feedback: PjBL incorporates ongoing self-assessment and peer review, providing valuable feedback for continuous improvement; k)Tolerance for Error: The project-based environment embraces experimentation and welcomes mistakes as opportunities for learning and growth. [8].

Project-based learning (PjBL) is a pedagogical approach that engages students in the process of solving real-world problems. PjBL is based on five phases: a)Planning: Students identify a problem or question that they want to investigate; b)Research: Students conduct research to learn more about the problem or question; c)Data collection and analysis: Students collect and analyze data to answer the problem or question; d)Conclusion: Students draw a conclusion from their research; f)Presentation:

Students present their findings to an audience[9]. Group project work requires students to communicate their ideas and insights to complete the project[10].

In the context of computer programming education, PjBL can be used to help students develop their problem-solving, critical thinking, and collaboration skills. PjBL projects can be designed to address a variety of topics, such as data science, artificial intelligence, or software development.

In addition to the five phases of PjBL, teamwork is also an important component of this approach. When students work together on projects, they must communicate their ideas and collaborate to achieve a common goal. This can help students develop their communication and interpersonal skills.

The following are some specific examples of how PjBL can be used in computer programming education: a) Students could work together to design and implement a new mobile app; b)Students could work together to create a data visualization that illustrates a real-world phenomenon. c).Students could work together to develop an artificial intelligence algorithm that solves a problem.

PjBL is a promising approach to computer programming education that can help students develop the skills they need to succeed in the 21st century.

## 2 Methodology

This study employed a post-test only design to investigate the effectiveness of project-based learning (PjBL) in enhancing numeracy literacy within a Pascal programming course at Mataram University, Indonesia. The participants were 46 undergraduate students enrolled in the Physics Education program, conveniently sampled from three program classes (A, B, and C) within the same cohort.

PjBL Intervention: All 46 participants engaged in the PjBL intervention for the duration of the Pascal programming course (14 weeks). Students were assigned real-world projects focusing on various engineering or scientific themes, requiring them to apply and analyze numerical data within their program development tasks. The projects were scaffolded with instructional resources, guided practice exercises, and feedback mechanisms to support their learning process.

Post-test and Data Analysis: At the end of the course, all participants completed a standardized numeracy assessment as the sole data collection point. The post-test scores were analyzed using descriptive statistics, including measures of central tendency (mean, median) and variability (standard deviation, variance).

## 3. Results and Discussion

### 3.1 Results

This study presents an analysis of numerical literacy within computer programming problems classified as short, medium, and long, alongside the learning outcomes for physics education students enrolled in classes A, B, and C within the Bachelor's Degree Program at the Faculty of Teacher Training and Education, Mataram University. These findings are further detailed in Figures 4,5,6,7 and 8.

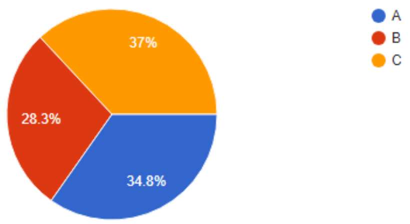


Fig. 4. Responden of the research

The following are examples of two questions that received the most correct answers from students. The percentage of students who properly answered Pascal programming questions with numerical literacy and a short analysis was 45/46, or 97.8%. The medium analysis received a percentage of 40/46 or 87%, whereas the long analysis received a percentage of 21/46 or 45.6% of correct answers.

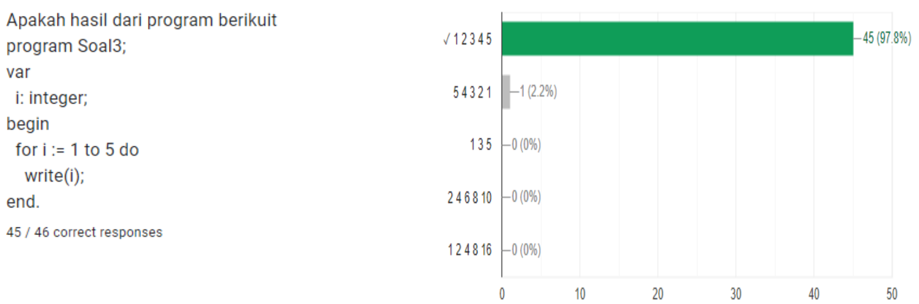


Figure 5. the percentage of correct answers was 45 out of 46 respondents

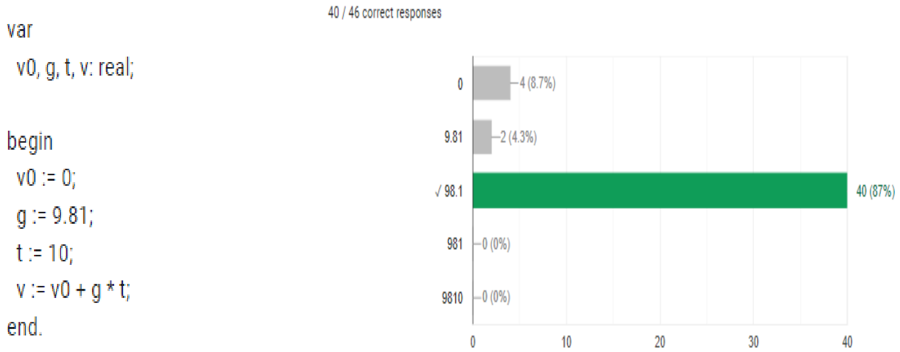


Figure 6. the percentage of correct answers was 41 out of 46 respondents

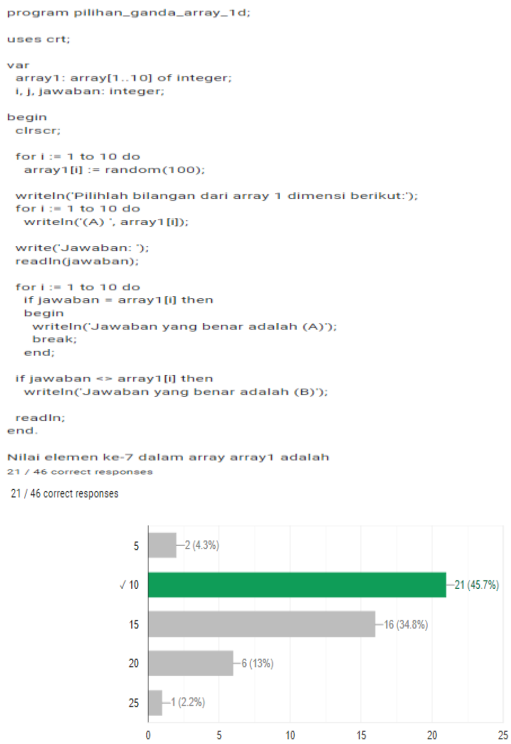


Figure 7. the percentage of correct answers was 21 out of 46 respondents

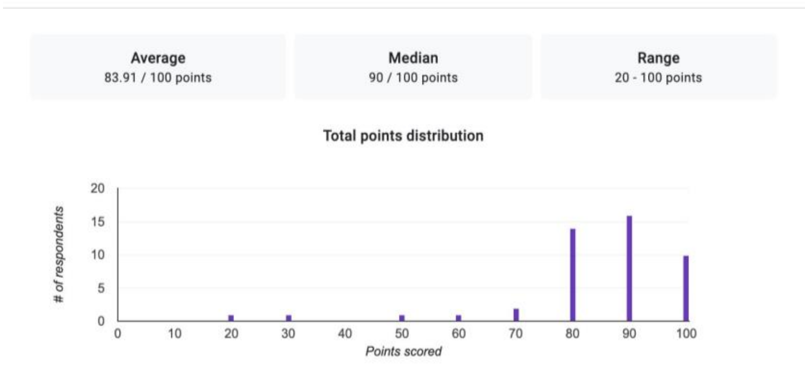


Figure 8. Learning Outcomes for Programming Languages in Classes A, B, and C

### 3.2 Discussion

The PjBL approach implemented in this study yielded significant improvements in students' numeracy literacy across all three analysis categories:

1. Short analysis: With a 97% success rate, students demonstrated strong confidence and accuracy in handling fundamental

numerical tasks within their programming projects. This suggests that PjBL effectively facilitated the comprehension and application of basic numerical concepts in programming contexts.

2. Medium analysis: At 87% success, students displayed competence in tackling moderately complex numerical challenges presented in the PjBL projects. This indicates that the active learning environment nurtured their analytical skills and ability to apply numerical concepts to solve problems of moderate difficulty.
3. Long analysis: While the 46% success rate in long analysis tasks suggests room for improvement, it still marks a notable increase compared to pre-PjBL assessments. This highlights the potential of PjBL to equip students with the skills needed to navigate intricate problem-solving scenarios involving complex numerical data. However, it also indicates that further refinement of the PjBL approach or additional scaffolding may be necessary to optimize support for higher-level problem-solving tasks.

These findings align with research on the effectiveness of PjBL in STEM education, suggesting that active learning, real-world problem-solving, and collaboration opportunities fostered by PjBL projects contribute to enhanced numeracy skills. The observed improvements in various analysis categories point to the multi-faceted impact of PjBL on students' development of numerical confidence, analytical abilities, and problem-solving skills.

Further Discussion Points: Project design: Exploring the impact of different project types and complexity levels on numeracy skill development; Scaffolding strategies: Investigating the effectiveness of specific scaffolding approaches to further support students in tackling complex numerical challenges; Long-term impact: Assessing the sustainability of PjBL-driven numeracy improvements through longitudinal studies following students beyond the course; Interdisciplinary applications: Investigating the potential of PjBL across different STEM disciplines for broader application and impact.

By addressing these discussion points and exploring avenues for further research, we can refine and optimize the implementation of PjBL, maximizing its potential to empower future generations of STEM graduates with the critical numeracy skills needed to thrive in the data-driven world.

## 4.Conclusion

This study provides compelling evidence for the effectiveness of PjBL in fostering numeracy literacy within Pascal programming courses. The significant improvements observed in students' ability to analyze and apply numerical data in real-world contexts highlight the transformative potential of this active learning approach. By implementing PjBL, students in this study achieved an average learning outcome of 84 out of 100, with 97% success in short analysis tasks, 87% in medium analysis, and 46% in long analysis. These results demonstrate the effectiveness of PjBL in equipping students with not only fundamental numerical skills but also the ability to tackle complex problem-solving scenarios involving numerical data.

Integrating PjBL into STEM education, particularly in countries like Indonesia where numeracy literacy poses a persistent challenge, can offer a valuable solution. By equipping future generations with the critical numerical skills essential for success in the data-driven world, PjBL holds the power to empower students not only in their academic pursuits but also in their future careers. Further research on refining PjBL implementation models and assessing its long-term impact remains crucial to optimize its effectiveness and ensure its broader adoption in the landscape of STEM education.

## Acknowledgment

The success of this course would not have been possible without the invaluable support of the Head of the Physics Education Study Program at FKIP Mataram University, who placed their trust in my instructional abilities. I am also deeply grateful to the exemplary teaching team and to the enthusiastic students who made this learning experience truly rewarding.

## References

[1] Ragil, Yoga Aditia., Astuti Reni Intan Puji 2023. Al-Athfaal: Jurnal Ilmiah Pendidikan Anak Usia Dini Vol.06 No.1 (2023) 42-53
[2] OECD. 2018. PISA 2015 Result. https://www.oecd.org/pisa/pisa-2015-results-in focus.pdf
[3] Harimurti,Rina, et.all,2019. Jurnal Pendidikan Teknologi dan Kejuruan, Vol. 25, No. 1, May 2019, 43-51. DOI: 10.21831/jptk.v25i1.22638
[4] Dianta, 2021. Logika dan Algoritma Untuk Merancang Aplikasi Komputer. Yayasan Prima Agus Teknik, Semarang.
[5] Niko M, 2018. Buku Saku Praktikum : Bahasa Pemrograman Pascal, Creative Commons Attribution-ShareAlike 4.0 International
[6] Trianto, 2012. Model Pembelajaran Terpadu: Konsep, Strategi, dan Implementasinya dalam Kurikulum Tingkat Satuan Pendidikan (KPS). Bumi Aksara, Jakarta.
[7]. Suparno, Paul. 2007. Metodologi Pembelajaran Fisika Konstruktivistik dan Menyenangkan. UNIV SANATA DHARMA. Yogyakarta:
[8]. Fathurrohman. 2016. Strategi Belajar Mengajar. PT Refika Aditama. Bandung.
[9]. Turgut, H. (2008). Prospective Science Teachers' Conceptualizations About Project Based Learning. International Journal Of Instruction, 1(1), 61–79.
[10]. Maudi, N. (2016). Implementasi Model Project Based Learning Untuk Meningkatkan Kemampuan Komunikasi Matematis Siswa. Jurnal Pendidikan Matematika Indonesia, 1(1), 39–43