



Development of a Differentiated Learning Model Through the Sport Education Model Invasion Game at an Elementary School

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Abstract

This research is motivated by the low quality of differentiated learning implementation in Physical Education (PJOK) lessons at the elementary school level, especially in Wonokerto District. Many teachers still use conventional learning methods, with minimal student participation and limited teaching modules less suited to local needs and contexts. This research aims to develop a differentiated learning model with a *Sport Education Model* (SEM) approach through *invasion games*. This model is designed to create an interesting, contextual learning experience and can adapt to the characteristics and potential of students.

The study used the *Research and Development* (R&D) method with the ADDIE approach, which includes the stages of Analysis, Design, Development, Implementation, and Evaluation. The research subjects comprised 112 students and 4 Physical Education and Health (PJOK) teachers. The instruments included expert validation (materials, media, and pedagogy), teacher and student response questionnaires, and affective assessment.

The research results show that the differentiated learning model based on *the Sports Education Model* is feasible and effective for implementing Physical Education (PJOK) instruction in elementary schools. This model can increase active student engagement, create a pleasant learning environment, and adapt to the characteristics and needs of students.

A differentiated learning model through *Sport Education. The invasion game*-based model has proven more effective than conventional learning approaches in increasing student active engagement and motivation in elementary school Physical Education (PJOK) subjects. This model received an "excellent" rating from subject matter, media, and pedagogical experts and positive feedback from students and PJOK teachers.

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INTRODUCTION

Education plays a crucial role in preparing students for future challenges. Several educational experts have expressed their views on how education can prepare students for an ever-evolving world (Abadi et al., 2024). According to Erikson et al. (2023), education should focus on developing critical thinking skills and adaptability by providing hands-on experiences relevant to real life. Mahanal (2014) emphasizes that learning should teach factual knowledge and the skills to think and interact with the world actively. Furthermore, according to Amalia (2022), learning should foster critical thinking, innovation, and adaptability, which are essential in a world of technological and social changes.

The Independent Curriculum implemented in Indonesia aims to give schools the freedom to develop learning methods that are more relevant to the needs and characteristics of students. One of the main focuses of the Independent Curriculum is the Pancasila Student Profile Strengthening Project (P5), which aims to develop students' holistic competencies, including knowledge, skills, and character.

In the learning process, teachers must be able to meet the needs and interests of students, with a more diverse, creative approach, and oriented towards real experiences (Rahman et al., 2024).

However, although the Independent Curriculum provides teachers with extensive freedom to develop more creative and innovative learning methods, implementing learning at the elementary school level, particularly in Wonokerto District, still faces many challenges. Based on the researcher's initial observations at the Wonokerto District Sports Teacher Working Group (KKG) meeting, quite striking facts were found regarding the quality of learning implementation in local elementary schools. Most teachers in Wonokerto District still rely on conventional learning methods that focus on teaching fundamental techniques without

considering students' individual needs. Learning is often designed without considering students' local context and characteristics, so it is not uncommon for students to feel bored and tired. This is evident in the many students who often sit on the edge of the field or take shelter under trees. Many female students excused themselves from participating in Physical Education learning activities because of the hot sun and feeling reluctant to do the activities.

Based on interviews with several physical education (PJOK) teachers in Wonokerto District, the methods typically focus on teaching the basic techniques of a specific sport that students must master. In reality, learning is often spent listening to teachers explain or watching demonstrations of techniques, while students are limited in their opportunities to practice these techniques. Limited facilities and infrastructure, such as limited sports equipment and limited space, exacerbate the situation, often requiring students to wait their turn to practice the basic techniques taught. This situation reduces student engagement in the active learning process, which risks decreasing their interest and motivation to participate in PJOK learning.

One of the main problems identified during observations was that almost all teachers in Wonokerto District did not adhere to independently developed teaching modules. Instead, they often used downloaded teaching modules from the internet, which were only adapted to the identity aspect without considering the relevance of the content to the conditions and needs of students in the local environment. This was due to several factors, including the limited time teachers had to develop teaching modules appropriate to the local context. Most teachers lacked the time to create or adapt their teaching modules due to the administrative burden and additional duties they carried.

This phenomenon impacts the quality of classroom learning. Teachers who lack

adequate teaching modules tend to teach without a clear understanding, resulting in a lack of variety and depth in learning. A teaching module is a learning tool or design developed based on the curriculum, implemented to achieve predetermined competency standards (Setiawan et al., 2022). Teaching modules play a crucial role in helping teachers design the learning process. Teachers play a crucial role in developing teaching materials and honing their thinking skills to innovate and create teaching modules (Nurdyansyah, 2018).

Therefore, creating teaching modules is a pedagogical competency teachers must develop. This ensures that teaching techniques in the classroom are more effective and efficient, and do not deviate from the discussion of achievement indicators (Setiawan et al., 2022). One of the main characteristics of teaching modules is that they have appeal, meaning, and challenges, which are expected to arouse interest in learning and encourage active student involvement in the learning process (Mea, 2024).

The characteristics of Physical Education, Sports, and Health (PJOK) learning at the elementary school level present unique challenges, given its role beyond physical development to character development and social skills. Elementary school students have short attention spans and can quickly lose interest if the learning environment is uninteresting or irrelevant to their lives (Bernal et al., 2024).

Repetitive teaching methods are a significant factor in student boredom because they do not provide opportunities for students to engage in holistic experiences (Tul'adawiyah et al., 2024). Therefore, creative teaching approaches are needed to maintain student engagement and thus improve the quality of learning. The Sports Education Model can be an option for creating enjoyable learning, stimulating active engagement, and fostering holistic

character development, in line with the spirit of the Independent Curriculum.

The Sport Education Model is a learning approach developed by Daryl Siedentop in 1994 that aims to integrate sports learning with developing social and personal skills through structured, authentic play experiences (Bete & Saidjuna, 2022). emphasizes teaching through games that allow students to play an active role, whether as players, coaches, referees, or spectators, thus providing a comprehensive experience in every physical activity they do (Estrada-Oliver et al., 2024).

SEM encourages students to participate actively and fosters a sense of responsibility, cooperation, and respect for others (Slamet et al., 2022a). Thus, the SEM approach is efficacious in improving students' physical skills and significantly contributes to character development and social skills, which aligns with the objectives of the Independent Curriculum, which prioritizes holistic competency development for each student.

Therefore, this study aims to develop a differentiated learning model for elementary schools through *the Sport Education Invasion game model*. Through this model, it is hoped that teachers will have clear guidance that can be adapted to local conditions and student needs, thereby making learning more effective, enjoyable, and relevant to the objectives of the Pancasila Student Profile Strengthening Project (P5) within the Independent Curriculum.

METHODS

The method used in this study was Research and Development (R&D) with a mixed methods approach, combining qualitative and quantitative methods. The research design used in the product trial phase was a quasi-experimental *one-group pretest-posttest model*. This experimental model involves one group of subjects who were given a pretest before and a posttest after

treatment, without a comparison control group.

Data was collected from three experts (material, media, and pedagogy experts),

120 fifth-grade students and four physical education teachers from two public elementary schools in Wonokerto District. This study followed the ADDIE development model, which consists of three main phases: preliminary study, development, and evaluation.

RESULTS AND DISCUSSION

Analysis

The process in this study includes two main activities. First, a literature study was conducted to strengthen the conceptual basis for developing a differentiated learning model by reviewing the elementary school curriculum and *invasion game materials*. Second, a field study was conducted at SD Negeri 02 Pecakaran, Wonokerto District, to assess the condition of learning facilities and identify teacher and student needs related to implementing the designed learning model.

Literature study

A literature review was conducted to develop an initial conceptual model for differentiated learning. In this stage, researchers analyzed the curriculum currently in effect in elementary schools, namely the Independent Curriculum. This curriculum allows teachers to design learning tailored to students' needs, potential, and characteristics while also considering the context and conditions of the school environment. Furthermore, researchers also examined *invasion game material*, focusing on basketball as a modified form of the large ball game. These modifications included simplifying the rules and equipment, and adjusting the court size to make the game more adaptable to the conditions and characteristics of elementary school students.

Invasion game, a modified basketball version, is an effective learning tool for elementary schools. These modifications

include simplifying the rules, reducing the number of players, adjusting the court size, and using equipment that better suits students' physical characteristics and developmental needs. This game not only trains basic motor skills such as dribbling, throwing, and shooting, but also develops an understanding of simple game tactics such as teamwork, offensive strategies, and defense. Applying the *Sports Education Model approach* in this learning allows students to engage in various roles according to their potential and interests, thus encouraging active participation and a sense of responsibility. Furthermore, this model supports the principle of differentiated learning in the Independent Curriculum, which emphasizes flexibility and focuses on student needs. Overall, learning about big ball games through basketball improves students' cognitive, psychomotor, and affective aspects and creates a fun, contextual, and meaningful learning environment.

Field Study

1. Teacher needs analysis

Data collection at this stage was conducted through a questionnaire to obtain information regarding the implementation of ongoing learning and to provide reinforcement to teachers regarding implementing the *sports education games model* in the classroom, including the necessary learning stages and the necessary facilities and infrastructure. The research subjects consisted of four physical education teachers at the elementary school level. The data obtained were used to evaluate the suitability between teacher needs and real-world conditions, which became the basis for formulating appropriate solutions to improve learning outcomes and meet student needs.

Based on interviews with four physical education teachers with more than five years of experience and who had participated in the PKG PJOK program, it was found that all respondents understood the basic concepts of the Sport Education Model (SEM). They understood that SEM is a learning approach

that creates a realistic competitive atmosphere in the classroom, for example, by forming leagues, assigning roles such as players, coaches, referees, or observers, and systematically managing matches. Although this concept was well understood, its implementation in elementary schools was still limited. Most new teachers implemented small elements of SEM, such as forming teams or assigning limited roles to students, without using the comprehensive approach.

Teachers conveyed several critical needs that must be met to support the effective implementation of SEM. One of the primary needs is a comprehensive and applicable learning module. This module is expected to include technical guidelines for SEM implementation, examples of lesson plans and assessment rubrics, game scenarios, and differentiated learning strategies relevant to the characteristics of elementary school students.

Furthermore, specific training on SEM implementation is crucial. Teachers still need direct guidance in designing role-based learning, managing sports class dynamics, and conducting evaluations by SEM principles. Ongoing supervision from the school or department is also necessary for optimal SEM implementation.

Limited facilities and infrastructure also pose a significant obstacle to implementing this model. Teachers cited the lack of facilities such as sports fields, game equipment, scoreboards, whistles, and team vests as major obstacles. Some even suggested providing additional tools such as strategy boards, stopwatches, and simple assessment tools. SEM-based physical education (PJOK) learning is challenging to implement optimally without adequate facilities. Therefore, support from school principals and education offices in the form of supportive policies, provision of facilities, and allocation of additional time is essential.

Another equally important challenge is the issue of student differentiation and social issues in the classroom, particularly related to

gender differences. Teachers observed that female students were often less engaged in physical activities due to the dominance of male students, creating unequal participation. This highlights the need for more detailed differentiation guidelines to enable teachers to create an inclusive and equitable learning environment. Overall, teachers expressed high enthusiasm for the potential of SEM, but implementing this model still requires strengthening teacher capacity, providing supporting tools, and a policy framework that supports innovative physical education learning in elementary schools.

These findings indicate that physical education (PJOK) learning still faces several obstacles, particularly related to time and the limited learning modules developed. Furthermore, support in teacher training, ongoing supervision, adequate facilities and infrastructure, and school policies are crucial. Therefore, it is necessary to develop a learning model based on *the Sport Education Model* (SEM) that is practical, easy for teachers to understand, and appropriate to the characteristics of elementary schools. This module includes comprehensive components such as learning steps, assessment rubrics, and game scenarios that support contextual and creative learning and foster sportsmanship values.

2. Results of student needs analysis

A needs analysis was conducted in four elementary schools in Wonokerto District, involving fifth-grade students in each school, with a total of 90 students. Data collection was conducted through questionnaires distributed to students to explore their needs in physical education learning, specifically regarding the *invasion game material* and appropriate learning approaches. The questionnaire results provide an overview of the various challenges students face, preferences regarding learning styles, and the need for more varied learning models appropriate to student characteristics. This analysis shows that most students need

learning that can encourage active student roles in the classroom and increase physical activity directly during the learning process.

Table 1. Student Needs Results

No	Indicator	Yes (%)	No (%)
1	Physical Activity Experience	90.6%	9.4%
2	Engagement in Learning	92.4%	7.6%
3	Role in Learning	89.3%	10.7%
4	Diversity of Activities and Challenges	92.4%	7.6%
5	Character Enhancement	89.7%	4.9%
6	Involvement in Decision Making	92.9%	7.1%
7	SEM Learning Effectiveness	91.1%	8.9%

The needs analysis results indicate that students require physical education instruction that emphasizes physical skills and encourages active involvement, role variation, and character development through meaningful activities. Therefore, developing a differentiated learning model based on the *Sport Education Model* is a strategic choice to address the needs of elementary school students, particularly in the context of learning about invasion games.

3. Design stage

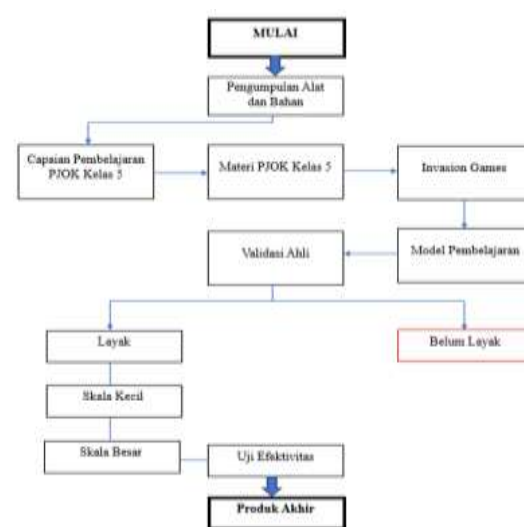
The second stage in the ADDIE development model is the *design stage*, a strategic phase in designing the instructional foundation of the product to be developed. This stage includes a series of systematic activities, beginning with the formulation of learning objectives that align with the needs analysis results in the previous stage. Next, the learning scenario is designed, which is poured into a module structure, and the preparation of material points that represent the *Sport Education Model* (SEM) approach in a contextual and applicable manner in PJOK learning at the elementary school level. In this stage, researchers structure the module script, including the flow of material delivery as a *flowchart* to illustrate the learning process visually and logically. This design also involves collecting supporting materials, such as literature sources, evaluation instruments, and learning tools that support the successful implementation of SEM in the classroom. In addition, the design of learning media and evaluation tools is also prepared to measure the feasibility, effectiveness, and achievement

of learning objectives in a predetermined context. All components designed at this stage are procedural and measurable, which will later become the basis for the product development process in the next stage. The design was carried out by integrating the pedagogical principles and participatory approach inherent in SEM, so that the resulting product can encourage active student involvement and accommodate the diverse characteristics of students in elementary schools. The product *flowchart* is illustrated in the following figure.

4. Discussion of development stages

a. Analysis stage

The analysis phase is the initial foundation in the ADDIE instructional design approach, emphasizing the importance of understanding learning needs before designing solutions (Winaryati, 2021). In the context of this research, the analysis phase focuses on two aspects: theoretical review through literature and empirical review through field studies. The literature review aims to examine the concept of differentiated learning (Pratama, 2022), which emphasizes the importance of adjusting instructional strategies based on students' readiness, interests, and learning



profiles. The Independent Curriculum provides ample space for teachers to implement differentiation strategies according to the local context and student

characteristics, as mandated by the Ministry of Education, Culture, Research, and Technology (2022).

By reviewing this curriculum and theories on the Sport Education Model (Slamet et al., 2022a), researchers built a conceptual basis for designing an integrative learning model. A field study was conducted to verify the suitability of theory and reality. Through interviews and questionnaires with teachers and students, it was found that although teachers understood the SEM concept, its implementation was still partial due to limited resources and a lack of training. This is in line with the findings of Ropiyah et al. (2024) that the successful implementation of pedagogical approaches in PJOK is greatly influenced by teacher readiness and facility support.

From the student perspective, the questionnaire results showed that over 80% of students desired more participatory and enjoyable learning, with various roles and activities. These results reinforce the opinion of Ropiyah et al. (2024) regarding the importance of active engagement in learning as a driver of cognitive and social development. Therefore, the needs analysis results provide a strong foundation for designing a contextual learning model responsive to real-world needs.

b. Design stage

The design stage is a strategic step to construct an instructional framework for the developed learning product. Samsudin (2024) states that learning design includes determining objectives, developing content, developing delivery strategies, and developing evaluation tools. In this study, the design focused on developing an SEM-based Physical Education (PJOK) learning module that can be implemented in elementary schools. This module was designed by considering the main principles of SEM, namely season structure, team affiliation, student roles, formal competition, record keeping, and festivity (Siedentop et al., 2019).

Learning objectives are formulated based on an analysis of student and teacher needs. The material is designed to be applicable and appropriate to the abilities of elementary school students. A flowchart illustrates the flow of learning activities, considering continuity and student involvement in various roles such as players, coaches, referees, and observers. This aims to foster social skills, responsibility, and a spirit of sportsmanship. The assessment rubric and learning media are also designed to adhere to the principles of *authentic assessment*. (Nisrokha, 2018), so that the assessment reflects students' real involvement and development during the learning process.

This design stage produces a module design that is structured, systematic, and ready to be tested in the subsequent development stage.

5. Stages of feasibility of the SEM learning model

a. Research results on the feasibility assessment of learning models

Evaluation of the feasibility of the differentiated learning model based on the Sport Education Model focused on the *Development stage* within the ADDIE framework. At this stage, a validation process was conducted involving three experts according to their respective fields of expertise: a material expert, a media expert, and a pedagogical expert. Furthermore, feedback from direct users, namely elementary school teachers and students, was also assessed as an effort to triangulate data and strengthen product quality. Validation by material experts aimed to assess the relevance of the content to core competencies, the integration between the material and the SEM approach, and its compliance with the principles of differentiated learning as mandated by the Independent Curriculum (Kristiani et al., 2021). Aspects assessed included conceptual accuracy, completeness of information, and the depth of material developed in the module.

Meanwhile, validation by media experts focused on the visual design, readability, and functionality of the learning media, including clarity of presentation and visual appeal. This approach aligns with the principles of *instructional media design*, which emphasize visual effectiveness in supporting learning (Ali et al., 2024). Evaluation was conducted to ensure that the developed media optimally facilitated student understanding in the context of physical education (PJOK) learning.

Furthermore, validation by pedagogical experts assesses the module's functionality within the context of the teaching and learning process, particularly in terms of instructional strategies, participatory approaches, and the module's potential to increase active student engagement. This perspective is based on the *constructivist learning theory framework*. (Hein, 1991) emphasizes the importance of social interaction and authentic learning experiences as the foundation for meaningful learning. The three experts conducted independent validation to ensure the objectivity of the assessment, using instruments specifically developed for each field. The validation data was then analyzed to determine the product's feasibility and to serve as a basis for revisions in refining the module. By involving various experts and direct users, this stage is crucial in determining whether the developed learning model is feasible, relevant, and ready for implementation in elementary education settings.

a. Subject matter expert

In this study, the subject matter experts consisted of one lecturer and two elementary school physical education teachers who deeply understood the curriculum, the Sport Education Model (SEM) approach, and the principles of differentiated learning. The three experts assessed six leading indicators: the relevance of the material to core competencies, the integration of the material with the SEM approach, and the suitability of

the content to the principles of differentiated learning. The results and analysis of these assessments will be elaborated to provide input for product improvement and refinement.

Table 4.3 1 of Material Expert Assessment

Indicator	N	Subject Matter Expert			Mean	Information
		Expert 1	Expert 2	Expert 3		
Suitability of Material with Curriculum	9	3.67	4.00	3.67	3.78	Very good
Suitability of Material to Learning Objectives	9	3.67	3.67	4.00	3.78	Very good
Student Learning Needs	12	3.75	3.75	4.00	3.83	Very good
Character Strengthening	9	3.67	3.67	4.00	3.78	Very good
Elementary School Learning Context	6	4.00	4.00	4.00	4.00	Very good
Completeness and Integration of Material	12	3.75	3.75	3.50	3.67	Very good

The average score was perfect based on the assessment results from three subject matter experts on six indicators. These validation results indicate that the module's material is suitable for use and should be continued to the next development stage.

b. Media expert

In this study, media expert validation was conducted by two lecturers and one elementary school physical education teacher competent in learning design and educational media development. The assessment focused on five main aspects: visual design, readability, completeness of information, functionality, and visualization of the learning media. The results of this evaluation serve as the basis for refining the Sport Education Model-based learning module to make it more effective in supporting interactive and enjoyable teaching and learning processes at the elementary school level.

Table 2 Media Expert Assessment Results

Table 2: Media Expert Assessment Results						
Indicator	N	Subject Matter			Mean	Information
		Expert				
		Expert 1	Expert 2	Expert 3		
Design and Layout	15	3.6	3.6	3.6	3.8	Very good
Readability and Language	15	3.75	3.00	3.50	3.42	Very good
Completeness of Information	15	3.60	3.80	3.60	3.67	Very good
Ease of Use	15	3.60	4.00	3.60	3.73	Very good
Visual and Media Support	15	3.40	3.60	3.60	3.53	Very good

Based on the assessment results of three media experts on five indicators, the quality of the learning media is classified as very good. The indicator with the highest score is design and layout (mean 3.8), which indicates that the module's visual appearance is attractive and easy to understand. Ease of use (mean 3.73) and completeness of information (mean 3.67) also received high ratings, indicating that the module is reasonably practical to use and the information presented is quite comprehensive. Visual and media support received a score of 3.53, reflecting that the image or illustration elements in the module already support the delivery of the material well.

However, readability and language still need some improvement, with a mean score of 3.42, to make them easier to understand. Overall, these results indicate that the developed learning media have met eligibility standards and are ready for the next stage of development with minor refinements.

6. Pedagogical expert

The pedagogical experts in this study included two lecturers and one elementary school teacher with expertise in the field of learning. These three experts assessed the learning strategies used in the module, particularly in encouraging active student involvement and strengthening student character. This assessment focused on the extent to which the learning approach in the module created a participatory and inclusive

learning atmosphere and fostered positive values such as responsibility, cooperation, and sportsmanship. The results of this assessment were then systematically analyzed and used as the basis for revising and refining the *Sport Education Model-based learning module* being developed.

Table 4.3 3 of Pedagogical Expert Assessment

Indicator	N	Subject Matter			Mean	Information
		Expert				
		Expert 1	Expert 2	Expert 3		
Integrated Learning Strategies	15	3.60	3.40	3.40	3.47	Very good
Active Student Involvement	15	3.60	3.60	3.40	3.53	Very good
Strengthening Student Character	15	3.60	3.80	3.40	3.60	Very good

Based on the assessment results from three pedagogical experts, all indicators received an *outstanding category*. The highest indicator was Strengthening Student Character, with an average score of 3.60, indicating that the module is quite good at instilling character values. The Active Student Involvement indicator was also assessed as very good with a score of 3.53, which means the module can encourage students to be active in learning. Meanwhile, the Integration of Learning Strategies obtained an average score of 3.47, still classified as very good. However, it could be further improved so that the learning strategy is more focused and integrated. Overall, these results indicate that from a pedagogical perspective, the module is suitable for use and supports learning in elementary schools.

7. Feasibility test

a. Small-scale test

Based on a small-scale trial conducted at Pecakaran 02 Public Elementary School, several important findings were obtained regarding the effectiveness of implementing the Sport Education Model (SEM) in physical education (PJOK) learning. The trial involved one class of 30 students, with stages ranging

from providing an understanding of the SEM concept, implementing games based on the model, and completing an evaluation form.

First, in terms of effectiveness, the SEM model demonstrated excellent results, with an average evaluation score of 82%. This demonstrates that this approach positively improves student skills and attitudes, including teamwork, responsibility, sportsmanship, time management, creativity in games, and social interaction and leadership.

Second, from a student perspective, most students responded positively to learning using the SEM approach. They found this model enjoyable, engaging, and beneficial. The learning, packaged in simple games and with a system of competitions and celebrations, was deemed effective in creating a contextual and meaningful learning environment, while simultaneously increasing students' motivation and engagement in the learning process.

Third, based on the feedback given, several students also suggested that the SEM approach should not only be applied to basketball material, but also be developed for other materials in PJOK learning.

This shows that the SEM approach has the flexibility and potential to be applied widely in various learning contexts.

Some student comments that support these findings include:

Student 1: "The game was enjoyable. I was able to work together with my teammates. This learning can be done for other games."

Student 2: "I can work together with my teammates. I hope that in the next lesson, there will be sports games like this again, ma'am."

Student 3: "I am happy and can participate in game activities according to my role."

Student 4: "The learning activities were fascinating and exciting."

Student 5: "Similar learning can be done for other games."

These statements reinforce that the *Sport Education Model approach* can create an active, collaborative learning environment and encourage the development of character values through enjoyable physical activities.

a. Large-scale testing

Based on the results of a large-scale trial conducted in two elementary schools involving 112 students and four physical education (PJOK) teachers, it can be concluded that the *Sport Education Model* (SEM)-based learning model demonstrated excellent effectiveness and acceptance. No technical obstacles were encountered during the implementation process that hampered the model's implementation. Student evaluations yielded an average score of 89%, while teacher evaluations yielded 96%. These results indicate that the SEM approach was positively received by both students and teachers and effectively supported the PJOK learning process.

Students' views on the implementation of this model were very positive. They found learning through the SEM approach engaging, enjoyable, and facilitated their active engagement in the learning process. They felt more enthusiastic about participating in the lesson, understood their roles in the game, and learned values such as teamwork, sportsmanship, and responsibility. Some students even hoped a similar learning model could be developed for other sports subjects. Some student statements reflecting their positive experiences include:

Student 1: "The game was enjoyable, I studied with my group mates and finished the game seriously."

Student 2: "I am thrilled and excited to participate in sports lessons, especially when there are fun games."

Student 3: "I am happy with my role in class because the teacher's games are fascinating and challenging."

Student 4: "Learning SEM is fun because I now know the position in the game that I have to win with my group."

Student 5: "Through this basketball game, I feel happy and can learn about teamwork and togetherness to win the game."

Positive feedback from students reinforces that the SEM learning model has great potential to be further developed in basketball material and other sports materials in the PJOK curriculum.

In addition to students, physical education and health teachers also expressed their appreciation for this learning model. They stated that the SEM approach supports differentiated learning, engages students actively, and helps teachers create a contextual, creative, and enjoyable learning environment. Some of the teachers' views include:

Teacher 1: "SEM is a form of differentiated learning tailored to student needs. With direct involvement and assigned roles, students appear active and engaged. This model is excellent for implementation at all levels."

Teacher 2: "The development of the SEM model is good, but the organization of students needs to be done carefully because of the importance of dividing roles in organizing the competition."

Teacher 3: "I hope that the SEM module can be developed in a practical, contextual, and adaptive manner to make it easier for teachers to apply it at various levels and to shape students' character holistically."

Teacher 4: "Hopefully, this development program can be accessed and implemented by all PJOK teachers."

Overall, the trial results indicate that the *Sports Education Model approach* is practical in supporting a fun and meaningful learning process, while comprehensively shaping students' skills and character. This model is suitable for implementation and further development in various physical education (PJOK) learning contexts at the elementary school level.

8. Learning model feasibility stage

This study aims to develop a differentiated learning model using the Sport

Education Model (SEM) approach for Physical Education (PJOK) subjects at the elementary school level. This model is designed to address the need for student-centered learning by providing space for students to learn according to their interests, learning styles, and readiness, as Tomlinson (2017) explained in the principle of differentiated instruction.

In the expert validation stage, the feasibility of the model development is tested by subject matter experts, media experts, and pedagogical experts. Validation is carried out to ensure that the material, display, and media presentation strategies are based on the principles of differentiated learning and are in line with the spirit of Social Emotional Learning (SEL). This validation is a crucial step in the learning media development process because it assesses the suitability of the content, visual appearance, and pedagogical meaningfulness of the developed media. The principle of differentiated learning emphasizes the importance of meeting individual learning needs based on students' readiness, interests, and learning profiles, so the developed media must be able to accommodate these differences (Wardani & Darmawan, 2024).

Meanwhile, SEM-based learning encourages the delivery of material that focuses not only on cognitive aspects, but also on students' social and emotional development (Naro et al., 2023). Validation is carried out to ensure that the module's material, display, and presentation strategies are in accordance with the principles of differentiated learning and the spirit of SEM. The Sport Education Model itself, as explained by (Siedentop et al., 2019), emphasizes a learning experience like a "sports season" with a learning structure that encourages active student roles, strengthening teamwork, and involvement in various roles (players, coaches, referees, managers, etc.).

Validation results indicate that the differentiated learning module using the sports education invasion game model for

elementary school students is feasible, with some technical improvements noted. Expert assessments confirm that this model aligns with the principles of differentiated learning and the SEM framework, which encourages active participation and conceptual understanding through real-world experiences.

In the small-scale pilot phase, initial implementation with students demonstrated that students easily understood the module. Student feedback indicated that the SEM approach made learning more engaging, contextual, and enjoyable. This aligns with the theory of Siedentop et al. (2019), which emphasizes the importance of learning in a social and collaborative context—values at the core of the SEM approach.

The results of this study align with research conducted by Slamet et al. (2022), which showed that invasion games significantly contribute to improving students' self-efficacy, cognitive development, problem-solving skills, and teamwork skills. Furthermore, this type of game also encourages improved physical fitness, self-confidence, and the ability to make quick and accurate decisions. Through a fun and challenging approach, invasion games create an integrated learning experience that develops physical abilities and fosters active participation and engagement in a dynamic and collaborative learning environment (Supriadi & Karisman, 2020).

Furthermore, the model demonstrated high effectiveness in a large-scale pilot phase involving 112 students and four physical education teachers in two elementary schools. The average student rating was 89%, and the average teacher rating was 96%. These results reflect the model's success in creating an inclusive, adaptive learning environment and building students' social and cognitive skills.

The integrated differentiated learning strategy in SEM allows students to learn in a way that best suits their learning profile (Sarie, 2022), which is supported by research conducted by Akbaruddin et al. (2024) that

the application of differentiated learning can significantly increase student motivation, engagement, and learning outcomes.

As offered in SEM, the application of roles in sports learning has been proven to shape students' character in terms of leadership, teamwork, responsibility, and sportsmanship. This aligns with the main principle of SEM, which states that the goal of sports learning is limited to mastering technical skills and strengthening affective and social values (Schiff & Supriady, 2023). Furthermore, teachers reported that this model significantly assisted them in managing their classes more effectively, providing diverse learning experiences, and encouraging the active participation of all students, including those who had previously been less involved in physical education (PJOK).

Thus, developing a differentiated learning model through the Sport Education Model approach is practical and suitable for use in PJOK learning in elementary schools.

9. Effectiveness stage of the SEM learning model

a. Paired test

The results of the *paired sample t-test* showed significant differences in students' affective aspects before and after implementing the Sport Education Model (SEM) in learning the Invasion Game in elementary schools. The significance value (Sig. 2-tailed) obtained was <0.05 , which indicates that this learning model statistically influenced improving students' attitudes and social-emotional values.

More specifically, improvements in the affective aspect include several key indicators: increased student confidence in participating in learning activities, increased sportsmanship in competition, increased ability to work together in a team, and a growing sense of responsibility and empathy towards peers. The average score of students' affective aspects after the treatment experienced a significant increase compared to the score before the treatment.

The Sport Education Model provides ample space for participation through social roles within the team, such as captain, coach, referee, or match observer. Placing students in these roles indirectly encourages them to be actively involved emotionally and socially (Kao, 2019). Students can learn to appreciate differences, resolve conflicts, motivate peers, and accept defeat and victory with maturity. This powerfully supports the development of affective aspects, an important foundation in physical education learning (Aprelyani, 2025).

Physical education at the elementary school level not only aims to develop physical and motor skills, but also has an important role in shaping students' character and affective aspects (Muhtar & Dallyono, 2020). One approach that has proven effective in achieving these goals is applying a *differentiated learning model* through the *Sport Education Model (SEM) approach*, especially in the *Invasion Game* (Farias et al., 2018; Slamet et al., 2022b).

Conceptually, the affective aspect of physical education encompasses the development of students' attitudes, values, emotions, motivation, and social behavior. This aspect is crucial because it forms the foundation for developing positive character traits, such as sportsmanship, empathy, cooperation, and a sense of responsibility. In traditional learning practices, the affective aspect often receives less attention because teachers focus more on mastering technical skills and cognitive outcomes (Rivas et al., 2024). However, with more inclusive and humanistic learning approaches like *the Sport Education Model*, teachers have more effective tools to stimulate students' emotional and social development.

The Sport Education Model is designed to mimic the structure of a real sports experience, consisting of phases such as long-term team formation, inter-team matches, role-playing (captain, coach, referee, scorekeeper, journalist), and end-of-season reflection (Ginciene & Matthiesen,

2017). Within this framework, students learn to play and live in a mini-community that requires them to work together, take responsibility, respect their opponents, and express emotions healthily. This model naturally encourages intense and meaningful social interactions among students, key components of affective development.

When combined with *differentiated learning*, the Sport Education Model's effectiveness in shaping affective aspects becomes increasingly optimal (Luna et al., 2020). Differentiated learning allows teachers to tailor the content, process, and learning products according to each student's needs, interests, learning readiness, and learning style.

In an affective context, every student has the space to participate and feel valued, regardless of their abilities. Students who excel socially can be given roles as captains or coaches, while those who tend to be passive can be guided through supporting roles such as scorekeeper or game observer. This provides a positive emotional experience, increases self-confidence, and fosters a sense of belonging to the team and their activities (Evangelio Caballero et al., 2018).

The study results showed that after participating in SEM-based differentiated learning, students significantly improved affective indicators such as self-confidence, sense of responsibility, teamwork, and sportsmanship. Students were more active in providing moral support to teammates, demonstrating positive attitudes toward opponents, and were able to accept match results without displaying negative attitudes such as anger or excessive disappointment. Furthermore, the classroom atmosphere became more conducive, inclusive, and collaborative, indicators of successful affective learning.

This improvement aligns with previous research conducted by Hastie & Casey (2014), which emphasized that the Sport Education Model can consistently increase students' intrinsic motivation and create a social

climate that supports the formation of moral values in physical education. Learning that involves a well-planned structure of competition and cooperation will trigger students' emotional engagement more intensely and meaningfully.

On the other hand, the success of developing the affective aspect also depends on the teacher's role as a facilitator who can manage group dynamics, understand students' emotional needs, and create a psychologically safe learning environment. Teachers act not only as technical instructors but also as emotional and social guides. In implementing this model, teachers must be sensitive to individual differences, able to identify students who require a specialized approach, and provide positive feedback that can motivate and reinforce desired social values.

In conclusion, the application of differentiated learning through *the Sport Education Model (SEM)* in the *Invasion Game* has proven effective in improving students' technical skills and tactical understanding and significantly enhancing the affective development of elementary school students. Learning designed with individual needs in mind and emphasizing authentic social experiences can shape students' character and support physical education's holistic and humanistic goals.

CONCLUSION

Differentiated learning model through *the Sport Education Model* based on the *invasion game* has been proven to be more effective than conventional learning approaches in increasing active involvement and motivation of students in learning PJOK subjects at the elementary school level.

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