JPPIPA 10(12) (2024)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Development of an Integrated Teaching Module for TaRL Approach Based on Differentiated Learning

Yantoro[1*], Muhammad Sholeh[1], Hendra Budiono[1], Eka Sastrawati[1]

[1] FKIP, Jambi University, Jambi, Indonesia.

Received: May 26, 2024
Revised: September 15, 2024
Accepted: December 25, 2024
Published: December 31, 2024

Corresponding Author:
Yantoro
comyantoro@unja.ac.id

DOI: 10.29303/jppipa.v10i12.9166

© 2024 The Authors. This open access article is distributed under a (CC-BY License)

Abstract: This research focuses on the issue of students failing to achieve learning goals due to not learning at their ability level. Educators must have pedagogical competence, including the ability to develop good and creative learning tools to create an active and interesting learning atmosphere. The TaRL approach, developed in elementary schools using differentiated learning, The TaRL approach is designed in line with student achievement, abilities, and needs. Developing a differentiation-based TaRL approach will create an active learning atmosphere and provide learning opportunities according to student needs. Educators must realize that each student is unique and has different qualities from birth. Of course, we need to fulfill their educational needs as best as possible to adapt education to student's needs and skill levels, ensuring they meet the required learning outcomes. The research uses mixed methods, including research and development, validity, and practicality. Data was collected through practice angle and validity instruments, with quantitative and qualitative data used to assess the effectiveness of TaRL modules. The high validity category of product validation showed a high validation rate of 92%, with 96% media validity, 97.16% material validation, and 89.43% language validation. The study also included teachers' and students' opinions on the differentiation-based efficacy of TaRL modules.

Keywords: Differentiated; Integrated; TaRL; Teaching Module

Introduction

Education is a plan to realize and improve individual abilities which include intelligence, character, and other positive abilities (Gunawardena et al., 2024). The definition of learning is that it focuses on interactions between teachers and students, the learning approach involves the teacher's role in providing direction and providing opportunities for students to get a learning atmosphere that is in line with predetermined pedagogical goals. Teachers as facilitators should be able to provide and create active learning, develop interest in learning, and increase students' knowledge (Faradila et al., 2023). Policymakers emphasize that all students must be supported to develop their knowledge and skills at their level (Rock et al., 2008) and the desire to increase equity or equality among students (Parker et al., 2022). Educators must therefore have pedagogical competence, including the ability to develop effective and creative learning tools to create an active and interesting learning atmosphere.

A serious challenge facing the world of education in Indonesia in the global complexity is teacher competence in designing and developing teaching tools such as modules that meet students' needs and abilities, and also teachers do not yet have the skills to develop and integrate them. learning approaches with innovative learning methods to create interactive learning, for example developing a differentiation-based TaRL approach (Rosnaeni, 2021; Cindyana et al., 2022). The TaRL approach is designed in line with student achievement, abilities, and needs. By developing a

How to Cite:
Yantoro, Sholeh, M., Budiono, H., & Sastrawati, E. (2024). Development of an Integrated Teaching Module for TaRL Approach Based on Differentiated Learning. *Jurnal Penelitian Pendidikan IPA*, *10*(12), 10178–10187. https://doi.org/10.29303/jppipa.v10i12.9166

differentiation-based TaRL approach, an active learning atmosphere will be created and provide learning opportunities according to student needs. Educators must realize that each student is unique and has different qualities from birth. Of course, we need to fulfill their educational needs as best as possible. Additionally, challenges are often well received by the human brain, but only if they provide an ideal level of difficulty (Lodge et al., 2018; Darling-Hammond et al., 2020). If students work on questions that are too simple, they will easily get bored and their minds will become less developed. On the other hand, students may become disinterested and unmotivated in learning if the problems they are working on are too challenging. A good question is challenging but not too challenging, just slightly above the student's proficiency level.

The Indonesian government through the Ministry of Education, Culture, and Research has designed an independent curriculum. The independent curriculum provides flexibility for teachers to teach according to their students' capacities, which is commonly known as Teaching at Right Level (TaRL) (Major et al., 2021). Through this approach, teachers are expected to carry out learning centered on students' learning readiness, not at class level. This learning aims to implement Ki Hadjar Dewantara's teaching philosophy which is student-centered, strengthening students' numeracy and literacy competencies, so that each student can achieve the expected learning goals. TaRL is closely related to student interests and learning outcomes. Implementing TaRL requires teachers to identify student interests and learning outcomes through diagnostic assessments. The results of this assessment will be used by the teacher as a reference in planning learning according to the characteristics of the students.

To increase student interest and learning outcomes, TaRL allows teachers to adapt their learning in such a way that it inspires, motivates, and enriches the learning experience, so that students become more active and involved in learning, and can increase their interest and learning outcome. When implementing learning according to the characteristics of students, this does not mean that teachers have to arrange several teaching modules to accommodate different learning needs, teachers only need to arrange one teaching module with learning activities that are equipped with instructions for adapting to achievement stages and characteristics. learners (Susanti et al., 2023). Applying the TaRL approach, teachers need to adapt learning to the characteristics of students. TaRL emphasizes teachers provide different treatment to students so that their learning abilities and interests can develop according to their respective levels of development. These adjustments can be made by adjusting aspects such as the scope or content of learning materials, learning processes, learning outcomes products, and conditions of the learning environment. (Grassini, 2023; Tran-Duong, 2023). Currently, teachers are expected to be able to carry out learning under the curriculum applied, one of which is by using teaching modules (Wijngaards-de Meij & Merx, 2018). The teaching modules implemented by teachers should be teaching modules that can apply understanding to students according to their level of achievement student abilities.

Modules are teaching materials prepared for students' independent learning process (Mustadi et al., 2023). The use of this learning module is under the development of the 2013 curriculum, where the module can make the learning process more centered on student activity (student-centered) rather than teacher-centered (Angelina et al., 2024). Learning using modules allows a student who has a high learning speed to complete learning activities more quickly than other students (Istikomah, 2020). The module has several functions, including Independent teaching material. The use of modules in the learning process functions to improve students' ability to learn independently without relying on educators; Substitute for the function of educator (Nisa et al., 2022). Modules as teaching materials must be able to explain learning material well, clearly and easily understood by students; Evaluation tools. Modules are required to be able to measure and assess their level of knowledge of the material they have studied; Reference material for students. The module contains material that students must study (Prastowo, 2014).

This research develops an integrated module with a TaRL approach based on differentiated learning in an independent curriculum (Santoso, 2024). Teachers are expected to be able to innovate learning, create an interesting learning atmosphere, and design meaningful learning for students (Ovbiagbonhia et al., 2019). Therefore, the researcher raised the title Development of TaRL Integrated Teaching Modules Based on Differentiated Learning to assist teachers in developing teaching tools in the form of modules to help teachers develop teaching tools and help students improve their learning abilities according to the student's level of ability (Fauzia & Hadikusuma Ramadan, 2023). This research will produce a teaching tool product in the form of an integrated TaRL teaching module based on differentiation learning. The product development procedure goes through several stages:

Analysis Stage; Design stage; Development stage; Implementation stage; and Evaluation stage. From the above background, the problem formulation is obtained, namely to explore the level of teacher ability in developing teaching tools in the form of teaching

modules that are under the characteristics and needs as well as the level of learning competency, whether they support learning achievement and to determine the level of understanding and learning achievement of students in elementary schools by implementing differentiation-based TaRL module.

Method

The methods used in research include observation, research, and development. The implementation model used is called ADDIE which stands for Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model is an educational framework that presents a series of coherent educational procedures (Moses Adeleke Adeoye et al., 2024). This research and development take the form of a set of learning known as integrated teaching modules, a TaRL approach based on differentiated learning to improve students' understanding of mathematics in elementary schools. The ADDIE product development model is used because this model is direct and under the product development process that researchers will carry out. After all, each step in this process is carried out systematically and each step is evaluated to ensure that the product produced meets needs valid and appropriate.

The subjects of this research were students of SD IT Darun Najah Kerinci Regency and students of SDN 47/IV Jambi City. This exercise was carried out to measure mathematics proficiency metrics in the differentiation-based TaRL module to increase students' mathematics proficiency levels in basic education. A differentiation-based approach can increase student activity and increase their ability to solve problems that arise. By following the instructions, students are expected to be able to apply the modules studied. Data mining is a type of quantitative and qualitative research. Data from validators and the results of teacher and student responses to the implementation of learning modules are quantitative data. Qualitative data is data obtained from the opinions and observations of validators, instructors, and research participants which is used as input for making improvements.

The instruments of this research are student, teacher, and validator assessments. In this research, researchers used a type of analytical geometry. This instrument is used to test TaRL-based learning modules (validation and practice). Further data collection includes observational studies using TaRL-based open modulation. During testing. The analysis uses qualitative and quantitative data techniques. Qualitative data analysis was obtained from the direction of expert validators. Quantitative analysis is obtained from the final results of the questionnaire scores. The analysis techniques used in this research include qualitative and quantitative data analysis. Qualitative data analysis is based on the results of validator observations and analysis of media, material, and language. Quantitative data analysis was obtained from questionnaire scores. The results of the validation stage are then analyzed and their significance is recorded. The use of the validation formula is a modification. The results of the validation questionnaire from the validator are then analyzed and the percentage is calculated. Practicality criteria are shown in Table 1.

Table 1. The Validation Questionnaire from the Validator is then Analyzed and the Percentage is Calculated

Score (%)	Practicality Level
86 - 100	Good Practical (can be used without revision)
70 - 85	Practical sufficient (can be revised)
60 - 69	Less Practical (cannot be used)
0 - 59	Not too practical (total revision)

Result and Discussion

This research produces an integrated teaching module for the TaRL approach (*teach at the right level)* based on differentiated mathematics learning in schools. The implementation model used is called ADDIE which stands for Analysis, Design, Development, Implementation, and Evaluation. The analysis stage includes analyzing the needs for integrated learning modules using the TaRL approach in class IV elementary school. Observation results show that in the mathematics learning process in fourth-grade elementary school, teachers have not been able to create teaching modules that contain the TaRL approach model so students' abilities cannot be improved. The teaching modules used by teachers still rely on modules from internet sources. This situation shows the need for integrated teaching modules with the TaRL approach to improve elementary school mathematics abilities. This need is supported by the demands of an independent curriculum which requires teachers to be able to create and develop teaching modules according to students' learning needs.

Competencies related to the TaRL approach are packaged through integrated teaching modules so that they can be included in the content of mathematics subject teaching modules. If we analyze the characteristics of class IV students at SD IT Darun Najah Kerinci Regency and SDN 47/IV Jambi City, it can be seen that students like learning activities that are challenging and fun. This condition shows that learning in elementary schools is different from the learning process carried out at other levels of education. For

example, group discussion activities and solving mathematical problems to build curiosity which are hampered by limited means and facilities are challenges for a teacher. In the learning process, it is also seen that children prefer group (collaborative) learning compared to individual learning processes.

Students' curiosity can be seen from students' ability to ask questions and students' willingness to carry out activities under the work procedures given by the teacher. Observation results also show that students are familiar with the use of technology such as using computers and smartphones. From the characteristic analysis, the researcher determined the mathematics learning media used in the teaching module being developed. The design or planning stage is carried out by following the storyboard that was created previously. The content of the designed product refers to the analysis stage that has been obtained. The cover design and display of learning outcomes are presented in Figure 1.



Figure 1. Design module covers and module pages

The cover is designed to describe the contents of the teaching module being developed. The cover shows the title of the teaching module and pictures of students with different abilities and learning styles according to their levels, which reflects the learning process using the TaRL approach. Apart from being related to the TaRL approach, the cover is also designed with various images that can stimulate children's language development and listening skills. The use of media is categorized as unique and interesting by combining images and text in a creative form. In the teaching module, learning outcomes are displayed under the current curriculum, namely the Independent Learning Curriculum. These learning outcomes are competencies that students must achieve during the learning process. The display of each chapter and the teaching module display can be seen at Figure 2.



Figure 2. Display per module chapter and display module contents

The teaching modules developed also contain chapters for each subject or topic to be studied. From each chapter, teachers and students will know what

material students will learn and master during the learning process. The contents of the teaching module follow the rules in preparing teaching modules in the independent curriculum. This section starts from general information to a bibliography as a reference for the content of the teaching module. The product that has been obtained at the design stage is in the form of an initial prototype or initial product and then validated to produce a valid product. The validity of media, material, and language is part of the validation stage. The results of the validation process for each validator are displayed below Table 2.

Table 2. Level of Validation of TaRL Approach Integrated Teaching Module

Validation	Average Percentage Score (%)	Practicality Level
Media	96	High Validity
Material	97.16	High Validity
Language	89.43	High Validity
Validation Percentage	84.82	High Validity

Table 2 shows the level of validity of the product in the form of an Integrated Teaching Module with the TaRL approach to improve elementary school students' mathematical abilities that have been developed. The data shows that the average percentage of validity is in the range of 92% for the high validity category. The research results show that the product developed is suitable for use in the learning process, namely in the fourth-grade elementary school mathematics curriculum. Audits need to be carried out to determine media rankings. The validators selected are experts who are competent and understand their respective fields. In media, the average validation percentage is around 96% of the data. These results show that the product developed meets the criteria for using media, especially the TaRL approach in the learning process.

Furthermore, in material validation, the percentage of respondents who met the validity threshold was 97.16%. The language validation results show 89.43% with a high validity category. This means that the language in the teaching module being developed is under Indonesian spelling and is suitable for elementary school students (Tarjiah et al., 2023). Spelling is used as a tool for writing academic and research papers. However, using the internet efficiently will provide several benefits, such as the ability to communicate with other people more effectively. In addition, the use of a reliable and accurate e-reader is one of the key components of good Indonesian language skills.

The implementation stage is the stage of using the product in the actual classroom in the form of a trial. After the product is said to be valid, small-group and large-group trials are carried out. Small group trials were carried out to see the readability of the validated teaching module products. The results obtained are then refined so that the product is ready for use in large-group testing. In large group tests, the practicality of the product is seen by users, namely students and teachers, through a questionnaire given at the end of the lesson. The results of the level of practicality can be seen in Table 3.

Table 3. Feasibility Level of TaRL Approach Integrated Teaching Module at SD IT Darun Najah Kerinci Regency

Respondent	Average Percentage Score	Practicality Level
Teacher	91	Good Practical
Student	90.94	Good Practical
Averaging	90.97	Good Practical

Table 3 shows that the average percentage of product suitability scores at SD IT Darun Najah Kerinci Regency is 91% with the good practicality category. Based on the above requirements, teacher and student responses produced this text. Student responses had an average percentage of 90.94% in the good practice category, but teacher responses had an average percentage of 91% in the same category. Teaching modules that incorporate TRL techniques are based on instructions provided to improve students' mathematical abilities in elementary education. This strategy can be used for the teaching process, especially in fourth-grade elementary school mathematics subjects, this can be seen from the results of each stage of the assessment in the process. It is based on achieved practical experience and validation thresholds.

Table 4. Feasibility Level of TaRL Approach Integrated Teaching Module at SDN 47/IV Jambi City

Respondent	Average Percentage Score (%)	Practicality Level
Teacher	89	Good Practically
Student	88.60	Good Practically
Averaging	88.60	Good Practically

Table 4 shows that the average percentage value of product suitability at SDN 47/IV Jambi City is 89% with the good practicality category. Based on the above requirements, teacher and student responses produced this text. Student responses had an average percentage of 88.60% in the good practice category, but teacher responses had an average percentage of 89% in the same category. Teaching modules that incorporate TaRL techniques are based on instructions provided to improve students' mathematical abilities in elementary education (Yasa et al., 2023). This strategy can be used for the teaching process, especially in fourth-grade elementary school mathematics subjects, this can be seen

from the results of each stage of the assessment in the process. It is based on achieved practical experience and validation thresholds.

Based on this research, the implementation of the TaRL Approach teaching module based on differentiated learning has proven to be effective in assessing students' basic abilities in arithmetic, reading, and writing, thereby enabling customized learning based on low, medium, or high levels of student ability. achievement. Grouping students based on their abilities facilitates more personalized and effective teaching strategies, leading to increased student engagement and cognitive development. This research reveals that students enjoy the mathematics learning process more if they are grouped according to their abilities, resulting in higher levels of satisfaction and collaboration within the group. The TaRL approach fosters students' enthusiasm for learning by focusing on their specific skill level rather than their grade level or age (Muammar et al., 2023; Diniyarti & Agustika, 2023). These findings show that the TaRL approach can be a means for educators to increase student motivation and engagement, therefore the researchers raised this research to help teachers develop TaRL modules and improve differentiated learning (Puspitaningrum et al., 2024).

The analytical component of this research consists of determining needs based on the TaRL approach for teaching modules in grade IV elementary school. Observations show that in the Mathematics learning process in fourth-grade elementary school, instructors have not been able to create teaching modules for the Integrated TaRL Mathematics Approach, thus hampering the improvement of students' mathematical abilities. The training modules used are completely based on what is accessible on the Internet (Sung et al., 2016; Lawdis et al., 2017). This problem highlights the need for TaRL to approach teaching modules based on differentiated learning to improve elementary school student's mathematical abilities. The demand for an autonomous curriculum, which requires teachers to be able to build and develop learning modules based on students' learning needs, supports these needs (Afandi et al., 2024). Competencies related to the application of the TaRL approach through integrated teaching modules were investigated to be integrated into the content of Mathematics discipline teaching modules.

The TaRL approach has been proven effective in assessing students' basic abilities in numeracy, reading, and writing, allowing for tailored instruction based on students' low, medium, or high levels of achievement (Jazuli, 2022). Grouping students based on their abilities facilitates more personalized and effective teaching strategies, leading to increased student engagement and cognitive development. This research reveals that students enjoy the mathematics learning process more if they are grouped according to their abilities, resulting in higher levels of satisfaction and collaboration within the group. The TaRL approach fosters students' enthusiasm for learning by focusing on their specific skill level rather than their grade level or age. These findings show that the TaRL approach can be a means for educators to increase student motivation and engagement, therefore the researchers raised this research to help teachers develop TaRL modules and improve differentiated learning.

Under the characteristics of class IV, students enjoy demanding learning activities. For example, consider problem-solving activities and group discussions. This condition shows that learning in elementary school is different from learning at the next school level (Syahputra et al., 2022). For example, problem-solving exercises or group discussions to develop curiosity which is hampered by the Covid outbreak are difficult for a teacher to implement. In the learning process, it can be seen that the younger generation prefers to study in groups (collaborative) rather than alone. Students' capacity to ask questions and students' readiness to carry out tasks according to the work process given by the instructor shows students' curiosity (Amalia, 2018; Uden et al., 2022). Observation findings also reveal that students are familiar with the use of technology, such as laptops and mobile phones. Researchers identified the Mathematics learning materials used in the resulting training modules based on a study of these features. The design or planning stage is carried out by following the narrative board that has been created previously. The contents of the product design refer to the results of the analysis steps.

In media validation, the average data precision was around 96%. These results indicate that the product being developed reduces the experience of using media, especially in the educational sector. To understand the type of product validation required, the most common type of validation is media validation. Furthermore, in validating the respondents' material, the average validity score was 97.16%. These results also show that the material contained in the teaching module is under the demands of the curriculum and the characteristics of elementary school students (Faizal et al., 2023; Hayu Agustini et al., 2019). In line with the material validation that has been carried out, material suitability validation aims to determine the suitability of the content developed to student needs. In language validation, validation results were obtained at 89.43% with a high validity category. This means that the language in the teaching module being developed is under Indonesian spelling and is suitable for elementary school students (Sanjaya et al., 2022). Spelling is used as a writing tool

for academic writing such as essays and research papers. However, efficient use of the internet will produce certain benefits, such as the ability to communicate with other people more effectively. Additionally, a reliable and honest e-reader is an important component of competent Indonesian language skills.

The implementation stage is when the product is used in actual classes in the form of a trial. Small-group and large-group trials are carried out when the product is declared authentic. Small group testing is conducted to assess the readability of approved training module products. The results collected are then refined so that the product is ready for use in large-group testing. The usability of the product is evaluated by users, mainly students and teachers, in large group tests through questionnaires distributed at the end of the class. The evaluation stage carried out at each stage shows the results that the integrated teaching module of the TaRL approach to differentiated learning to improve elementary school students' mathematical abilities is suitable for use in the learning process, especially mathematics learning for fourth-grade elementary school. This is based on the level of validity and practicality that has been obtained. At the ADDIE development stage, evaluation is useful for improving the four stages that have been carried out previously.

In its implementation, changes to the curriculum or educational policies can influence the TaRL approach. Teachers may need to adjust their approach to comply with new regulations or adjust the curriculum. In practice, many elementary schools may not have adequate access to the technology and software needed to implement the TaRL approach effectively (Koch, 2017). Some teachers may not see the benefits of using technology in learning or may not be interested in developing a TaRL approach with students. This may hinder progress in implementing the TaRL approach (Angrist et al., 2022). Additionally, teachers in elementary schools may not have adequate training in using technology in teaching. They may feel insecure or lack the knowledge to properly integrate technology into learning. The use of technology in learning must be consistent with curriculum objectives and should not be considered an irrelevant addition. Elementary school students may have different levels of access to technology devices at home. This can create gaps in learning if some students have better access than others.

Teachers should have differentiation abilities, including developing learning tools in the form of teaching modules. These differentiated skills are part of the competencies that teachers possess and the competencies that differentiate teachers from other professions. In this context, teachers have a role as learning resources, managers, mentors, providers, and motivators of students in education (Sung et al., 2016). A serious challenge facing the world of education in Indonesia at this time of global complexity is the skill of developing an integrated teaching module development plan by combining the TaRL approach with differentiated learning to encourage collaborative and participatory learning in practice. Teachers can utilize technology to connect students with external resources, conduct collaborative projects, or improve student communication and cooperation.

TaRL helps students build the digital skills and literacy they need to thrive in an increasingly technological environment by incorporating technology into teaching. Technology allows teachers to provide timely and effective feedback to students, which can assist students in identifying areas of their education that need improvement. Because students are generally more engaged and motivated when technology is used successfully in the classroom, TaRL can increase student participation in learning. Additionally, TaRL can help teachers better manage their time and resources. Technology can be used to automate administrative tasks and provide access to online teaching materials. The effectiveness of the use of teaching modules during the learning process is very important for teachers and students.

Teachers will encounter obstacles and difficulties in maximizing teaching effectiveness if they are not accompanied by good teaching modules. This can result in the delivery of teaching material being irrelevant to what is required in the curriculum, therefore teaching modules are used as the main source used to improve the quality and quality of learning. The benefit of developing this TaRL Approach module is to add and improve the learning tools used as guidance for teachers during the learning process in the classroom in terms of learning resources. Under the current curriculum, namely the independent curriculum, teachers are given the freedom to develop their teaching modules in two ways, namely teachers can develop them by selecting and organizing existing teaching modules from the government and can develop them themselves according to the needs and characteristics of students and schools.

Conclusion

Based on the results of research regarding the development of integrated learning modules using the TaRL approach (teaching at the right level) based on mathematics differentiation learning in elementary schools. To increase elementary school students' understanding of Mathematics learning. The development of an integrated teaching module for the

TaRL (teaching at the right level) approach based on mathematics differentiation learning in elementary schools was carried out through three stages consisting of Analysis, Observation, Development, Application, and Assessment. The results of product validation, media validity, material validation with high validity, and language validation obtained the high validity category. The level of practicality obtained the good practicality category. With this research, it is hoped that the integrated TaRL (teaching at the right level) approach module based on differentiated learning can be used as a means to make it easier for students to understand the material, especially to make it easier for students to understand Mathematics material. Apart from that, teacher understanding and student performance regarding the integration of learning modules into the TaRL (Teaching at The Right Level) Mathematics Differentiation learning approach in Elementary Schools can be said to be effective and must be closely monitored to ensure the learning modules implemented can be used under the available materials or resources.

Acknowledgments
The contribution of the module using Canva software was stated as "very valid" by the first, second, and third expert validators. From the results of the response test on the e-module-based teaching material product using Canva, the development was stated as "very practical" by educators and students because it can be used anywhere.

Author Contributions
Conceptualization, Y.; methodology, M. S.; validation, H. B.; formal analysis, E. S.; investigation, Y.; resources, M. S.; data curation, H. B.: writing—original draft preparation, E. S.; writing—review and editing, Y.: visualization, M. S All authors have read and agreed to the published version of the manuscript.

Funding
This research received no external funding.

Conflicts of Interest
The authors declare no conflict of interest

References

Adeoye, M. A., Wirawan, K. A. S. I., Pradnyani, M. S. S., & Septiarini, N. I. (2024). Revolutionizing education: Unleashing the power of the ADDIE model for effective teaching and learning. *JPI (Jurnal Pendidikan Indonesia), 13*(1), 202-209. https://doi.org/10.23887/jpiundiksha.v13i1.68624

Afandi, R. A., Ningtyas, N. S., Susiyawati, E., & Pratiwi, P. (2024). The Effectiveness of Differentiated Learning Using the TaRL (Teaching at the Right Level) Approach for Improving Learning Interest and Learning Outcome. *Jurnal Pijar Mipa*, *19*(4), 657–662. https://doi.org/10.29303/jpm.v19i4.6860

Amalia, E. R. (2018). *Collaborative Learning: The Concepts and Practices in the Classroom*. https://doi.org/10.31219/osf.io/xn67t

Angelina, A., Bistari, B., & Halidjah, S. (2024). Development of Teaching Module for the Merdeka Curriculum with Nuances Critical Reasoning for Elementary School Students. *Jurnal Paedagogy*, *11*(3), 580. https://doi.org/10.33394/jp.v11i3.11815

Angrist, N., Bergman, P., & Matsheng, M. (2022). Experimental evidence on learning using low-tech when school is out. *Nature Human Behaviour*, *6*(7), 941–950. https://doi.org/10.1038/s41562-022-01381-z

Cindyana, E. A., Alim, J. A., & Noviana, E. (2022). Pengaruh Pembelajaran Berdiferensiasi Berbantuan Materi Ajar Geometri Berbasis Rme Terhadap Kemampuan Penalaran Matematis Siswa Kelas 3 Sekolah Dasar. *Jurnal Pajar (Pendidikan Dan Pengajaran)*, *6*(4), 1179. https://doi.org/10.33578/pjr.v6i4.8837

Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, *24*(2), 97–140. https://doi.org/10.1080/10888691.2018.1537791

Diniyarti, N. W., & Agustika, G. N. S. (2023). The Impact of the Teaching at the Right Level Approach on Critical Reasoning in Mathematics Learning in Elementary Schools. *Thinking Skills and Creativity Journal*, *6*(2), 152–159. https://doi.org/10.23887/tscj.v6i2.64619

Faizal, Khoirunnisa, & Budiono, H. (2023). Modules Based on Technological Pedagogical Content Knowledge to Improve Elementary Students' Science Domain. *International Journal of Elementary Education*, *7*(4), 616–625. https://doi.org/10.23887/ijee.v7i4.69193

Faradila, A., Priantari, I., & Qamariyah, F. (2023). Teaching at The Right Level sebagai Wujud Pemikiran Ki Hadjar Dewantara di Era Paradigma Baru Pendidikan. *Jurnal Pendidikan Non Formal*, *1*(1), 10. https://doi.org/10.47134/jpn.v1i1.101

Fauzia, R., & Hadikusuma Ramadan, Z. (2023). Implementasi Pembelajaran Berdiferensiasi Dalam Kurikulum Merdeka. *Jurnal Educatio FKIP UNMA*, *9*(3), 1608–1617. https://doi.org/10.31949/educatio.v9i3.5323

Grassini, S. (2023). Shaping the Future of Education: Exploring the Potential and Consequences of AI and ChatGPT in Educational Settings. *Education Sciences*, *13*(7), 692. https://doi.org/10.3390/educsci13070692

Gunawardena, M., Bishop, P., & Aviruppola, K. (2024). Personalized learning: The simple, the complicated, the complex and the chaotic. *Teaching and Teacher Education*, *139*, 104429. https://doi.org/10.1016/j.tate.2023.104429

Hayu Agustini, M., Suciarto Athanasius, S., & Bekti Retnawati, B. (2019). Identification of green marketing strategies: Perspective of a developing country. *Innovative Marketing*, *15*(4), 42–56. https://doi.org/10.21511/im.15(4).2019.04

Istikomah, E. (2020). Module Of Ict-Based Learning Mathematics: Response Of Students In The Learning Process. *Jurnal Pajar (Pendidikan Dan Pengajaran)*, *4*(3). https://doi.org/10.33578/pjr.v4i3.7992

Jazuli, L. (2022). Teaching At The Right Level (Tarl) Through The All Smart Children Approach (Sac) Improves Student's Literature Ability. *Progres Pendidikan*, *3*(3), 156–165. https://doi.org/10.29303/prospek.v3i3.269

Koch, K. (2017). Stay in the Box! Embedded Assistive Technology Improves Access for Students with Disabilities. *Education Sciences*, *7*(4), 82. https://doi.org/10.3390/educsci7040082

Lawdis, K., Baist, H., & Pittman, C. O. (2017). Use of online training modules for professional development with school-based therapists: Outcome project. *Journal of Occupational Therapy, Schools, & Early Intervention*, *10*(3), 300–314. https://doi.org/10.1080/19411243.2017.1335261

Lodge, J. M., Kennedy, G., Lockyer, L., Arguel, A., & Pachman, M. (2018). Understanding Difficulties and Resulting Confusion in Learning: An Integrative Review. *Frontiers in Education*, *3*, 49. https://doi.org/10.3389/feduc.2018.00049

Major, L., Francis, G. A., & Tsapali, M. (2021). The effectiveness of technology-supported personalized learning in low- and middle-income countries: A meta-analysis. *British Journal of Educational Technology*, *52*(5), 1935–1964. https://doi.org/10.1111/bjet.13116

Muammar, M., Ruqoiyyah, S., & Ningsih, N. S. (2023). Implementing the Teaching at the Right Level (TaRL) Approach to Improve Elementary Students' Initial Reading Skills. *Journal of Languages and Language Teaching*, *11*(4), 610. https://doi.org/10.33394/jollt.v11i4.8989

Mustadi, A., Wibowo, S. E., & Sayekti, O. M. (2023). The Development of E-Modules for Language Politeness Learning in Independent Curriculum-Based Elementary School. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *9*(2), 408. https://doi.org/10.33394/jk.v9i2.7366

Nisa, A. F., Rezkita, S., Cahyo Khosiyono, B. H., Wijayanti, A., Murniningsih, M., Utaminingsih, R., Trisniawati, T., & Sumiyati, S. (2022). 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*(2), 213–222. https://doi.org/10.23887/ijee.v6i2.44444

Ovbiagbonhia, A. R., Kollöffel, B., & Brok, P. D. (2019). Educating for innovation: Students' perceptions of the learning environment and their innovation competence. *Learning Environments Research*, *22*(3), 387–407. https://doi.org/10.1007/s10984-019-09280-3

Parker, R., Thomsen, B. S., & Berry, A. (2022). Learning Through Play at School – A Framework for Policy and Practice. *Frontiers in Education*, *7*, 751801. https://doi.org/10.3389/feduc.2022.751801

Prastowo, A. (2014). Pemenuhan Kebutuhan Psikologis Peserta Didik Sd/Mi Melalui Pembelajaran Tematik-Terpadu. *Jurnal JPSD (Jurnal Pendidikan Sekolah Dasar)*, *1*(1), 1. https://doi.org/10.26555/jpsd.v1i1.a538

Puspitaningrum, H. Z., Subekti, H., & Hasanah, U. N. (2024). Implementation of TaRL Approach by Utilizing Canva Media to Improve Students' Collaboration Skills and Learning Outcomes in Science. *IJORER : International Journal of Recent Educational Research*, *5*(4), 978–988. https://doi.org/10.46245/ijorer.v5i4.628

Rock, M. L., Gregg, M., Ellis, E., & Gable, R. A. (2008). REACH A Framework for Differentiating Classroom Instruction. *Preventing School Failure: Alternative Education for Children and Youth*, *52*(2), 31–47. https://doi.org/10.3200/PSFL.52.2.31-47

Rosnaeni, R. (2021). Karakteristik dan Asesmen Pembelajaran Abad 21. *Jurnal Basicedu*, *5*(5), 4341–4350. https://doi.org/10.31004/basicedu.v5i5.1548

Sanjaya, W., Erita, Y., Putri, R. S., & Indriyani, N. (2022). Teachers' Readiness and Ability in Designing Teaching Modules in the Independent Curriculum. *Journal Of Digital Learning And Distance Education*, *1*(7), 288–296. https://doi.org/10.56778/jdlde.v1i7.46

Santoso, E. Z. (2024). Enhancing Students' Independence of Learning: Problem-Based Learning Model Integrated with TaRL and CRT Strategies. *International Journal of Research in Mathematics*

Education, *2*(1), 71–78. https://doi.org/10.24090/ijrme.v2i1.11283

Sung, Y.-T., Chang, K.-E., & Liu, T.-C. (2016). The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. *Computers & Education*, *94*, 252–275. https://doi.org/10.1016/j.compedu.2015.11.008

Susanti, E., Mulyanti, R. Y., & Wati, L. N. (2023). Systematic Literature Review: Increasing Performance of Women MSMEs Through Competitive Advantage Based on Digital Transformation and Innovation. In *Proceedings of the International Conference on Global Innovation and Trends in Economics and Business (ICOBIS 2022)* (Vol. 230, pp. 25–61). Atlantis Press International BV. https://doi.org/10.2991/978-94-6463-068-8_4

Syahputra, A., Harahap, R. D., & Safitri, I. (2022). An Analysis of Student Learning Challenges in Elementary School Science Subject. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *8*(1), 237. https://doi.org/10.33394/jk.v8i1.4508

Tarjiah, I., Supena, A., Pujiastuti, S. I., & Mulyawati, Y. (2023). Increasing the reading ability of a student with dyslexia in elementary school: An explanatory case study by using family support, remedial teaching, and multisensory method. *Frontiers in Education*, *8*, 1022580. https://doi.org/10.3389/feduc.2023.1022580

Tran-Duong, Q. H. (2023). The effect of media literacy on effective learning outcomes in online learning. *Education and Information Technologies*, *28*(3), 3605–3624. https://doi.org/10.1007/s10639-022-11313-z

Uden, L., Sulaiman, F., & Lamun, R. F. (2022). Factors Influencing Students' Attitudes and Readiness towards Active Online Learning in Physics. *Education Sciences*, *12*(11), 746. https://doi.org/10.3390/educsci12110746

Wijngaards-de Meij, L., & Merx, S. (2018). Improving curriculum alignment and achieving learning goals by making the curriculum visible. *International Journal for Academic Development*, *23*(3), 219–231. https://doi.org/10.1080/1360144X.2018.1462187

Yasa, I. G. R. S., & Asril, N. M. (2023). Teacher Skills in Developing Project Based Learning (PjBL) Learning Tools in Elementary Schools. *MIMBAR PGSD Undiksha, 11*(3), 454–461. https://doi.org/10.23887/jjpgsd.v11i3.63921