The impact of self-regulation on motion coordination ability for Elementary School students

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Abstract. This study aims to determine the effect of self-regulation on the ability of motion coordination of elementary school students. Motion experience and physical activity in elementary school children proved to have a positive effect on children's physical, psychological, and social development. In addition, physical education in elementary schools is oriented to laying down the foundations of basic movement and movement, so that in the future, children will grow-up and develop into complete personalities that are in harmony and in harmony with age. Coordination ability is one of the basic components of motion. Self-regulation is internal motivation, which results in the emergence of a person's desire to determine goals in his life, planning strategies to be used, and evaluating and modifying the behaviour that will be carried out. The method used is a quasi-experimental method that examines the effect of self-regulation on coordination ability of elementary school students. The instrument used for data retrieval on the variable of self-regulation is a questionnaire, while the variable of ability to coordinate the motion used the test. The results of this study show that self-regulation contributes to the ability to coordinate motion. Self-regulation of elementary school students has a varied contribution to the components of motion coordination, namely: the ability to assemble movements, distinguish, the ability to maintain balance, the ability to maintain balance, adapt movements, find and maintain the rhythm of movement, react and change direction.

1. Introduction
Physical education as an integral part of education can help students to be able to undergo the process of growth and development optimally, both physical, motoric, mental, and social. The purpose of developing physical aspects will be related to the ability to carry out activities that involve physical strength and various body organs (physical fitness). Motion development is related to the ability to move effectively, efficiently, smoothly, beautifully, and perfectly. Mental development is related to the ability to think and interpret knowledge about physical education into the environment. Social development is related to students' ability to adjust to their groups. Physical education has an important role to increase the level of physical activity for children [1-3]. Rusli Lutan said that physical education is a systematic effort to develop children's personality, such as the development of self-esteem, self-confidence, and tolerance of fellow friends [4].

Many activities are characterized by an atmosphere of freedom to express themselves and play freely to get to know the environment in exciting situations. Even though the direction of teaching, especially physical and health education is also concerned with the development of skills in a sport, but the emphasis is more on developing general and overall mobility. Thus, activities in schools are directed at the introduction of a sport but emphasized on the task of motion.
According to BNNSP, that one of the objectives of implementing physical and health education in primary schools is to improve basic movement ability and skills [5]. Current physical education structures and curricula in primary schools have features that consist of basic technical skills in several sports. The basic technical skills of this sport will be mastered if they previously mastered basic motion skills. Likewise, mastery of basic motion is influenced by the ability to coordinate motion. Coordination is the ability to control body movements and able to move efficiently (physical movement well). Coordination is measured through the pattern of movement of skills which includes the ability to control the body, balance, agility, and flexibility. This is very dependent on students, one of which is self-regulation ability. Therefore, this article suggests that self-regulation has an effect on motion coordination ability. In addition, research contributing to self-regulation on mobility can also provide knowledge of the autonomous learning in elementary school students.

1.1. Self-regulation
Self-regulation is a proactive process where individuals consistently regulate and manage their thoughts, emotions, behaviour, and environment to achieve academic goals [6,7] in Ramdass [8]. Self-regulation operates through three important areas of psychological function in learning, namely the cognitive field (e.g. learning strategies), motivation (e.g. assignment value), and metacognitive (e.g. self-reflection). These three areas of self-regulation operate cyclically where mastery of tasks depends on confidence in one's abilities and expectations of success. According to Zimerman in Ramdass self-regulation is a skill [9]. According to Zimmerman, self-regulation also refers to the degree to which a person can use himself to regulate his behaviour and regulate his environment.

Furthermore, Vande Walle et al. define self-regulation as a cognitive process that plays a role in the form of motivational power into behavior and performance [10]. Ablard and Lipszult in Dachrud, concluded several studies that self-regulation is a strategy that has an influence on one's performance to achieve an achievement or experience self-improvement [11]. Self-regulation, such as time management, goals setting, effort and perseverance in completing difficult tasks, and the performance of monitoring oneself are not only important for academic success but can also be a key component in life.

Self-regulation involves the choice of learners. To do self-regulation, students must have several choices available to them, such as whether they want to participate, what methods are used, what results they will pursue, and what social settings they will work on. The ability of self-regulation includes behavior, because individuals regulate their actions to make them stay focused on achieving goals. Individuals also regulate cognition and influence. When they do learn, they regulate cognition and influence by maintaining self-efficacy for learning, respecting learning, holding expectations on positive results as a result of learning, evaluating the progress of their goals, determining how effective their strategies are and changing them if needed, and maintaining an atmosphere positive emotion [12].

1.2. Motion coordination
One of the physical characteristics of elementary school children who are in the developmental stage is coordination ability. Eye-hand-leg coordination ability will increase with age and occur during childhood [13]. For this reason, the best time to teach coordination skills is at a young age [13], because at a young age, the ability to coordinate, balance and agility increases rapidly [14]. Coordination ability is one of the basic components of motion. For this reason, coordination ability is the goal of taxonomy in physical education in elementary school [15]. Strengthened by Harrow that coordination is part of individual perceptual abilities that must be taught from an early age [16]. The factor of coordination ability as one of the parameters of motor skills in elementary school age children, and is a type of underlying ability in learning various motor skills. Children who have good coordination skills will look flexible, easy, and harmonious in doing any motor skills. However, there are obstacles that the age for learning coordination skills is relatively short, that is, up to the end of childhood, because after going through childhood and starting to learn motion coordination, children will experience many obstacles.
That is, the ability of motion coordination must be taught as early as possible, where early age is generally in formal education in elementary school.

Understanding coordination according to Gallahue, coordination is the ability to integrate various elements of the motor system with sensory feelings into a form of motion that is efficient, fast, and accurate [17]. The motor system element is the ability of individuals to integrate the sensory, nervous, and bone systems to control body parts in one complex motion [18]. Likewise, according to Walter in Kornspan that motor coordination is the driving force (nerves, muscles, bones, and joints) that are related to the right space and time in relation to the occurrence of motion [19]. For that, according to Schmidt, coordination ability is a combination of motion from one or more interrelated joints in producing one motion skill [17].

The quality of one's coordination ability is influenced by the speed of movement and information about the motion that will be carried out. In general, the coordination ability needed is neuromuscular coordination [20]. Neuromuscular coordination is any movement that occurs in the right order and time and its movements have energy. There are two kinds of neuromuscular coordination, namely intramuscular coordination of coordination and intermuscular coordination [21] and [22]. There are seven factors that determine the learning process of coordination ability to form good movement skills, namely the ability (1) to arrange movements, (2) to distinguish targets, (3) to maintain balance, (4) to adapt, (5) to find and maintain movement rhythms, (6) to react, and (7) to change directions.

2. Research methodology
This research is a survey research with correlation techniques, because this study aims to find whether there is a relationship between self-regulation and the ability to coordinate motion in physical education learning for the fourth-grade elementary school students. The research location was determined by purposive sampling method by considering the characteristics of the education level, representation according to geographical location and other considerations that could facilitate the excavation of data and information related to the study of physical and health education learning at the level of elementary school education in Minahasa.

The population of this study was all elementary school students in Minahasa Regency. The research sample technique used purposive sampling involving SDN II Langowan and SD Inpres Tolok in Minahasa District. The instrument used to retrieve data was a questionnaire and test. Variable of self-regulation data was taken using a questionnaire while the variable data of motion coordination was measured by a test instrument. The grid on the regulatory questionnaire includes: 1) The Motivated Strategies for Learning Questionnaire (MSLQ), 2) The Learning and Study Strategy Inventory (LASSI), and 3) The Components of Self-regulated Learning (SRLIS). The grid for the coordination test is: standing on one leg, long jump without start, throwing-catching a tennis ball, zig-zag running, and a short run of 40 meters.

3. Result and discussion
The results of the study for the variable of coordination ability can be displayed as in the data below.

| Item       | Measured                         | Highest score | Lowest score | Mean   | SD     |
|------------|----------------------------------|---------------|--------------|--------|--------|
| Balance    | standing on one leg              | 18.55         | 2.56         | 7.84   | 3.54   |
| Leg power  | long jump without start          | 188           | 93           | 131.91 | 18.72  |
| Coordination| throwing-catching ball           | 19            | 1            | 10.49  | 5.17   |
| Agility    | zig zag run                      | 5.59          | 9.74         | 7.86   | 0.66   |
| Speed      | short distance running (40m)     | 6.96          | 12.82        | 8.27   | 1.1    |

Based on the data of this study prove that self-regulated learners are individuals who are able to determine goals and use the right strategies to achieve learning goals. The results of this study are in line with the opinion of Schunk and Zimmerman who argued that self-regulation of learning is not a
mental ability (intelligence) or academic skills such as reading skills, but a self-direction process that involves the transformation of mental abilities towards individual academic skills [23]. This is a cyclical process where students set their goals, use different strategies to achieve their goals, and monitor and evaluate student performance. Overall, self-regulation of learning encourages students to take learning responsibilities using metacognitive, motivational, and strategic actions [23]. It is evident that students who have high self-regulation ability are able to coordinate good motion as indicated by coefficient of correlation $r = 0.658$ at the 0.05 significance level.

The effect of self-regulation is significant if it is examined that coordination ability is a person's ability to integrate the sensory, nervous, muscle, bone and joint systems harmoniously, quickly, and precisely in performing motor tasks. In an effort to learn to direct the movement it is necessary to be able to assemble movements, differentiate targets, maintain balance, adapt, and find and maintain movement rhythms. Students must be able to (1) set the purpose of coordinating motion to develop games in sports and increase motivation; (2) aware of things that affect emotional conditions and have strategies to regulate emotions so as not to interfere with the activities of motion coordination; (3) monitor progress that is close to the target of mastery of motion coordination on all motion components; (4) examine learning strategies based on progress achieved; (5) evaluate the obstacles that arise and make the necessary adaptations.

For this reason, it is necessary to develop self-regulation capabilities as early as possible, that is, since the age of the children because learning coordination after going through childhood will experience many obstacles for those who learn. In general, the age of children is in elementary school formal education. Self-regulation learning must be instilled early to train students in discipline, responsibility and independence in learning.

4. Conclusion
The motion coordination ability of the basic school students proved to be influenced by the students' internal and external factors. In fact, those factors are existing in self-regulation. It is proven to be used to cultivate discipline, responsibility, and independence in practice. The movement in the student's motion coordination ability in terms of the sensory, nerve, muscle, bone, and joint, in harmony, quickly, and precisely in performing motoric tasks proved to be able to grow well in the students who have high self-regulation.

Thus, the higher the self-regulation possessed by the students, the better their motion coordination ability. It is evident that the students who have high self-regulation abilities are able to coordinate motion well and are shown by the coefficient of correlation $r = .658$ at the significance level of .05. Therefore, the principle of self-regulation must be given intensively at school.

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