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IMPROVING MULTIPLICATION SKILLS THROUGH NUMBER CARDS BASED ON DIFFERENTIATED CONTENT FOR CHILDREN WITH LEARNING DIFFICULTIES

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Abstract

Multiplication skills are one of the fundamental mathematical abilities that play an important role in supporting the mastery of advanced mathematical concepts. However, slow learners often experience difficulties in understanding multiplication concepts due to limitations in processing abstract information, memorizing numerical facts, and requiring longer learning time compared to their peers. This study aimed to improve multiplication computation skills through the implementation of number card media based on content-differentiated instruction for slow learners in Grade VII at SMP Negeri 2 Muara Ancalong. The study employed a Classroom Action Research (CAR) approach using the Kemmis and McTaggart model, which was conducted in two cycles consisting of planning, action implementation, observation, and reflection stages. The research participants were slow learners in Grade VII who experienced difficulties in understanding and solving multiplication problems. Data were collected through observation, mathematical ability tests, documentation, and field notes, and were analyzed using quantitative and qualitative descriptive approaches. The results showed a gradual improvement in students' multiplication computation skills from the pre-cycle stage to Cycle II. The use of number card media assisted students in understanding multiplication concepts through visual representations and manipulative learning activities, while content differentiation enabled teachers to adjust learning materials according to students' ability levels and individual learning needs. The findings indicate that the integration of concrete media and differentiated content instruction effectively improved calculation accuracy, conceptual understanding, and mathematics learning independence among slow learners. This study provides practical implications for developing more adaptive, concrete, and student-centered inclusive mathematics instruction that accommodates individual learning characteristics.

Keywords: number cards, differentiated instruction, multiplication computation skills, slow learners, inclusive mathematics education

Abstrak

Kemampuan operasi hitung perkalian merupakan salah satu keterampilan dasar matematika yang berperan penting dalam mendukung penguasaan konsep matematika lanjutan. Namun, siswa lambat belajar (slow learner) sering mengalami hambatan dalam memahami konsep perkalian karena keterbatasan dalam memproses informasi abstrak, mengingat fakta numerik, dan membutuhkan waktu belajar yang lebih panjang

dibandingkan siswa pada umumnya. Penelitian ini bertujuan untuk meningkatkan kemampuan operasi hitung perkalian melalui penerapan media kartu bilangan berbasis pembelajaran diferensiasi konten pada anak lambat belajar kelas VII SMP Negeri 2 Muara Ancalong. Penelitian menggunakan pendekatan Penelitian Tindakan Kelas (Classroom Action Research) dengan model Kemmis dan McTaggart yang dilaksanakan dalam dua siklus, meliputi tahap perencanaan, pelaksanaan tindakan, observasi, dan refleksi. Subjek penelitian adalah siswa lambat belajar kelas VII yang mengalami kesulitan dalam memahami dan menyelesaikan operasi perkalian. Data penelitian dikumpulkan melalui observasi, tes kemampuan berhitung, dokumentasi, dan catatan lapangan, kemudian dianalisis menggunakan pendekatan deskriptif kuantitatif dan kualitatif. Hasil penelitian menunjukkan adanya peningkatan kemampuan operasi hitung perkalian secara bertahap dari kondisi pra-siklus hingga Siklus II. Penggunaan media kartu bilangan membantu siswa memahami konsep perkalian melalui representasi visual dan aktivitas manipulatif, sedangkan pembelajaran diferensiasi konten memungkinkan penyesuaian materi berdasarkan tingkat kemampuan dan kebutuhan belajar siswa. Temuan penelitian menunjukkan bahwa integrasi media konkret dan strategi diferensiasi konten efektif meningkatkan ketepatan berhitung, pemahaman konsep, serta kemandirian belajar matematika pada anak lambat belajar. Penelitian ini memberikan implikasi bagi pengembangan pembelajaran matematika inklusif yang lebih adaptif, konkret, dan berpusat pada kebutuhan individual peserta didik.

Kata kunci: *kartu bilangan, pembelajaran diferensiasi, operasi hitung perkalian, anak lambat belajar, matematika inklusif*

INTRODUCTION

Mathematics is one of the fundamental areas of study in primary and secondary education because it plays an essential role in developing logical, analytical, systematic thinking, and problem-solving skills. One of the basic mathematical competencies that serves as a foundation for mastering more advanced mathematical concepts is computational ability, particularly multiplication. Multiplication is not only understood as repeated addition but also serves as a foundation for understanding more complex mathematical concepts, including division, fractions, measurement, ratios, algebra, and contextual problem solving in everyday life. Therefore, mastery of multiplication skills at the junior high school level is an important factor influencing students' continued success in mathematics learning (Bakar et al., 2021).

Basic numeracy skills develop through systematic instruction, repeated experiences, and the use of strategies appropriate to students' cognitive developmental characteristics. For most learners, multiplication concepts can be understood through a combination of mathematical symbols, routine practice, and teacher explanations. However, for students who experience learning difficulties, particularly students with a slow learning profile (*slow learners*), understanding multiplication concepts requires an approach that is more concrete, gradual, and responsive to individual needs. Being a slow learner does not mean that a student is incapable of understanding academic content; rather, such students require more time, different instructional methods, and additional learning support than students with typical academic development (Heward, 2022).

Students with a slow learning profile constitute a group of learners whose intellectual abilities are slightly below average but who do not meet the criteria for intellectual disability. They generally demonstrate lower academic performance than their peers, particularly in tasks

requiring abstraction, working memory, sustained attention, and rapid information processing (Chusna & Estu Harsiwi, 2024). In mathematics instruction, these characteristics may cause slow learners to experience difficulties recognizing numerical symbols, recalling multiplication facts, understanding problem-solving procedures, and applying mathematical concepts across different situations.

Difficulties experienced by slow learners in mathematics are not solely related to cognitive ability but are also influenced by their learning processes. Slow learners tend to require more time to receive and process information, more frequent repetition, and concrete examples before they can understand abstract concepts. Maliki (2016) explained that slow learners often experience limitations in short-term memory, meaning that previously learned information can be easily forgotten unless it is reinforced through repeated practice and learning experiences. Consequently, mathematics instruction that relies primarily on verbal explanations and abstract symbols may be less effective for this group of learners.

In the context of multiplication instruction, these challenges become apparent when students are required to memorize multiplication facts, perform calculations involving larger numbers, or solve problems requiring multiple procedural steps. Slow learners often make errors in determining the appropriate procedures, lose track of the sequence of steps, and require continuous teacher assistance. According to Hidayati et al. (2023), key characteristics of slow learners in academic settings include delayed conceptual understanding, slower task-completion rates, and a greater need for explicit instructional strategies than typically developing students. These challenges indicate that successful mathematics instruction for slow learners cannot be achieved simply by providing the same instructional content used with other students. A one-size-fits-all approach may widen existing learning gaps because students differ in readiness levels, conceptual understanding, and learning needs. Therefore, teachers need to implement instructional strategies that provide learning experiences aligned with individual student characteristics.

One relevant approach for addressing these needs is differentiated instruction. Differentiated instruction emphasizes the need for teachers to adjust the content, process, and product of learning according to students' readiness, interests, and learning profiles (Tomlinson, 2017). In this study, the focus is placed on content differentiation, namely adapting instructional materials according to students' ability levels through modifications in numerical complexity, the number of problems, the format of exercises, and the use of visual representations that are more accessible to slow learners. The implementation of content differentiation is important because slow learners require simpler instructional stages before reaching the expected level of competency. In multiplication instruction, for example, students should not immediately be presented with problems involving large numbers. Instead, instruction can begin with simple multiplication concepts using small numbers, repeated patterns, visual representations, and graduated practice activities. Such a gradual approach enables students to construct understanding progressively without experiencing excessive pressure resulting from differences in ability between themselves and their classmates.

In addition to instructional strategies, the use of concrete materials plays an important role in helping slow learners understand mathematical concepts. Cognitive development theory suggests that learners who experience difficulty understanding abstract concepts may learn

more effectively through direct experiences involving concrete objects or visual representations (Piaget, as cited in Hergenhahn & Olson, 2015). Therefore, instructional media such as number cards represent one potential alternative for bridging abstract mathematical concepts and more concrete learning experiences. The use of concrete instructional media is a relevant strategy for helping slow learners understand mathematical concepts, particularly multiplication. Because slow learners tend to experience difficulties understanding abstract symbols, mathematics instruction should be presented through learning experiences that are more concrete, visual, and manipulative. Concrete materials allow students to engage directly in learning by seeing, touching, manipulating, and connecting objects with the mathematical concepts being studied. This approach is consistent with principles of mathematics education that emphasize the importance of transitioning from concrete experiences to visual representations and ultimately to symbolic or abstract understanding (Bruner, 1966).

One concrete medium that can be used to improve multiplication skills is number cards. Number cards are instructional materials in card form containing numbers, operation symbols, or representations of particular mathematical concepts that can be used through games, grouping, matching, and computational practice. These materials offer several advantages because they are easy to use, flexible, adaptable to students' ability levels, and capable of creating a more engaging learning environment than instruction dominated by textbooks. Card-based learning activities also provide opportunities for students to repeatedly practice mathematical skills in an enjoyable manner, thereby reinforcing memory and conceptual understanding (Carbonneau et al., 2013).

In multiplication instruction, number cards can function as visual aids that help students understand the relationships among numbers, multiplication symbols, and calculated results. For example, students can use number cards to match pairs of numbers representing particular multiplication relationships, construct simple multiplication patterns, or complete graduated practice activities according to increasing levels of difficulty. For slow learners, manipulating these cards provides opportunities to develop understanding through concrete experiences before transitioning to more abstract problem solving. This approach is important because some students experience difficulties when they are expected to understand multiplication solely through memorization or mathematical symbols without visual support (Gersten et al., 2009).

In addition to improving conceptual understanding, the use of number cards can enhance students' engagement and motivation to learn. Mathematics is often perceived as difficult by students experiencing academic challenges because it involves numerous symbols, procedures, and rules that must be remembered. When instruction is presented through manipulative activities and educational games, students have opportunities to learn in a more active and enjoyable environment. According to Carbonneau et al. (2013), the use of concrete manipulatives in mathematics instruction has positive effects on conceptual understanding because students can connect physical experiences with mathematical representations.

However, the use of instructional media alone does not fully guarantee learning success among slow learners if it is not accompanied by appropriate instructional strategies. A common weakness in mathematics instruction is providing the same content and exercises to all students without considering individual differences in ability. This condition makes it difficult for

lower-performing students to follow instruction because the material is presented at a level of complexity that does not correspond to their readiness. Therefore, number cards need to be combined with an instructional approach capable of accommodating differences in students' abilities.

Differentiated instruction is one approach that can address these needs. Tomlinson (2017) explained that differentiated instruction enables teachers to adapt instruction based on students' readiness, interests, and learning profiles. Differentiation does not mean providing completely different instruction to every student; rather, it provides appropriate access to learning so that every learner has an opportunity to achieve the intended learning objectives. In this study, differentiation focuses on content, specifically the adaptation of multiplication materials according to students' ability levels. Content differentiation in multiplication instruction can be implemented through several forms of adjustment, including simplifying the numbers used, reducing problem complexity, providing visual examples, organizing practice activities from simple to more difficult tasks, and allowing more flexible learning time. For slow learners, these strategies enable them to understand concepts progressively without experiencing excessive cognitive load. This approach is consistent with the principles of Universal Design for Learning, which emphasize providing multiple means of accessing information and demonstrating understanding according to learners' needs (Meyer et al., 2014).

Previous studies have indicated that mathematics instruction based on concrete materials and differentiated approaches can improve numeracy skills among students with diverse learning needs. Gersten et al. (2009) explained that students with mathematics difficulties require explicit and systematic instruction, concrete representations, and sufficient opportunities for practice. Meanwhile, Tomlinson (2017) emphasized that instruction that considers students' learning readiness can improve engagement and academic achievement because students receive learning materials appropriate to their developmental levels.

Although various studies have examined the use of concrete materials in mathematics instruction and the implementation of differentiated instruction in heterogeneous classrooms, research specifically integrating number cards with content differentiation to improve multiplication skills among slow learners at the junior high school level remains limited. Most previous studies have focused on the use of manipulatives with elementary school children or on improving mathematical skills in general, whereas research on adaptive mathematics instructional strategies for slow learners at the junior high school level remains relatively scarce.

This research gap highlights the importance of developing an instructional strategy that not only employs concrete materials but also considers variations in students' academic abilities. This study offers novelty through the integration of three key components: number cards as visual-manipulative instructional tools, content differentiation as a strategy for adapting instructional materials, and a focus on improving multiplication skills among slow learners at the junior high school level. This combination provides a more comprehensive approach because the instructional media support conceptual representation, while content differentiation ensures that the level of difficulty is aligned with students' actual abilities.

The novelty of this study also lies in implementing number cards within the framework of Classroom Action Research (CAR), allowing the learning process to be improved reflectively through successive cycles of action. Unlike experimental research, which typically measures outcomes before and after an intervention, Classroom Action Research enables teachers to identify students' learning difficulties directly and adjust instructional strategies based on changes observed across cycles. This approach is consistent with the principles of action research, which aim to improve instructional practice through systematic processes of planning, action, observation, and reflection (Kemmis et al., 2014).

Based on initial observations conducted in Grade VII at SMP Negeri 2 Muara Ancalong, slow learners were found to experience difficulties understanding multiplication operations. Performance on multiplication exercises remained low, with most students failing to meet the established mastery criteria. Students experienced difficulties recalling multiplication facts, understanding relationships among numbers, and solving problems involving multiple procedural steps. These conditions were reinforced by instructional practices that continued to rely predominantly on textbooks and student worksheets, while the use of concrete materials and differentiated instructional strategies had not yet been optimized.

These challenges indicate the need for instructional innovation capable of bridging the learning needs of slow learners and the expected mathematics competencies. Therefore, this study was conducted as Classroom Action Research to improve multiplication skills through the use of number cards based on content-differentiated instruction among Grade VII slow learners at SMP Negeri 2 Muara Ancalong. The study is expected to provide theoretical contributions to the development of adaptive mathematics instruction and practical contributions to teachers in creating learning environments that are more inclusive, concrete, and responsive to students' characteristics.

Based on the problems and research gaps described above, improving multiplication skills among slow learners requires an instructional approach that focuses not only on academic outcomes but also considers students' cognitive developmental characteristics, individual learning needs, and meaningful learning experiences. Mathematics instruction for slow learners needs to be designed through systematic, concrete, and flexible processes so that students have equitable opportunities to understand mathematical concepts according to their actual abilities. The use of number cards combined with content-differentiated instruction represents a strategic alternative because it integrates visual, manipulative, and instructional adaptation components within a single learning process.

Number cards provide external support that helps students visualize multiplication concepts that were previously abstract. Through activities involving observing, grouping, matching, and completing numerical patterns, students can progressively develop understanding from concrete experiences toward mathematical symbols. Meanwhile, content differentiation enables teachers to adjust the level of instructional difficulty according to students' initial abilities. The combination of these approaches provides slow learners with opportunities to experience incremental learning success, which may ultimately enhance their motivation, self-confidence, and engagement in mathematics learning.

From an inclusive education perspective, adaptive instructional strategies are essential because

students differ in their characteristics and learning rates. Effective instruction is determined not only by teachers' ability to deliver content but also by their ability to adapt instructional strategies, media, and levels of complexity to learners' needs. This principle is consistent with inclusive education, which recognizes learner diversity as a fundamental consideration in designing equitable and meaningful learning experiences (Ainscow, 2020). Therefore, implementing differentiated instruction for slow learners is intended not only to improve academic performance but also to create a learning environment that provides opportunities for all students to develop.

This study is particularly important because multiplication is a foundational computational skill with long-term implications for students' success in learning other mathematical concepts. Failure to master multiplication at the junior high school level may become a barrier to learning more complex mathematical topics, including fractions, ratios, equations, and contextual problem solving. Therefore, appropriate instructional interventions are needed to help slow learners establish a strong foundation in numeracy. Unlike previous studies that have generally used number cards or manipulative materials primarily as tools for memorizing computational facts, this study situates number cards within a content-differentiated instructional framework. In other words, the media are not used merely as visual tools but are designed according to individual student needs through variations in difficulty level, amount of practice, problem format, and instructional sequence. This approach offers novelty by integrating the principles of concrete representation, instructional adaptation, and reflective action research within a single intervention design.

Another aspect of the study's novelty lies in its research context, namely slow learners at the junior high school level. Most studies concerning the use of concrete materials in mathematics have been conducted in early childhood or elementary education, whereas the need for adaptive mathematics instruction at the junior high school level has received comparatively limited attention. However, slow learners at the junior high school level continue to require concrete and gradual instructional approaches because their academic development does not necessarily follow the same trajectory as that of typically developing students. This study seeks to address this gap by providing empirical evidence regarding the effectiveness of number cards combined with content differentiation in improving multiplication skills.

Accordingly, this study aims to improve multiplication skills through the implementation of number cards based on content-differentiated instruction among Grade VII slow learners at SMP Negeri 2 Muara Ancalong. Specifically, the study aims to describe the implementation process of number cards in mathematics instruction, analyze improvements in students' multiplication skills following the intervention, and identify changes in students' engagement and independence throughout the learning process. Theoretically, this study is expected to contribute to the development of adaptive mathematics education, particularly regarding instructional strategies that combine concrete materials and differentiated instruction for students with specialized learning needs. Practically, the findings may serve as a reference for mathematics teachers, special education teachers, and educational practitioners in developing learning experiences that are more flexible, inclusive, and responsive to the characteristics of slow learners.

METHOD

This study employs a Classroom Action Research (CAR) approach aimed at improving multiplication skills through the use of number cards as a teaching aid based on content-differentiated instruction for students with learning difficulties. CAR was chosen because it allows teachers and researchers to directly identify learning problems, implement corrective actions, and evaluate the resulting changes through a process of continuous reflection (Kemmis et al., 2014). The study was conducted in two cycles, each consisting of four main stages: planning, acting, observing, and reflecting, in accordance with the action cycle model proposed by Kemmis and McTaggart. The study was conducted during the even semester of the 2025/2026 academic year in the 7th-grade class at Muara Ancalong State Junior High School 2. The research subjects consisted of students with learning difficulties who experienced obstacles in understanding multiplication operations. Subject selection was based on the results of initial identification through classroom observations, documentation of learning outcomes, and interviews with the mathematics teacher. The subjects' characteristics indicated difficulties in memorizing multiplication facts, understanding relationships between numbers, solving multi-step multiplication problems, and requiring more time and assistance to complete mathematics tasks.

The research intervention involved the use of number card media developed based on the principle of content differentiation. The learning materials were tailored to the students' readiness levels through variations in number complexity, the number of problems, forms of visual representation, and practice stages. The content differentiation approach allows teachers to adapt materials based on individual learning needs so that each student has the opportunity to learn according to their actual abilities (Tomlinson, 2017). Data collection was conducted through observation, multiplication skill tests, documentation, and field notes. Research instruments included observation sheets of student learning activities and learning outcome tests that measured students' ability to understand multiplication concepts, accuracy in calculation, and independence in solving problems. Quantitative data were analyzed using the percentage increase in learning outcomes, while qualitative data were analyzed through data reduction, data presentation, and drawing conclusions (Miles et al., 2020). The success of the intervention was determined based on the increase in students' multiplication proficiency scores until they met the minimum proficiency criteria, as well as positive changes in students' engagement and independence in learning.

RESULTS AND DISCUSSION

This classroom action research aimed to improve students' multiplication skills through the implementation of number cards based on differentiated content instruction among slow-learning students in Grade 7 at SMP Negeri 2 Muara Ancalong. The intervention was conducted in two cycles, with each cycle consisting of the planning, action, observation, and reflection stages. The results showed that the implementation of number cards developed according to the principles of content differentiation gradually improved students' multiplication skills in terms of calculation accuracy, conceptual understanding, and independence in completing mathematics tasks.

During the initial condition (pre-cycle), observations indicated that the students experienced

difficulties in understanding the basic concept of multiplication. The students tended to memorize multiplication facts without understanding the relationships among numbers, which often resulted in errors when they encountered different types of problems. Difficulties were also observed when students had to perform multiplication operations involving larger numbers, determine the appropriate solution procedures, and maintain concentration throughout the learning process. Based on the initial assessment, the students' multiplication skills remained at a low level, with the average achievement not yet meeting the predetermined mastery criteria. This condition indicated that the previous learning approach, which relied predominantly on textbooks and written exercises, had not fully accommodated the learning needs of slow-learning students.

In Cycle I, the intervention was implemented using number cards with instructional content adjusted to students' ability levels. Content differentiation was applied through the simplification of numbers, provision of graduated exercises, use of cards containing visual representations, and reduction of problem complexity. The observation results showed positive changes in students' engagement during the learning process. The students began to show greater interest in mathematical activities because the use of number cards provided a more concrete and interactive learning experience. In addition, students began to recognize simple multiplication patterns, match number cards with the corresponding answers, and solve basic multiplication problems with teacher assistance.

Improvements during Cycle I were also evident in changes in students' learning behaviors. Before the intervention, students tended to remain passive and wait for teacher assistance whenever they encountered difficulties. After the implementation of number cards, students became more willing to attempt problems independently and correct their own calculation errors. Nevertheless, reflection on Cycle I revealed several remaining challenges, particularly in recalling multiplication facts, maintaining attention for extended periods, and solving problems with higher levels of difficulty. Therefore, the intervention continued into Cycle II with several improvements, including greater variation in number cards, reinforcement through repeated practice, and instructional content that was more closely aligned with students' developing abilities.

In Cycle II, the implementation of number cards based on differentiated content instruction produced more substantial improvements. Students began to understand multiplication as repeated addition rather than relying solely on memorization. Adjusting the level of instructional difficulty enabled students to learn according to their actual abilities, resulting in a more effective learning process. Students who had previously experienced difficulties in performing multiplication operations began to calculate more quickly and accurately. In addition to improvements in academic performance, changes were also observed in the affective domain, including increased self-confidence, learning motivation, and participation during classroom activities.

A comparison across the research stages revealed an improvement in students' multiplication skills from the pre-cycle to Cycle II. The improvement was evident in several key indicators, including the ability to recognize numbers, understand multiplication concepts, calculate operation results correctly, and complete tasks independently. Number cards provided visual and manipulative support that helped students connect abstract mathematical concepts with

concrete learning experiences. This finding supports previous research indicating that the use of manipulatives in mathematics instruction can help students understand concepts through concrete activities before progressing toward abstraction (Carbonneau et al., 2013; Ahmad & Siller, 2024).

Furthermore, the implementation of content differentiation provided learning opportunities that were more consistent with the characteristics of slow-learning students. Instructional content adapted to students' ability levels reduced the pressure caused by differences in ability between students. This finding is consistent with research on differentiated instruction showing that adapting instructional materials and strategies can improve student engagement and learning outcomes among students with diverse academic needs (Tomlinson, 2017; Insorio & Librada, 2025). Overall, the findings demonstrate that integrating number cards with differentiated content instruction had a positive impact on improving multiplication skills among slow-learning students. Number cards served as concrete learning aids that facilitated students' understanding of mathematical concepts, while content differentiation ensured that instructional materials were provided according to students' levels of readiness. These findings indicate that adaptive, visual, and gradual instructional strategies can serve as effective alternatives for mathematics instruction among slow-learning students in inclusive classrooms.

Table 1. Changes in Multiplication Skills Across Research Cycles

RESEARCH STAGE	STUDENTS' ABILITY LEVEL	MAIN FINDINGS
PRE-CYCLE	Multiplication skills were at a low level	Students experienced difficulties understanding multiplication concepts, recalling multiplication facts, and completing tasks independently.
CYCLE I	Initial improvement in multiplication skills	Students began to understand simple multiplication patterns through number cards but still required teacher guidance.
CYCLE II	Skills improved substantially	Students were able to perform multiplication operations more accurately, demonstrated greater independence, and became more actively engaged in learning activities.

DISCUSSION

The results showed that implementing number cards based on differentiated content instruction improved multiplication skills among slow-learning students in Grade 7 at SMP Negeri 2 Muara Ancalong. Improvements were evident from the pre-cycle through Cycle II in terms of students' understanding of multiplication concepts, calculation accuracy, and independence in completing mathematics tasks. These findings indicate that an instructional strategy combining concrete learning media with adaptations to students' ability levels can provide a learning experience that is more consistent with the characteristics and needs of slow-learning students.

During the initial stage of the study, students demonstrated various difficulties in understanding multiplication operations. The primary difficulties involved recalling

multiplication facts, understanding relationships among numbers, and independently applying calculation procedures. These conditions are consistent with the characteristics of slow-learning students, who generally require more time to understand academic concepts, need intensive repetition, and benefit from more concrete instructional support than typical learners (Heward, 2022). In mathematics instruction, slow-learning students often experience difficulties when concepts are presented abstractly because of limitations in processing symbolic information and retaining information in working memory. Hasibuan et al. (2022) found that slow-learning students in inclusive classrooms frequently encounter difficulties in understanding mathematical concepts and therefore require instructional materials that are presented in simpler, more gradual forms and supported by visual aids.

The improvement in students' abilities following the implementation of number cards indicates that concrete learning media contributed positively to the development of mathematical conceptual understanding. Number cards enabled students to engage in learning through visual and manipulative experiences, making previously abstract multiplication concepts easier to understand. Through activities such as observing numbers, matching cards, arranging multiplication patterns, and engaging in repeated practice, students had opportunities to establish connections between concrete representations and mathematical symbols. This finding is consistent with Bruner's (1966) theory, which explains that effective learning develops through three stages of representation: enactive, iconic, and symbolic. At the enactive stage, students understand concepts through the manipulation of concrete objects, which then develops into visual understanding before progressing to abstract mathematical symbols.

The effectiveness of number cards in this study is further supported by research on the use of concrete manipulatives in mathematics instruction. Carbonneau et al. (2013), through a meta-analysis, demonstrated that the use of manipulatives can help students understand mathematical concepts by providing learning experiences that connect physical activities with mathematical representations. Concrete learning media not only function as visual aids but also help reduce students' cognitive load when learning new concepts. For slow-learning students, such concrete support is particularly important because they require more opportunities to observe, practice, and repeat concepts before achieving stable understanding.

In addition to the role of instructional media, the improvement in the research outcomes was also influenced by the implementation of differentiated content instruction. Before the intervention, mathematics instruction tended to use the same materials and level of difficulty for all students. This condition created difficulties for slow-learning students because the instructional content was not fully aligned with their actual abilities. Through content differentiation, the teacher adjusted the complexity of problems, the amount of practice, the format in which materials were presented, and the instructional sequence. This strategy enabled students to learn according to their level of readiness, thereby making the learning process more effective.

This finding supports Tomlinson's (2017) view that differentiated instruction enables teachers to provide learning experiences based on students' needs, readiness, and characteristics. Differentiation does not mean lowering academic standards; rather, it

provides different pathways through which students can achieve the intended learning objectives. In the context of this study, slow-learning students were still expected to develop multiplication skills, but they did so through simpler instructional stages and with more intensive support.

The improvements observed in Cycles I and II also demonstrate that gradual instruction contributed to students' skill development. In Cycle I, students began to improve their ability to recognize numbers and understand simple multiplication patterns, although they still required teacher assistance. Following reflection and instructional modifications in Cycle II, students demonstrated greater progress in completing multiplication operations independently. This change suggests that slow-learning students require systematic, repetitive, and consistent instruction for newly learned concepts to become more firmly retained in long-term memory.

From the perspective of mathematics instruction for students with special educational needs, providing instruction in gradual and explicit steps is an important strategy. Gersten et al. (2009) explained that students experiencing difficulties in mathematics require structured instruction involving examples, guided practice, immediate feedback, and sufficient opportunities for practice. This principle was reflected in the present study when the teacher provided support through number cards, demonstrated solution procedures, and gradually reduced assistance as students demonstrated greater independence.

The findings also revealed changes in students' motivation and engagement during the learning process. Before the intervention, students tended to be passive and lacked confidence when completing mathematics tasks. Following the use of number cards, students demonstrated greater enthusiasm because learning activities became more engaging and were no longer focused exclusively on written exercises. This finding indicates that instructional media can serve not only to improve cognitive abilities but also to create more positive learning experiences for slow-learning students. Permatasari et al. (2022) explained that slow-learning students require instructional approaches that provide opportunities for gradual success so that their motivation and academic self-confidence can develop.

Compared with previous studies, this study makes a novel contribution by integrating number cards with differentiated content instruction in the context of slow-learning students at the junior high school level. Previous studies have more commonly examined the use of concrete media or differentiated instruction separately. The present study demonstrates that combining manipulative media with instructional content adaptation can provide more comprehensive support because the media facilitate conceptual understanding, while differentiation ensures that the instructional content is aligned with students' individual needs. Thus, the findings of this study imply that mathematics instruction for slow-learning students should be designed around the principles of accessibility, conceptual concretization, and instructional flexibility. Number cards based on differentiated content instruction can serve as an effective instructional alternative because they are easy to implement, relatively inexpensive, and adaptable to students' varying ability levels. This study reinforces the importance of implementing adaptive mathematics instruction in inclusive education to ensure that students with learning difficulties continue to receive meaningful opportunities to develop their potential optimally.

CONCLUSION

Based on the results of the classroom action research that was conducted, it can be concluded that the use of number card media based on differentiated content instruction is effective in improving multiplication skills among slow-learning students in the 7th grade at SMP Negeri 2 Muara Ancalong. The improvement in students' abilities was evident in stages from the pre-cycle phase through Cycle I to Cycle II, in terms of their understanding of multiplication concepts, accuracy in performing calculations, and independence in completing math assignments. The use of number card media provided visual and hands-on support that helped students transform the previously abstract concept of multiplication into something more concrete and easier to understand. Through activities such as matching, grouping, and gradually completing exercises, students gain a more meaningful learning experience and are able to build conceptual understanding progressively. Meanwhile, the application of content differentiation allows teachers to adjust the difficulty level of the material based on students' abilities and learning needs, making the learning process more inclusive and responsive to the characteristics of students with learning difficulties. This study demonstrates that the integration of concrete media and adaptive learning strategies can serve as an effective alternative for improving the mathematics skills of students with learning disabilities. These findings provide practical implications for teachers to develop flexible, systematic, and student-centered mathematics instruction, particularly within the context of inclusive education.

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