



Repackaging Character Literacy and Numeracy-Oriented RADEC Learning Model Through Teacher Professional Development Program

*I Gunawan¹, W Sopandi¹, H Handayani^{1,2}, N Fatonah¹, I Suhendra¹, Y Maulana¹

¹Elementary Education Study Program, School of Postgraduate Studies, Indonesia University of Education, Indonesia

²Elementary School Teacher Education, STKIP PGRI Purwakarta, Indonesia

Article Info

Article history:

Received October 3, 2023

Revised December 18, 2023

Accepted December 30, 2023

Available Online December 31, 2023

Keywords:

Lesson plan;
Numeracy;
RADEC learning model;
Teacher professional
development;
Workshop;

ABSTRACT

A number of literature state that numeracy and literacy skills are the initial capital for every individual to be able to learn. However, it is known that teachers still experience difficulties in teaching character, literacy and numeracy to students in the learning process. This research was conducted to transfer abilities to teachers to design learning with student worksheets which integrate the Read, Answer, Discuss, Explain, and Create (RADEC) learning model. The research model used in this research is Educational Design Research (EDR) since in the research an intervention will be carried out in the form of a workshop on preparing RADEC-based learning designs at Private Elementary Labschool UPI Purwakarta while in several previous studies EDR was also conducted through interventions such as professional development activities in the form of workshop. At the workshop stage itself, numeracy indicators were explained in detail and thoroughly with guidance from the Guide to Strengthening Literacy and Numeracy in Schools. In relation to numeracy, teachers' understanding of numeracy competency is still not comprehensive but on the other hand, surprisingly the teachers were able to integrate numeracy indicators in the lesson plan of non-mathematic subject. Overall, through RADEC learning model, all teachers be able to select appropriate spoken, written, or visual texts or resources based on their individual students' needs and interests. As a result, they can make the necessary changes to the syllabus's contents; choose the best methods, approaches, and techniques to use; plan the most appropriate activities to carry out; and select, design, or adapt the teaching materials.



Check for updates



OPEN ACCESS



<https://doi.org/10.46627/silet>

INTRODUCTION

Good literacy and numeracy skills will help students learn and read more easily and increase the child's level of success at school. A number of literature state that numeracy and literacy skills are the initial capital for every individual to be able to learn. Numeracy can be achieved by building relationships between non-contextual and contextual tasks (Hapsari, 2019; Kolar & Hodnik, 2021). However, the importance of character, literacy and numeracy does not seem to be fully realized. Based on research results, it is known that the literacy skills of Indonesian people are still minimal, this is shown by Indonesia's still low interest in reading and writing (PISA, 2018) and the adult literacy rate is only 65.5%. In this regard, the Minimum Competency Assessment policy was formed in reaction to low PISA scores among Indonesian students (Machromah et al., 2021). Therefore, numeracy literacy skills are a mandatory ability that every individual must have.



Based on the results of field studies obtained from interview data with the principal of Private Elementary Lab School UPI Purwakarta, it is known that teachers still experience difficulties in teaching character, literacy, and numeracy to students in the learning process. This difficulty is in the form of teacher confusion in implementing the selection of appropriate learning materials that can be integrated for the development of students' character, literacy, and numeracy (CLN). This then has an impact on the lack of optimal development of character, literacy and numeracy of students at the school. Based on these findings, teachers are considered to need to simulate various strategies in their implementation and this requires serious thought because it is a challenge for researchers in the field of education and teacher competency development (Chudasama, 2021; Guerrero-Hernandez & Fernandez-Ugalde, 2020).

Things that can be improved are learning designs that can use student worksheets (LKPD) as a learning bridge because student worksheet have a positive role in helping students construct concepts and supporting students to achieve the expected competencies (Ranti & Usmeldi, 2019), especially students at the school level. Basics still require pictures or contextual instructions because they are still in the concrete operational stage (Fitria et al., 2021; Saiful et al., 2019). Pictures and instructions that guide students to achieve the desired concept can be included in the student worksheet. This research was conducted in order to transfer abilities to teachers to design learning with student worksheet which integrates the RADEC learning model (Read, Answer, Discuss, Explain, and Create).

RESEARCH METHODS

The research model used in this research is Educational Design Research (EDR) because in the research an intervention will be carried out in the form of a workshop on preparing RADEC-based learning designs at Elementary Lab School UPI Purwakarta and in several previous studies EDR was also carried out through interventions such as professional development activities in the form of workshop (Cumbo & Selwyn, 2022). The workshop itself is also part of the research methodology as explained by Ørngreen and Levinsen (2017).

Like the almost similar development of professionalism that was carried out by Connolly et al. (2021), in terms of increasing student numeracy, a research team FGD was carried out with teachers at the Elementary Lab School UPI Purwakarta to determine and prepare RADEC-based student worksheet which was able to give rise to CLN students, then after the CLN-oriented RADEC-based student worksheet prototype is formed, expert validation is carried out by education experts, RADEC experts, learning experts, literacy experts, numeracy experts and character experts. This research will be designed into five stages, namely stage (1) Identification and analysis of field needs, (2) preparation/development planning, (3) validation stage.

At the workshop stage itself, numeracy indicators were explained in detail and thoroughly with guidance from the Guide to Strengthening Literacy and Numeracy in Schools published by Directorate General of PAUD, DIKDAS and DIKMEN of the Ministry of Education, Culture, Research and Technology of the Republic of Indonesia (2021). The components are explained in Figure 1. Numeracy itself basically has a broader scope than mathematics learning. In other words, learning mathematics certainly has implications for numeracy, but numeracy itself is a student's ability to process things related to critical, mathematical and systematic thinking skills which includes many things outside mathematics. Thus, numeracy practices can be seen in other study subjects as exemplified by Figure 2. Many of the pedagogies commonly implemented or recommended in programs designed to support increased numeracy competency potentially reflect one type of cultural and social understanding of numeracy, while ignoring many others, unless teachers are able to design pedagogies that reflect social aspects. and the cultural knowledge that students bring to their classrooms. Developing pedagogy that facilitates shared mathematical meaning is critical to meeting students' diverse mathematics and numeracy needs. Without this, many students will not develop skills strong enough to accommodate further learning and will be disadvantaged in wider social and societal settings.

Content	Number	Representation Sequence and Property Operation
	Geometry and Measurement	Geometry Shape Measurement
	Algebra	Linear Equality and Inequality Relation and Function Sequence and Property
	Data and Uncertainty	Data and Representation Uncertainty and Opportunity
Cognitive Process	Understanding	Remembering Identification Classification Counting Absorbing Measuring
		Choosing Model-making Doing
		Analyzing Representating Evaluating Concluding Justifying
	Applying	
	Reasoning	
Context	Personal	
	Socio-cultural	
	Scientific	

Figure 1. Numeracy development guide
 (Adapted from Geiger et al., 2014)

IPA	Estimate the growth expression prediction of organisms by drawing charts
IPS	Draw a chart of personal water consumption and compare it with the water supply situation in different regions of Indonesia
Language	Comparison of mathematical terms with different meanings from those used in daily life
History	Compare the food supply during II World War with the food consumption of learners by histogram
Art	Estimate the required rooms to be drawn to an appropriate scale
Physical Education	Estimate the heat burned by specific sports activities
PKn	Compare the economic growth rate of Indonesian president in different times

Figure 2. Examples of numeracy in other subjects

RESULTS AND DISCUSSION

Results

After obtaining interview data from the principal of Elementary Lab School UPI Purwakarta, it was discovered that teachers still experienced difficulties in teaching character, literacy and numeracy to students in the learning process. Preparations for FGDs and a CLN-oriented RADEC learning model workshop were carried out because from the research findings of Sopandi et al. (2018) the RADEC learning model was proven to develop collaborative character and creative thinking which is the substance of the character as well as critical thinking and problem solving skills which are the focus indicators of Numeracy, in addition to the RADEC learning model, is also very easy to understand, plus findings from other research on the RADEC learning model on elementary school students' mathematical thinking abilities state that RADEC can accommodate all styles.learning in achieving increased learning achievement (Nugraha & Prabawanto, 2021).

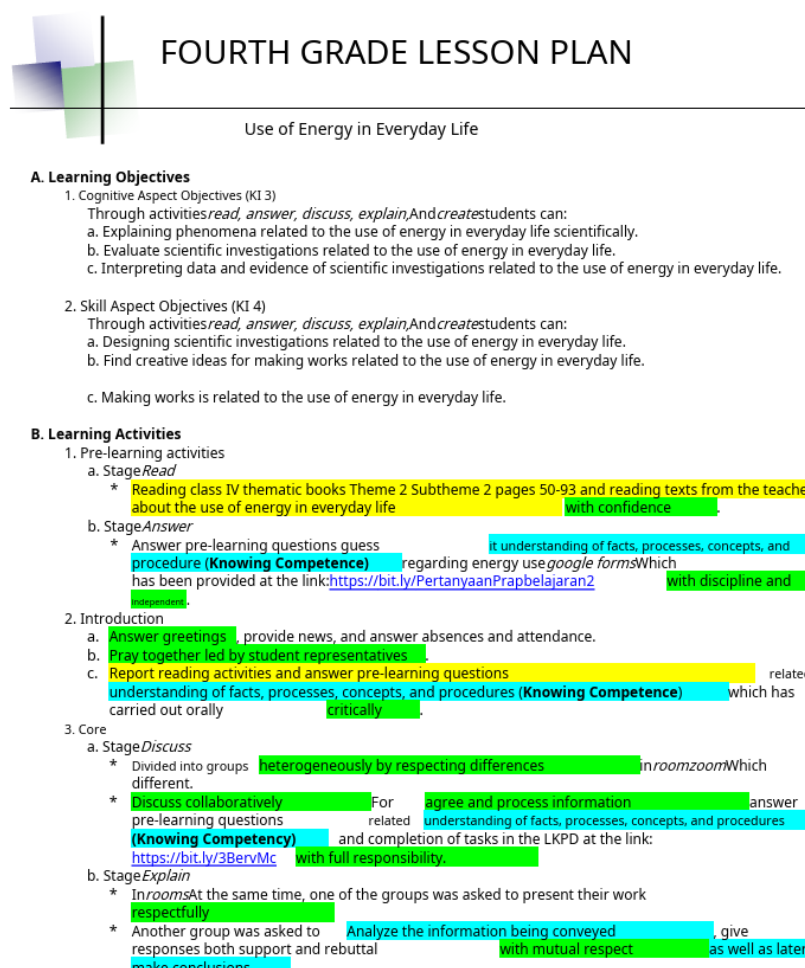


Figure 3. Example of numeracy profile in a lesson plan

In relation to character and literacy, teachers have been able to create learning designs that bring out indicators of character and literacy. However, in relation to numeracy, teachers' understanding of numeracy competency is still not comprehensive. This is reflected in the numeracy components in terms of cognitive processes which include understanding, application and reasoning, which can actually be seen appearing in the learning designs designed by teachers at Labschool Purwakarta Elementary School, but from the first two teachers who gave presentations on the learning designs. have made them feel that their learning design has not brought out a numeracy profile. An example of the appearance of a numeracy profile is shown in Figure 3.

Table 1. Post-workshop analysis of teacher lesson plan

Grades/ Subjects	Subjects	Cognitive Level Profile When It Comes to Numeracy	Specific Indicators	Instructional Process
Grade 1	Indonesian Language	Understanding	Identification	Students have a guided discussion to agree on alternative answers to pre-learning questions about a story they have read
		Reasoning	Analyzing	Reflect and listen to friends' explanations with mutual respect.
Grade 2	Indonesian Language	Understanding	Identification	Discuss collaboratively to agree on ideas and process information on answers to pre-learning questions and completion of tasks in the student worksheet related to

Grades/ Subjects	Subjects	Cognitive Level Profile When It Comes to Numeracy	Specific Indicators	Instructional Process
Grade 3	Thematic	Reasoning	Evaluating and Justifying	maintaining personal and environmental cleanliness. Other groups were asked to provide responses, both support and rebuttal, with mutual respect.
		Understanding	Identification	Students discuss collaboratively to agree and process information on answers to pre-learning questions related to understanding facts and concepts as well as completing assignments that have been provided by the teacher with full responsibility.
Grade 4	Science and Social	Reasoning	Evaluating, Justifying, and Concluding	Other groups are asked to analyze the information being presented, provide responses in the form of support or rebuttal with mutual respect and then draw conclusions.
		Applying	Doing	Discuss collaboratively to agree and process information on answers to pre-learning questions related to understanding facts, processes, concepts and procedures
Grade 5	Civic Education	Reasoning	Evaluating and Justifying	Teachers and students discuss the results of information obtained by students through reading activities and answer orally critically
		Understanding	Identification	Teachers and students discuss the results of information obtained by students through reading activities and answer orally critically
Grade 6	Thematic	Reasoning	Evaluating and Justifying	Other groups (not presenting) provide responses, either in the form of support or responses with mutual respect
		Understanding	Identification	Students discuss collaboratively to agree and process information on answers to pre-learning questions related to understanding facts and concepts as well as completing assignments that have been provided by the teacher with full responsibility.
All Grades	Arts	Reasoning	Evaluating, Justifying, and Concluding	Other groups are asked to analyze the information being presented, provide responses in the form of support or rebuttal with mutual respect and then draw conclusions.
		Understanding	Identification	After reading, students are asked to group up and write down what is meant by Three-Dimensional Art and Sculpture.
		Reasoning	Representing	One group was asked to present the results of a summary of the elements

Grades/ Subjects	Subjects	Cognitive Level Profile When It Comes to Numeracy	Specific Indicators	Instructional Process
All Grades	P.E	Understanding	Identification	of fine art, three-dimensional fine art. The teacher explains again about the elements of fine art, three-dimensional fine art, and sculpture. Reflect and listen to the teacher's explanation.
		Reasoning	Evaluating, Justifying, and Concluding	Students discuss collaboratively to agree on information about the differences between running and jumping in the student worksheet prepared by the teacher. Another group is tasked with analyzing the information submitted and responding with mutual respect and drawing conclusions together.
All Grades	Religion	Understanding	Identification	Students discuss collaboratively to agree on ideas or equate ideas and process information on answers to pre-learning questions that have been given previously
		Reasoning	Evaluating and Justifying	One group is asked to present the results of their discussion with full respect, the other group is asked to provide responses both support and rebuttal with mutual respect.
All Grades	Sundanese	Understanding	Identification	Students discuss collaboratively to agree on ideas or equate ideas and process information on answers to pre-learning questions that have been given previously
		Reasoning	Evaluating and Justifying	One of the groups presented the results of their discussion regarding responses to several terms from the "Healthy Kadaharan" text that had been read. Another group was asked to rewrite the story of "healthy nutrition" using their own language.
All Grades	ICT	Understanding	Identification	Students discuss collaboratively and operate word processing software (Microsoft Word) to agree and process information on answers to pre-learning questions related to the function of word processing icons (Word Processing).
		Reasoning	Evaluating and Justifying	One of the students was asked to present the results of their work on determining hardware and software with full respect. Other students are asked to analyze the information presented, provide responses both supporting and rebutting with mutual respect and making conclusions

Discussion

Table 1 above illustrates lesson plan the teachers made after participating in teacher professional development of RADEC Learning Model integration with CLN orientation. Surprisingly the teachers were able to integrate numeracy indicators in the lesson plan unlike the findings of Getenet (2022) that teachers who focus on non-mathematics curriculum topics, such as art or history, are unlikely to feel prepared to develop mathematical ideas geared toward numeracy. Raising teachers' awareness and importance of numeracy, as well as encouraging their engagement with numeracy components outside of mathematics curriculum areas, is a difficulty. Integration of habituation of numeracy in all subjects can result in better impact on educational practice (Niklas & Schneider, 2014; Seitz & Weinert, 2021; Sumarno et al., 2022).

Since the initial RADEC strategy is Read and Answer which are pre-learning activities at home (Nurhayati et al., 2022; Sopandi et al., 2022), this requires parental involvement. In line with this, the role of parents is extremely important in their children's early literacy and numeracy instruction where the child is still in the formative period (Singh et al., 2023). Purnomo et al. (2022) discovered that teachers and students in the new assessment system did not have any experience interacting with questions on numeracy skills. Hence, this has something to do with pre-learning questions that are prerequisite in the RADEC learning model to help accommodate this.

The teachers mostly encourage the students to identify the problem which is supported by Kurniasih et al. (2019) that problem posing is recommended in numeracy ability improvement. Low-performing children also need help to enumerate and thus solve problems requiring counting; this has direct pedagogical implications where RADEC can provide an alternative (Aunio, 2015).

Students must also be creative in order to design a strategy that will allow them to enjoy their trip to the fullest (Machromah et al., 2021). In addition, *Merdeka* Curriculum also regulates *Penguatan Profil Pelajar Pancasila* Project that requires creativity among students while RADEC learning model also promotes ideas of creativity among students (Lestari et al., 2022).

An interesting finding was that from several teachers who made presentations, each Class 2 teacher, ICT teacher, and Class 6 teacher said that they each felt that the lesson plans they had made did not show the profile of numeracy emergence. This is an interesting finding from RADEC-based professional development and requires continuity for teachers' understanding because the core purpose of numeracy practice is to provide individuals with the ability to analyze, judge, and make judgments about their alternatives and possibilities in the real world despite when teachers have a strong understanding of the concept of numeracy and are aware of the critical role it plays in allowing an individual to fully interact in society, the inclusion of numeracy within their discipline topic becomes more relevant (Bennison, 2015; Fanshawe et al., 2021; Geiger et al., 2014).

Overall, all teachers are able to select appropriate spoken, written, or visual texts or resources based on their individual students' needs and interests. As a result, they can make the necessary changes to the syllabus's contents; choose the best methods, approaches, and techniques to use; plan the most appropriate activities to carry out; and select, design, or adapt the teaching materials that are best suited for their students in different settings and with varying numeracy or literacy proficiency levels which answers the challenge of previous study of Md-Ali et al. (2016) regarding numeracy learning which is effective even in this study also includes character.

CONCLUSION

This study shows that in relation to character and literacy, teachers have been able to create learning designs that bring out indicators of character and literacy. However, in relation to numeracy, teachers' understanding of numeracy competency is still not comprehensive. The teachers were able to integrate numeracy indicators in the lesson plan. Through the discussion, it is justified that RADEC learning model also promotes ideas of creativity among students in terms of numeracy-oriented learning. All teachers are now able to select appropriate spoken, written, or visual texts or resources based on their individual students' needs and interests. As a result,

they can make the necessary changes to the syllabus's contents; choose the best methods, approaches, and techniques to use; plan the most appropriate activities to carry out; and select, design, or adapt the teaching materials that are best suited for their students in different settings and with varying numeracy or literacy proficiency levels

REFERENCES

- Aunio, P., Heiskari, P., Van Luit, J. E., & Vuorio, J. M. (2015). The development of early numeracy skills in kindergarten in low-, average-and high-performance groups. *Journal of Early Childhood Research*, 13(1), 3-16. <https://doi.org/10.1177/1476718X145387>
- Bennison, A. (2015). Supporting teachers to embed numeracy across the curriculum: A sociocultural approach. *ZDM Mathematics Education*, 47(4), 561-573. <https://doi.org/10.1007/s11858-015-0706-3>
- Chudasama, M. (2021). Building bridges for teachers as researchers. *Management in Education*, 35(1), 66-68. <https://doi.org/10.1177/0892020620963119>
- Connolly, C., Carr, E., & Knox, S. (2023). Diving deep into numeracy, cross-curricular professional development. *International Journal of Mathematical Education in Science and Technology*, 54(6), 1034-1053. <https://doi.org/10.1080/0020739X.2021.1986160>
- Cumbo, B., & Selwyn, N. (2022). Using participatory design approaches in educational research. *International Journal of Research & Method in Education*, 45(1), 60-72. <https://doi.org/10.1080/1743727X.2021.1902981>
- Directorate General of PAUD, DIKDAS and DIKMEN of the Ministry of Education, Culture, Research and Technology of the Republic of Indonesia. (2021). *Panduan penguatan literasi dan numerasi di sekolah*. Kementerian Pendidikan dan Kebudayaan.
- Fanshawe, M., Saltmarsh, S., & Larsen, E. (2023). Learning and exploring teacher identity: Preparing for teaching in the Partners in Literacy and Numeracy (PLaN) programme. *Asia Pacific Journal of Education*, 43(1), 1-15. <https://doi.org/10.1080/02188791.2020.1866492>
- Fitria, Y., Kiswanto Kenedi, A., & Syukur, S. K. (2021). The effect of scientific approach on elementary school students' learning outcomes in science learning. *JPsD (Jurnal Pendidikan Sekolah Dasar)*, 7(1), 78-90. <https://doi.org/10.30870/jpsd.v7i1.10353>
- Geiger, V., Goos, M., & Dole, S. (2014). Curriculum intent, teacher professional development and student learning in numeracy. In Y. Li & G. Lappan (Eds.), *Mathematics curriculum in school education* (pp. 473-492). Springer. https://doi.org/10.1007/978-94-007-7560-2_22
- Getenet, S. T. (2022). Teachers' knowledge framework for designing numeracy rich tasks across non-mathematics curriculum areas. *International Journal of Education in Mathematics, Science and Technology*, 10(3), 663-680. <https://doi.org/10.46328/ijemst.2137>
- Guerrero-Hernández, G. R., & Fernández-Ugalde, R. A. (2020). Teachers as researchers: Reflecting on the challenges of research-practice partnerships between school and university in Chile. *London Review of Education*, 18(3), 423-438. <https://doi.org/10.14324/LRE.18.3.07>
- Hapsari, T. (2019). Literasi matematis siswa. *Jurnal Euclid*, 6(1), 84-94. <https://doi.org/10.33603/e.v6i1.1885>
- Hidayah, I. R., Kusmayadi, T. A., & Fitriana, L. (2021). Minimum competency assessment (Akm): An effort to photograph numeracy. *Journal of Mathematics and Mathematics Education*, 11(1), 14-20. <https://doi.org/10.20961/jmme.v11i1.52742>
- Kolar, V. M., & Hodnik, T. (2021). Mathematical literacy from the perspective of solving contextual problems. *European Journal of Educational Research*, 10(1), 467-483. <https://doi.org/10.12973/EU-JER.10.1.467>
- Kurniasih, A. W., Hidayah, I., & Asikin, M. (2019). The stimulus for facilitating junior high school student's thinking in mathematics. *Journal of Physics: Conference Series*, 1321(2). <https://doi.org/10.1088/1742-6596/1321/2/022106>
- Lestari, H., Ali, M., Sopandi, W., & Wulan, A. R. (2022). The ESD-oriented RADEC model: To improve students sustainability consciousness in elementary schools. *Pegem Journal of Education and Instruction*, 12(2), 113-122. <https://doi.org/10.47750/pegegog.12.02.11>

- Machromah, I. U., Utami, N. S., RiniSetyaningsih, D. M., & Fatmawati, L. W. S. (2021). Minimum competency assessment: Designing tasks to support students' numeracy. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, 12(14), 3268-3277. <https://doi.org/10.1088/1742-6596/1321/2/022106>
- Md-Ali, R., Karim, H. B. B. A., & Yusof, F. M. (2016). Experienced primary school teachers' thoughts on effective teachers of literacy and numeracy. *Malaysian Journal of Learning and Instruction*, 13(1), 43-62.
- Niklas, F., & Schneider, W. (2014). Casting the die before the die is cast: The importance of the home numeracy environment for preschool children. *European Journal of Psychology of Education*, 29, 327-345. <https://doi.org/10.1007/s10212-013-0201-6>
- Nugraha, T., & Prabawanto, S. (2021). The enhancement of students' mathematical conceptual understanding through RADEC learning model. *Eduma: Mathematics Education Learning and Teaching*, 10(2), 167-177. <https://doi.org/10.24235/eduma.v10i2.9073>
- Nurhayati, Y. E. T. I., Sopandi, W. A. H. Y. U., Sumirat, F. A. N. N. Y., Kusumastuti, F. A., Sukardi, R. R., Saud, U. S., & Sujana, A. T. E. P. (2022). Pre-learning questions of energy sources on radec learning model: Validation and development. *Journal of Engineering Science and Technology*, 17(2), 1028-1035.
- Ørngreen, R., & Levinsen, K. (2017). Workshops as a research methodology. *Electronic Journal of e-Learning*, 15(1), 70-81.
- Purnomo, H., Sa'dijah, C., Hidayanto, E., Permadi, H., & Anwar, L. (2022). Development of instrument numeracy skills test of Minimum Competency Assessment (MCA) in Indonesia. *International Journal of Instruction*, 15(3), 635-648. <https://doi.org/10.29333/iji.2022.15335a>
- Ranti, S., & Usmeldi. (2019). Development of integrated science student's worksheet (LKPD) based on research-based learning integrated with religion value. *Journal of Physics: Conference Series*, 1185(1). <https://doi.org/10.1088/1742-6596/1185/1/012143>
- Saiful, A., M., Ahmadi, F., Suminar, T., & Mirza, A. S. (2019). Development of realistic mathematics education mobile learning in elementary school article info. *Journal of Primary Education*, 8(2), 169-175. <https://doi.org/10.15294/jpe.v8i2.25880>
- Seitz, M., & Weinert, S. (2022). Numeracy skills in young children as predictors of mathematical competence. *British Journal of Developmental Psychology*, 40(2), 224-241. <https://doi.org/10.1111/bjdp.12408>
- Singh, D., Chand, S. P., Kumar, K. K., & Ali, R. (2023). Effectiveness of literacy and numeracy in commerce subjects among secondary schools in Fiji. *Journal of Education and Learning (EduLearn)*, 17(3), 447-454. <https://doi.org/10.11591/edulearn.v17i3.20873>
- Sopandi, W., Pratama, Y., & Handayani, H. (2018). Profil perubahan kompetensi pedagogik guru pendidikan dasar dan menengah melalui sosialisasi dan workshop Read-Answer-Discuss-Explain-And Create (RADEC). *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 8(1).
- Sopandi, W., Sa'ud, U. S., Sujana, A., Sukardi, R. R., Suhendra, I., Yanuar, Y., Sutinah, C., & Sumirat, F. (2022). Pelatihan dan asistensi model pembelajaran RADEC untuk guru sekolah dasar di wilayah Priangan Timur Jawa Barat. *Pedagogia: Jurnal Ilmiah Pendidikan*, 14(2), 45-49. <https://doi.org/10.55215/pedagogia.v14i2.6453>
- Sumarno, W. K., Shodikin, A., Solikha, N. I. A., Pratama, N. K., & Valensiana, B. F. (2022). Integrative teaching material with project-based learning approach to improve elementary school students' bilingual literacy and numeracy skills. *International Journal of Elementary Education*, 6(4). <https://doi.org/10.23887/ijee.v6i4.52392>

Author(s):

*Indra Gunawan (Corresponding Author)
Elementary Education Study Program, School of Postgraduate Studies,
Universitas Pendidikan Indonesia,
Jl. Dr. Setiabudi No. 229, Isola, Kec. Sukasari, Bandung City, West Java 40154, Indonesia
Email: indragunawan@upi.edu

Wahyu Sopandi
Elementary Education Study Program, School of Postgraduate Studies,
Universitas Pendidikan Indonesia,
Jl. Dr. Setiabudi No. 229, Isola, Kec. Sukasari, Bandung City, West Java 40154, Indonesia
Email: wsopandi@upi.edu

Hany Handayani
Elementary Education Study Program, School of Postgraduate Studies,
Universitas Pendidikan Indonesia,
Jl. Dr. Setiabudi No. 229, Isola, Kec. Sukasari, Bandung City, West Java 40154, Indonesia;
Elementary Teacher Education Study Program, STKIP PGRI Purwakarta
Jl. Laks. RE Sea. Martadinata No. 43, Central Nagri, District. Purwakarta, Purwakarta Regency, West Java 41114,
Indonesia
Email: hanyhandayani@upi.edu

Nurul Fatonah
Elementary Education Study Program, School of Postgraduate Studies,
Universitas Pendidikan Indonesia,
Jl. Dr. Setiabudi No. 229, Isola, Kec. Sukasari, Bandung City, West Java 40154, Indonesia
Email: nurulfatonah@upi.ac.id

Indra Suhendra
Elementary Education Study Program, School of Postgraduate Studies,
Universitas Pendidikan Indonesia,
Jl. Dr. Setiabudi No. 229, Isola, Kec. Sukasari, Bandung City, West Java 40154
Email: isuhendra@upi.edu

Yusup Maulana
Elementary Education Study Program, School of Postgraduate Studies,
Universitas Pendidikan Indonesia,
Jl. Dr. Setiabudi No. 229, Isola, Kec. Sukasari, Bandung City, West Java 40154
Email: ymaulana@upi.edu
