



Integrative Learning Model in Pediatric and Sorches on Athletics Materials with Science Education Biology Materials for Junior High School Students

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Abstract: This research aims to produce an integrative learning model for junior high school students that is suitable for use. The integrative learning model is expected to be used by physical education teachers in teaching and learning activities. This development research was carried out by adapting the following research steps: data collection, analysis of the information collected, development of initial product draft, expert validation and revision, small-scale trials and revisions, large-scale field trials and revisions, and final product creation. A small-scale trial was carried out on 25 students of SMP Negeri 1 Samarinda. Large-scale trials were carried out on 31 students of SMP Negeri 2 Samarinda, SMP Negeri 3 Samarinda, and SMP Negeri 4 Samarinda. Data collection instruments are interview guides, field notes, validation value scales, teacher participation, student responses, performance tests and knowledge tests. Data analysis uses qualitative and quantitative descriptive analysis. The results of this research are in the form of a guidebook containing syntax (steps), assessment forms, 6 integrative games, and plans for implementing appropriate and effective learning.

Keywords: Integrative model of physical education; Junior high school

Introduction

Indonesia has abundant natural resources and has great potential to become a developed and dignified nation. Education is one of the most important factors that cannot be separated for the progress of the nation. This is in accordance with Law no. 20 of 2003 concerning the national education system in article 3 which states that national education has the function of developing abilities and forming dignified national character and civilization in order to educate the nation's life.

National education has the aim of not only producing intelligent human resources but being able to form personalities who have character, morals, creativity, have a vision and mission and are responsible as good citizens. However, based on the current

developments in Science and Technology (IPTEK), it has an impact on the world of education, especially for students. The technological advances achieved today actually confine children to a sedentary environment. Children are increasingly engrossed in their pleasures such as: watching TV or playing video games. It is not surprising that there is concern that children's fitness is decreasing and exposing themselves to a greater risk of degenerative diseases (decreased organ function).

Philosophically, physical education is an inseparable part of the overall education program. This is in accordance with Republic of Indonesia Law no. 3 of 2005 concerning the national sports system states that physical education and sports are carried out as part of a regular and sustainable educational process to acquire knowledge, personality, skills, health and physical

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fitness. Rosdiani (2012) states that, in fact, physical education is a very broad field of study. The point of concern is improving human movement. More specifically, physical education is concerned with the relationship between human movement and other areas of education (Anagun, 2018; Chen & Chou, 2015; Cirillo, 2014; Hamouda & Tarlochan, 2015; Haws et al., 2014; Sandilos et al., 2017; Shoo & Songorwa, 2013; Spiro et al., 2012; Steinhorst & Klöckner, 2017; Tsalas et al., 2017; Yeow et al., 2014). The relationship between the development of the physical body and the mind and soul. This is in line with the goals and functions of physical education which include cognitive, affective, psychomotor, emotional and social aspects. However, in reality, Physical Education learning is still considered an intermediary subject at school.

Learning in schools has a set or system of plans and arrangements regarding learning content and materials that are guided in teaching and learning activities which is called the curriculum. The curriculum aims to achieve educational goals, basically the main component curriculum and supporting components are interrelated and interact with each other in order to achieve these goals (Amador & Carter, 2018; Berland et al., 2016; Chalkiadaki, 2018; Chen & Chou, 2015; Hamouda & Tarlochan, 2015; Robelia & Murphy, 2012; Samoot et al., 2015; Spiro et al., 2012; Teimourdash & Moghaddam, 2017). This goal can be achieved one way by using integrated curriculum development.

According to Garanhani et al. (2013), integrated curriculum development is presented in 4 topics: principles; curriculum structure; the roles of professors and students; and college management. Reflections on the themes presented, allow us to think through the perspectives of those who teach and those who learn in problem solving and meaningful ways, where in learning there are various learning models, each of which has different goals and objectives, so a teacher must be able to adapt model used in learning. The model is designed to be used in the entire learning unit, including all planning, design, implementation and assessment functions for that unit (Fauziyah & Jailani, 2014; Fitriati et al., 2021; Maiyena & Imamora, 2020; Suyatna et al., 2019). More than one type of learning method, teaching style, or learning strategy can be used in one learning model.

In initial observations, researchers saw that there were schools that only had one basketball court which was used as a place for the Physical Education learning process, and there were even schools that did not have a field for carrying out Physical Education learning. This can be seen when the physical education teacher takes students to the stadium to carry out physical education lessons because the school does not have a large enough space to carry out the learning. During the observation,

the researcher also conducted interviews with physical education teachers by asking several questions related to the process of implementing physical education learning at school. After the interview, there was a statement that, "Integrative learning model, teachers need to explain to students that sports learning can be linked to other learning (DM)". Teachers feel the need to organize learning that can help students understand and remember learning in a fun way. Researchers conducted observations at SMPN 1 Samarinda, SMPN 2 Samarinda, SMP N 3 Samarinda, SMPN 4 Samarinda, SMPN 5 Samarinda, during April-May 2023. The results of the observations were deepened by interviews with physical education teachers at each junior high school. During the physical education lesson, the teacher takes the students to a field to warm up. After all students have finished warming up, the teacher explains and exemplifies the lessons learned. After the teacher gives an example, the students immediately practice in the form of playing which is carried out during the physical education learning hours. Based on the results of observations and interviews, it can be seen that the five junior high schools implemented Physical Education with a compartmentalized learning process and were still taught using repetitive techniques.

Researchers also conducted short interviews with students regarding the subjects students studied at school. Some students complain that there are many subjects that students consider difficult to understand, such as Mathematics which is related to numbers and unique formulas which make students often confused, learning English to understand the language of foreign countries, studying complicated social studies, and learning science education which includes Physics, Chemistry and Biology material which requires students to memorize the Latin names of plants and understand various kinds of human and animal body organs which makes students feel bored with this learning. Students also mentioned that in sports lessons at school they studied volleyball, football, basketball and badminton every time sports took place.

After the interview, there was a statement that teachers felt the need to organize learning that could help students understand and remember learning in a fun way and teachers needed new learning models. to increase student motivation in learning. Based on this, the researcher tried to create a learning model where this learning model was used by teachers as a guide in implementing learning at school. This is reinforced by the research of Munendra & Lumintuarso (2015), the results of which stated that the javelin throwing learning model that was prepared was very good and effective, so it was suitable for use for teaching javelin throwing to junior high school students.

Based on the results of this research, researchers created a learning model for athletic material that was integrated with biological material. Athletics material is one of the Physical Education in an effort to improve motor skills, for example strength, endurance, speed, flexibility, coordination, and so on. The characteristics and structure of athletic movement patterns basically boil down to three main things, namely: running including walking, jumping, and throwing. The athletic material is the main subject matter that must be taught to students, as well as a guide for physical education teachers in developing learning programs.

Meanwhile, biology material is a subject that is included in the natural sciences (science or science) family. Science is related to a systematic way of finding out (inquiry) about nature, so that learning is not only mastery of a collection of knowledge in the form of facts, concepts or principles, but is also a process of discovery. Biology learning in secondary schools is expected to be a vehicle for students to learn about themselves and the natural world around them, as well as further prospects in everyday life. Biology subjects are developed through analytical, inductive and deductive thinking skills to solve problems related to events surrounding nature. In accordance with the objectives of biology subjects in the national curriculum (Puskur, 2006), the national character that is expected to emerge through biology learning includes the ability to think analytically, inductively and deductively.

This learning model is an integrative learning model, which is essentially a learning approach that allows students, both individually and in groups, to actively seek, explore and discover concepts and principles holistically and authentically (Depdikbud, 1996 in Trianto, 2014). According to Rahyubi (2012) the learning model should have five basic elements, namely: syntax, namely the operational steps of learning; social system, namely the atmosphere and norms that apply in learning; principles of reaction, which describes how teachers should view, treat and respond to students; support system, namely all facilities, materials, tools, or learning environments that support learning; instructional and nurturant effects, namely learning outcomes obtained directly based on the targeted objectives (instructional effect) and learning results outside of the target (nurturant effect).

In this research, what is meant by an integrative learning model is a learning model that combines subjects, namely physical education learning with science education learning, on the subject of athletics material with biology material which combines two discussion topics, namely; Middle distance running uses the human circulatory system, shot put uses the human motion system and long jump uses the human respiratory system.

The product specification expected from this research is in the form of a guidebook for an integrative learning model for physical education subjects that is integrated with science education subjects for junior high school students. The material developed in the integrative model is athletic material integrated with biological material. The learning developed in this research contains various physical education materials that are adapted to existing competency standards (SK) and basic competencies (KD).

The learning model developed is a medium for transferring material contained in the curriculum. Model goals Physical education integrative learning is given to junior high school students based on the consideration that junior high school age students are at the puberty development stage, namely 12-15 years old in the adolescent category.

Adolescence comes from the Latin word adolescence which means developing towards maturity. In accordance with the opinion of Turner & Helms in Veronica & Nisfiannoor (2006) adolescence means the stage of life that takes place between childhood and adulthood. The development stage of junior high school students is at a very rapid development period in all aspects, namely, aspects of cognitive, affective and psychomotor development. In the development of cognitive aspects, the period starting around the age of 11 or 12 years to 14 or 15 years, which is approximately the same as the age of junior high school students, is the developmental stage of the period of formal operations (Piaget in Hergenhahn & Matthewh, 2008).

The behavior caused by this transition period gives rise to various situations where students are unstable in controlling their emotions. Curiosity about new things that have never been encountered before results in the emergence of behaviors that begin to emerge as personal character (Daubenmire et al., 2017; Wong et al., 2021; Yusop & Sumari, 2013). This curiosity must be directed towards positive behavior to gain learning experiences that support the development of behavior, personality and knowledge.

The opinions of these experts can also be a reference that at junior high school age it is very important to develop dexterity and skills in sports and academics. Physical education is the right target for developing various skills. The aim of the integrative learning model is an innovation that can be developed by teachers in schools as an effort to achieve the goals of education. Integrated Physical Education learning is an effort to align Physical Education with other learning.

Method

Types of Research

Research and development methods or in English Research and Development are research methods used to produce certain products, and testing product effectiveness (Sugiyono, 2010). Based on the explanation of Borg & Gall (1983) that research and development use research findings to design new procedures and products, then systematically tested in the field, evaluated, and refined until they meet certain criteria for elements of effectiveness, quality or standards. the same one.

Time and Place of Research

Implementation of small-scale trials took place at SMPN 1 Samarinda in August 2023, and implementation of large-scale trials at three junior high schools, namely SMP Negeri 2 Samarinda, SMP Negeri 3 Samarinda and SMP Negeri 4 Samarinda which was carried out in September 2023. Effectiveness test of the product was implemented at SMP Negeri 1 Samarinda.

Research Subject

The test subjects in this development research were junior high school students, the small-scale trial took place at SMPN 1 Samarinda using 25 students as subjects and the large scale trial was carried out in three junior high schools, namely SMP Negeri 2 Samarinda, SMP Negeri 3 Samarinda. and SMP Negeri 4 Samarinda with 26 students.

Research and Development Procedures

According to Borg & Gall (1983) the research and development model has ten steps in implementing research, these steps include: preliminary study and data collection (literature review, field observations, creating a research framework); planning (research objectives, funds, time, research procedures, various forms of participation; developing the initial product (planning the initial draft of the product); initial testing (trying out the draft product in limited areas and subjects); revisions to prepare the main product; main field trials (trials in wider areas and subjects); revisions to prepare operational products; operational product trials (product effective tests); revision of the final product (effective product revision); and dissemination and implementation of the product development (the aim is that the newly developed product can be widely used by sports players and the public). Based on this opinion, in this research, the development procedures were simplified according to the constraints and conditions in the research. The steps taken in this research and development are as follows.

Preliminary Studies

Based on the preliminary study, the assumption was found that physical education teachers feel the need to organize learning that can help students understand and remember learning in a fun way so that students do not feel bored when carrying out physical education learning. Apart from that, teachers need new learning models to increase student motivation in learning.

The preliminary study was carried out through observations and interviews with five physical education teachers in five state junior high schools in the city of Samarinda. In addition, the researcher conducted a literature study to study SK (competency standards) and KD (basic competencies) for both class VII middle school subjects, relevant research results, and theories related to integrative learning for middle school students. Information from observations, interviews and literature studies was then analyzed to focus on the aspects that form the basis of the integrative physical education learning model for junior high school students. Development is focused on physical education activities which are integrated according to the characteristics of junior high school students.

Initial Draft Development

This research and development aim to produce a product in the form of an integrative learning model for junior high school students which is compiled in a guidebook entitled Integrative Physical Education Learning Model. This guidebook was prepared to make it easier for Physical Education teachers to understand the implementation of models and applications in the Learning Implementation Plan (RPP).

Initial Draft Validation

After the preparation of the test items is complete, it continues with the assessment of material experts, namely physical education experts and biology experts. In the validation process, material experts assess and provide input on the initial product. Based on this, revisions were made to the initial product. This revision process continues carried out until the initial product reaches a certain predetermined limit value, which indicates that the initial product is good/valid and worthy of being tested.

Small Scale Field Test

Small-scale field tests were carried out by students at SMPN 1 Samarinda and documented in the form of a Digital Versatile Disc (DVD). This DVD contains the implementation of Physical Education learning on athletic material which is then observed by experts and teachers and followed up with a product revision process. Product revisions are carried out from the results of small-scale trials, by analyzing deficiencies

found in small-scale trials, input received from experts is followed up by carrying out product revisions. It is hoped that the revision of the results of small-scale trials will be an addition to facing large-scale trials.

Large Scale Field Tests

Large-scale field tests by students at three junior high schools, namely SMP Negeri 2 Samarinda, SMP Negeri 3 Samarinda and SMP Negeri 4 Samarinda, and documented on DVD. This DVD contains the implementation of Physical Education learning and athletic material which is then observed by experts and followed up with a product revision process. The process carried out at the large-scale field test stage is similar to the process carried out at the small-scale field test stage. The difference lies in the larger number of large-scale field test subjects than in small-scale field tests.

Final Revision

The product revision process is carried out to obtain input from material experts to produce the final product. At this stage, a product has been obtained in the form of a guidebook for developing an integrative physical education learning model for junior high school students.

Final Product Creation

After going through various revision processes, the results of the development were then compiled after carrying out small-scale and large-scale field tests, namely the creation of the final product or final product in the form of a guidebook for an integrative learning model for physical education and athletic material with science education. Biology material for junior high school students. This final product will be used later.

Trial Design

Product trials were carried out twice, consisting of small-scale trials and large-scale trials. The teacher plays the role of implementing the learning process according to the draft model. The trials that have been carried out are observed by observers, namely physical education teachers, to determine the feasibility of the integrative learning model. After carrying out the feasibility test, the product effectiveness test is then carried out.

Subject Try

The test subjects in this research were junior high school students. Researchers chose three junior high schools in the city of Yogyakarta based on the lowest to highest school ranking, namely: three junior high schools, namely SMP Negeri 2 Samarinda, SMP Negeri 3 Samarinda and SMP Negeri 4 Samarinda and the

product effectiveness test was carried out in 1 school, namely, SMP Negeri 1 Yogyakarta.

Implementation of a small-scale trial using as subjects 26 students of SMPN 1 Samarinda class VIII. The large-scale trial subjects used 26 students from class VIII and 24 students from SMP Negeri 2 Samarinda class VIII. The product effectiveness test was carried out at SMP N 3 Samarinda with 32 students in class VIII.

Data Type

There are two types of data collected from this research, namely data: Qualitative data obtained from: the results of interviews with physical education teachers; field notes; and data on suggestions for improvements to the initial model draft, implementation of small- and large-scale trials. Quantitative data was obtained from: validation value scale assessment; teacher participation questionnaire; student response questionnaire; student performance test scores; knowledge test scores.

Data Collection Instrument

Interview

Interview guidelines are used as data collection if the researcher wants to conduct a preliminary study to find problems that must be researched (Sugiyono, 2010). The interviews were carried out openly so that the informants knew that research was being conducted and the informants were being conducted become a source of information. The questions prepared in the interview guide are adapted to the purpose of conducting the interview, namely that this interview contains information about the implementation of the physical education learning process and the learning model used by the teacher.

Value Scale Questionnaire

The value scale questionnaire instrument is used to assess the feasibility of the learning model developed before carrying out small-scale trials. After the material experts assess that the learning model is in accordance with the elements in the value scale, the new model can be tested in small-scale trials. The value scale questionnaire is intended to obtain assessment/validation from experts and practitioners regarding the preparation of the draft model which was developed in terms of material content, language and writing format.

Data Analysis Technique

The data analysis technique used in this research is quantitative and qualitative descriptive data analysis. Quantitative descriptive data analysis techniques were carried out on: the results of the validation assessment using the material expert's rating scale on the draft

learning model before the trial; validation assessment data using the material expert rating scale; assessment data from the validation of teacher participation questionnaires; and student response questionnaire. The range of scores on the validation questionnaire, assessment of learning model lesson plan results, teacher participation questionnaire, model implementation observation guidelines and student response questionnaire are: score 1 for inappropriate assessment, score 2 for inappropriate assessment, score 3 for appropriate assessment, score 4 for very appropriate assessment (Mardapi, 2012). The model prepared is considered suitable for testing on a small or large scale if the quantitatively calculated score reaches the minimum standard of feasibility. The categorization norms used are in accordance with the provisions of Saifuddin (2008).

Table 1. Categorization Norms

Score Intervals	Category
3.26 to 4.00	Good
2.57 to 3.25	Pretty good
1.76 to 2.50	Not good
1.00 to 1.75	Not good

Results and Discussion

After receiving assessments and input from both experts and physical education teachers who tested the model, revision processes were carried out on the draft learning model so that finally a manual for the integrative learning model for physical education, physical education, athletic material with science education learning, biology material was produced, which was equipped with the form of an integrated RPP.

Before the product is tested, validation of the initial draft is carried out by material experts. Detailed results of the material expert assessment can be seen in Table 2.

Table 2. Material Expert Assessment Results

Score Intervals	F	Category	F	Percentage (%)
3.26 to 4.00	1	Good	1	100
2.57 to 3.25	0	Pretty good	0	0
1.76 to 2.50	0	Not good	0	0
1.00 to 1.75	0	Not good	0	0

Based on Table 2, it shows that the material expert's assessment of the suitability of the integrative physical education learning model material for athletic material with science education learning for biology material for junior high school students is 100% in the good category with an average value: 33.0. The total score for each expert is in the interval 3.26 to 4.00 which means it is in

the good category. These calculations are the basis that the initial product draft of the Physical Education integrative learning model for junior high school students is suitable for small-scale trials.

After the learning model was produced, the next step was to test its effectiveness experimentally using knowledge test questions for biology material in science education learning and performance tests to assess the results of the effectiveness of athletic material in physical education. The test is in the form of questions related to the material that has been integrated, as in this study integrating physical education learning about athletic material with science education learning about biology material, so that the knowledge test questions are related to physical education and biology.

In testing the effectiveness of the product, the author used 32 students of SMP N 1 Samarinda class VIIIb as the control class and class VIIIId with 32 students as the experimental class. This effectiveness test was carried out in two meetings. Pretest and posttest results of product effectiveness tests such as shown in Table 2 the pretest score in class VIIIb for biology material as a control class with an average of 72.1. The posttest score was 76.8.

In class VIIIId in the experimental class, when the initial test was carried out, the pretest score was obtained with an average score of 77.6 and the average posttest score obtained by students was 87.6. While the average pretest score for physical education material for the control class was 79.4, the experimental class 80.6. Meanwhile, the average Posttest score for the control class was 79.03 and the experimental class was 87.6. Then, after learning was carried out using the integrative learning model for physical education and biology, this meant that there was an improvement.

Based on the results of the pretest and posttest, it was then continued with statistical tests to see whether there was an increase in the effectiveness and influence of physical education learning using the integrative learning model for physical education on athletic material and science education on biological material using the paired t test. Before carrying out statistical analysis tests, prerequisite tests are carried out, namely normality and homogeneity tests.

After the data is declared normal and homogeneous, an influence test is sought. The influence test in this research was carried out to see the influence of the physical education integrative learning model and science education learning outcomes on the control class and experimental class, as in the Table 3.

Based on Table 3, it is known that the t-test results for Physical Education learning in the control class were -3.655 with a sig value of .001 and the t-test results for science education learning in the control class were 2.243 with a sig value of 0.029 < 0.05 so it can be concluded

that there are influence. This also happened in the Physical Education learning experimental class -10.117 with a sig. of 0.232 and it is known that the t test value for the experimental class science education learning was 4.950 with a sig value of $0.000 < 0.05$ so it can be concluded that there is an influence of the model. Testing the effectiveness of the product in this research used the t test with the help of SPSS 20. From the experimental class pretest and posttest data with the Paired t test, the pretest and posttest data were obtained as in Table 4.

Table 3. Calculation Results of the Influence Test for Control Class and Experimental Class

Physical Education Effect Test Results		
Class	t-count	Sig.
Control	-3.655	.001
Experiment	-10.117	.232
Biological Influence Test Results		
Class	t-count	Sig.
Control	2.243	.029
Experiment	4.950	.000

Table 4. Results of the t test on the effectiveness of Physical Education and Science Education learning products

Test type	Learning	t-count	Sig.
Effectiveness test	Physical education	2.103	.040
Effectiveness test	Science education	5.378	.000

Based on Table 4, it is known that the Physical Education learning t-test value is 2.103 with a significance of .040 and for the test value t of science education learning is 5,378 with a significance value of 0.000, so it can be concluded that the integrative physical education learning model is effective to use.

The practical guidebook for the integrative learning model for Physical Education consists of; CHAPTER I: introduction (background & objectives), CHAPTER II: concept of the integrative learning model, the relationship between Physical Education and science education, biological material, implementation of the integrative learning model, time and place for implementing the Physical Education integrative learning model, syntax (steps), assessment of learning outcomes, CHAPTER III: closing, and equipped with integrated learning materials, physical activities integrated with biology consisting of six games, namely: micro circles, cholumbiformes, taxonomy variation, happy jump, vois jet, measles galeh which is applied in the form of lesson plans.

Conclusions

Developing an integrative learning model for physical education on athletic material with science education learning on biology material for junior high school students, there are three things that can be concluded from the resulting product, namely: Based on the research and development objectives which were carried out directly by adopting Borg and Gall's development steps into 7 development steps. Physical education learning model for athletic material with science education learning biology material in the form of a practical guidebook integrating two learning materials that are suitable for use. The practical guidebook for the Physical Education integrative learning model consists of; introduction (background & objectives), explanation of the relationship between Physical Education and science education, implementation of the integrative learning model, time and place for implementing the integrative physical education learning model, syntax (steps), assessment of learning outcomes, closing, as well as integrated learning materials, activities physicality integrated with biology consisting of six games, namely: micro circles, cholumbiformes, taxonomy of variations, happy jump, vois jet, measles galeh and there is a form of integrated RPP. Each stage of the game activity is related to one another in physical education learning and science education learning. The product of this development research is a practical guidebook for physical education learning for junior high school students entitled Integrative Learning Model for Physical Education and Physical Education Materials for Athletics with Science Education Learning Biology Material for Junior High School Students. Suggestions for the use of products resulting from the development of learning models that can be used in physical education learning for junior high school students. Game model products are intended for teachers as users of learning models.

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Authors Contributions

Conceptualizing research, E., and M.; designing, E., M.R., and A.S; collecting Data, E.; analyzing data, E. and M.; writing – original draft preparation, E.; writing – review and editing, M., M.R., and A.S.

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Conflicts of Interest

All authors declare that there is no conflict of interest.

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