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Implementation of Philosophy of Idealism according to Pestalozzi in Elementary School Mathematics Learning

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Abstract: The principles of the philosophy of idealism contain aspects, including macro and micro aspects of metaphysics. Apart from that, there is an idealist axiological aspect, namely that values are eternal and universal. In education, it manifests itself as a curriculum, namely a hierarchy whose peak is occupied by scientific disciplines. Pestalozzi as an idealist has an integrative concept of education which consists of 3 aspects: physical, intellectual and moral. The type of research in this article uses descriptive qualitative methods in an interpretive manner, using the philosophical theory of idealism and the Pestalozzi principles. Then combined with analyzing the practice of learning mathematics that has been done. This article explains the implementation and examples of how these 3 aspects of education can be implemented in mathematics learning with various forms of activities.

Keywords: Idealist philosophy, Pestalozzi, physical aspects, intellectual aspects, moral aspects, learning mathematics

INTRODUCTION

Mathematics learning continues to experience rapid development. (Alhaddad, 2016). Starting from learning theories, strategy development, methods and production of teaching aids are increasingly diverse. However, this is not yet in line with implementation at the reality level, especially for elementary school and madrasah ibtidaiyah students. There are still many problems that occur in madrasah mathematics learning and among students. (As'ari, 2013; (Nuraeni et al., 2020) There are still various problems related to the learning process, teacher quality and professionalism, how teachers provide evaluations and so on.

Facing various learning problems, it can be helped to find solutions by deepening philosophy. After studying educational philosophy, many ideas and inspiration emerged regarding how to implement it in learning, especially mathematics learning. Mathematics as an exact subject has special characteristics that not all students like. For this reason, appropriate, innovative, creative treatment is needed in learning mathematics. (Siregar et al., 2017; Darma et al., 2020)

Pestalozzi as someone who leans towards the philosophy of idealism, his principles are very inspiring to perfect the process of learning mathematics, which is usually only presented as ansich content, so it needs to be corrected following the principle of the unity of the three Pestalozzi aspects: intellectual, moral and physical. (Adelman, 2017; Mueller, 1947) In this article, it will be explained how learning mathematics is carried out by paying attention to the philosophy of idealism according to the principles of Pestalozzi.

1. Philoshopy Idealism

Various philosophical currents have their respective implications in learning. So is the idealistic philosophy. (Yanuarti, 2016); Rusdi, 2013). To understand its implications for

mathematical learning, it is necessary first to understand the principles of idealism's philosophy as well as those followed by its so-called idealists.

2. Metaphysical Idealism

Metaphysics is one of the branches of philosophy that studies and understands the causes of everything so that something becomes existent. (Van Inwagen, 2018; Loux & Crisp, 2017). According to Aristotle, there are two objects of metaphysics: (1) there is as there is (absorbed by the senses); (2) there is a divine which cannot be absorbed by senses. (Afifi, 2022; Dewi, 2021; Sanprayogi & Chaer, 2017)

The two metaphysical objects have a distinctive relationship. The relationship is between the small part to the whole. The principle of the relationship between the spiritual self and the other leads to the concepts of the Macrocosm and the Microcosm. (Thohir et al., 2017). The soul of the macrocosm is the whole existence and foundation of all beings, that people constantly think, feel, understand, and desire. The microkosmos is a finite part of the whole, individual. The basic metaphysical problem of the idealists is the question of the relationship of the part of the whole, the microcosm with the macrocosm (Jantsch, 2021; Mohamed, 2001) These two aspects are the study of the idealists.

3. Epistemological Idealism

How do those idealistic philosophers/idealists characterize the way they think? This section will provide the explanation. According to idealists, sincerity and steadfastness in behavior is a set of close, orderly, and systematic relationships. To "be" someone or something, or to be there, then one must systematically engage in the whole-microcosm or macrocosm relationship. (Gabriel, 2016).

According to the principle of epistemological idealism, the primary task of education is to help the learner develop a more primary and complete identification with a thorough mind. Learning is self-expansion, both qualitatively and quantitatively, achieved by self-development. Students seek understanding and broad general perspectives on their surroundings. (Rockmore, 2018).

4. Idealistic Axiology

In idealistic axiology, values have a position that is more than just human choice. Value is a real truth that is essentially inherent in the structure of the universe (Mubin, 2019). The experience of fundamental value is an imitation of the good that appears in everyday deeds. As the real truth, the value is absolute, eternal, fixed, and comprehensive (Hanifah & Fauziati, 2021). Goodness, truth, and beauty are in the structure of the universe. What is said to be good, true, and beautiful fundamentally does not change from generation to generation. (Festenstein, 2015). Man does not create value, but value itself is part of the universe.

5. Curriculum according to the Idealist

The idealists view the curriculum as a framework of subjects that are ideological and conceptual. This varied system of concepts explains and is based on certain manifestations of truth. (Momany & Khasawneh, 2014). It means that the conceptual system culminates in the merger and integration of concepts, the unification of ideas, or the unity of meanings.

The curriculum in idealism is a hierarchy whose culmination is occupied by the general disciplines of philosophy and theology, which explain the general and basic relationship of man to God and the universe (Mubin, 2019).

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Mathematics is a very useful discipline because it provides methods that connect with abstraction. (Bassarear & Moss, 2015); (Ibrokhimovich, 2022). Experience must be more than teaching a textbook, so knowledge and experience are always relevant. (Wake, 2014)

6. The Relation Between the Students and the Educators

According to the idealists, in the relationship of the educator with the student, the primary attention lies on the important and crucial rules for the educators. The philosophers of idealism have high expectations of teachers. Excellence must be found in teachers, both morally and intellectually. There is no element more important in the school system than the teacher.

J. Donald Butler, in his book Idealism in Education, emphasized the important rules for educators by mentioning the expected qualities in a good educator. (Suripto, 2012;Miller, 2012) These criteria include: (1) personifying oneself as a cultural and reality in the student; (2) being an expert in personality to recognize the students; (3) being an expert in the learning process; (4) calculating the relationship with the student; (5) developing the interest of the student in learning (6) realizing the moral of the Good; and (7) helping the cultural birth process of each generation.

7. PRINCIPLES OF EDUCATION IN PESTALOZZI

Pestalozzi was an educator on the side of the poor. The man who began his ministry as a priest and lawyer finally focused his attention on the world of education. This Zurich-born man of 1746 had the principle that education should include physical, intellectual and moral. (Boiliu & Samosir, 2019)

a. Intellectual Education

Intellectual education is intended to exploit the potential that exists within the child so that he or she can understand the realities that exist. With learning incentives involving physical, intellectual, and motor activities, the child's potential is expected to develop optimally (Nuryati, 2017)

b. Moral Education

The moral education of a child is heavily influenced by the model, example, and environment of the child's nearest environment.(Boiliu & Samosir, 2019). Parents and teachers are at the center of a child's moral example. Based on the practical experience of the child, the child will be able to develop the ability to make decisions independently, cooperate with others, and encourage the interests and goals of children in building reasoning. ((Kusumawati & Zuchdi, 2019)

c. Physical Education

Pestalozzi strongly recommends that children have free movement. These simple movements form the basis of all physical movements, and it is the parental duty to develop the physical movements of these children. Through their parents, they not only developed their physique but also studied and paid attention to the outside world and tested relationships with the surrounding environment. Home and school need to facilitate children's movement to be free of expression. This is because the development of children's motorbikes will be optimal if the child can move freely indoors and outdoors, both while studying and playing. (Agustin et al., 2021)

According to Pestalozzi, the three aspects of education—moral, physical, and intellectual—are a holistic unit that cannot be left one to the other. Therefore, learning needs to be designed in earnest to improve and train students' physical, motor, and cognitive skills. (Utami et al., 2018)

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d. The Best Way to Learn

Pestalozzi holds the principle that all forms of education are based on the influence of the senses, including hearing, seeing, tasting, and touching. By learning through experiences gained in learning, the potential of an individual can be developed. Pestalozzi believes that the best way to learn various concepts is through various experiences, including calculating, measuring, feeling, and touching. His view of educational goals is to encourage children to be good people by developing all their abilities.

He saw that all efforts made by adults should be tailored to the child's development because education, by its nature, is an effort to provide help so that the child can help himself later. Pestalozzi's view of children can be concluded that children should be active in helping or educating themselves (Boiliu & Samosir, 2019). In addition, since child development takes place regularly, progressing step by step, the implication or effect is that learning must also progress regularly, step by step.

e. The Parents and Teachers

Pestalozzi viewed parents as teachers and the teachers as parents who followed Burgdoft's description: the home was a place to achieve its purpose to be the first place of education rather than anywhere else. The common learning of happiness, child loyalty, trust, shelter is at home. That's what a teacher does, just like a mother does.

METHOD

This type of research in this article uses interpretatively qualitative descriptive methods (Elliott & Timulak, 2021), using the philosophical theory of idealism and Pestalozzi principles. It is then combined by analyzing the mathematical learning practices that have been carried out. Data collection techniques use interviews, documentation, and library research instruments. Data analysis is done directly by describing it using the analytical side of idealism. Confirmation and practice data are described in a descriptive discussion. The learning practice was conducted with 25 elementary/MI student participants in Sewon district, Bantul Regency. Students consist of 2nd to 5th graders. The practice of learning uses various activities and practices and forms Math Adventure activities. Based on all the mathematical learning activities that have been conducted, which category of learning focuses on the physical, intellectual, and moral components.

RESULT AND DISCUSSION

The mathematical learning that has been carried out is the learning of repetitive aggregation material, measurement geometry, volume, and speed. Math Adventure to Adisutjipto Airport, also math adventure to Jakarta by plane and train. Based on the activities, descriptions of mathematical learning activities and tools, and materials used, the physical, intellectual, and moral aspects of learning mathematics can be analyzed for this SD/MI.

1. Pestalozzi Idealism in learning Mathematics

Pestalozzi had the principle that education should be carried out in three aspects: intellectually, physically, and morally. Mathematical learning for SD/MI (elementary school) students will have a positive impact when it involves attitudes, knowledge, and morality. In those three aspects, philosophy and practice meet. In this article, examples of practical mathematical learning of various concepts and materials will be outlined, which are the implementation of aspects of the idealism philosophy of Pestalozzi.

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2. Learning Repeated Multiplication

Figure 1. Tools and materials

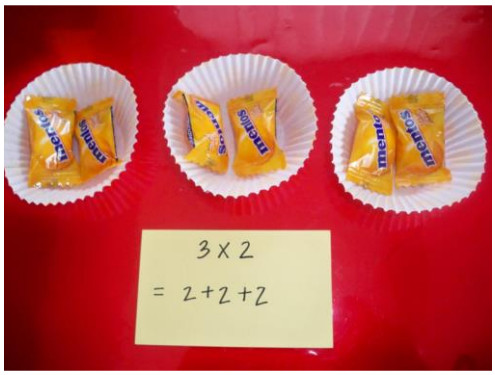

Figure 2 Multiplication tools 3x2 as for repeated addition

Repeated multiplication learning using candy, cereal, and so on encourages students to construct their own understanding, thus acquiring concepts that are easier to understand. This learning forms the basis for the material preconditions of multiplication. A multiplication of 3x2 is defined as the number of objects in three containers, each containing two pieces. That means: 3x2 = 2+2+2. (Handayani, 2021). Of the three important aspects of education, according to Pestalozzi, there are two that come into play in this learning activity. Repeated cumulative learning is more susceptible to physical and intellectual education. If you use the terms of language or terminology available in the 2013 curriculum, it can be stated that such repetitive multiplication learning serves the cognitive and psychomotor aspects.

3. Learning Geometry

Learning about geometry and measurement is done through various activities. Students perform measurements of the length, width, area, and perimeter of real objects. Measuring objects include books, classrooms, the height and length of the fence, and so on. In addition, students also create nets of various kinds of 3D shapes. In this learning activity, students can cultivate their physical, moral, and intellectual aspects (Sudarwan & Retnawati, 2015). Its moral aspects include a teamwork attitude, a meticulous attitude in measuring, and a consistent and honest attitude in conveying existing measurement data.

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Figure 3 Making nets of 3D shapes

Figure 4. Measuring fence's length

Based on the documentation of such learning activities, students do learn by doing, with activation, so that students do not experience boredom, and physical growth can be developed. Besides, students' cognitive intellectual processes

4. Learning volume and speed

Mathematical learning about volume and speed is done with a variety of activities. To find out the volume of water, the students rooted with a variety of containers, glasses of different shapes that read the volume across the measuring glass. Because the location practice is in the village's kindergarten complex, there is a simple swimming pool facility that students can use while studying volume. By measuring the height or depth of the water, the width and length of a pool, then students can determine the volume of the pool water. To determine the speed, distance and travel time, students perform various activities such as running, walking and cycling. Through these activities, students can move actively, learn happily, so that both physical and intellectual aspects can be optimally painted. This kind of contextual learning can enhance the understanding of the student, as well as broaden the knowledge treasury of the learner(Rohmah et al., 2022)

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Figure 5. cycling, counting the distance and the duration

The following will be described on the mathematics learning activity with a series of adventure activities. The adventure activities include exploration to Adisutjipto airport, as well as adventure to Jakarta by plane.

5. Learning Math Adventure to Adisutjipto Airport

In learning mathematics at Adisutjipto airport, this teaches physical, intellectual as well as moral aspects. The explanation is as follows:

a. At the time of study, all students carry out the movement activity freely. Of course this involves physical education, where they move up and down the shuttle bus to the airport, walk towards the airplane's arrival viewing room, towards the intelligence officer, then to the currency exchange and the Roti-O counter all using physical activity.

Figure 6 Exchanging money in Money Changer

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Figure 7 Finding information and asking the staff at the airport

b. Besides, the students count the money spent on the Roti-O, the conversion of the currency of the rupee to the riyal, the US dollar, the Singapore dollar and the Malaysian ringgit all involve intellectual activity.
c. Other activities are discussions, division of tasks, coordination, and cooperation among group members. This is an activity on the moral aspect, that is, how students become socially active, reduce the ego for the good of the group, do activities Together with joy and so on.

6. Learning Math through an adventure to Jakarta by plane and train.

Figure 8 Getting off the plane in Jakarta

This learning encourages students to sharpen their cognitive and intellectual skills as well as follow an adventure program. This math adventure is part of a community dedication activity funded by Kemenag 2015, followed by 4 participants from a total of 25 students participating in a free SD/MI mathematics lesson for 20 meetings. The math adventure started in Yogyakarta, traveled to Jakarta by plane, and returned by train. With this learning, the children can feel and experience the speed and time travel of Yogya-Jakarta and Jakarta-Yogya. In learning mathematics, this adventure to Jakarta teaches physical, intellectual, and moral aspects. It can be explained as follows: Of course, taking a long journey requires preparation, both physical and mental. Before determining who of the 25 students will escape the adventure to Jakarta, of course, the committee held a selection first. The selection is a case of problem solving when the student is in a foreign place. With such a case test, we can tell the child's mental maturity and whether it's worth a long trip. In the process of this

adventure program, students also have to work as a team or group, not just as individuals. It teaches that students are also mature in moral aspects, not just physical ones. While on the flight, students are asked to fill out the LKPD about distance, speed, and time. Then, when visiting the Constitutional Court office, there are various rules that must be followed regarding the procedure of the visit.

CONCLUSIONS

Pestalozzi, as an idealist, encourages the three physical, intellectual, and moral aspects of education. On the implementation of mathematical learning in this writing, the writer can give examples of the implementation of three of these aspects. Repeated cumulative learning implements both physical and intellectual aspects. Measurement geometry uses both physical and intellectual aspects. Also, the idealistic philosophy of Pestalozzi can be learned in mathematics. With the recommendations of this research, other research can be developed with different subjects.

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