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The role of learning strategies on object control skills is reviewed from coordination in children

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Abstract

The ability to control objects is an ability that children must master. Mastery of object control is obtained from one of them from the learning process obtained at school. This learning process can provide students with learning strategies. The study aimed to determine the effect of learning strategies and coordination skills on the ability to control objects in children in elementary school. This research method is quasi-experimental, involving 60 male and female students in grade 5, and the sampling technique used is total sampling. The instruments used in this study on object skills used the test of gross motor development 2nd edition subtest. Movement coordination data uses instruments consisting of anthropometry, balance beams, moving sideways, jumping sideways, and eye-hand coordination. The data were analyzed using the two-way analysis of variance (ANOVA) technique with the help of SPSS 26. Based on the research findings, the TGfU learning approach group had the best average score of 33.86 among other groups. The conclusions of this study show that the object control ability of students with low coordination is better if given conventional learning strategies than TGfU, as evidenced by a value ($p < 0.05$). The conclusion that can be drawn from this study is that TGfU learning strategies influence the ability to control objects in children in elementary school, and there is an interaction between coordination and learning strategies.

Keywords: Learning strategies, object control skill, coordination, children.

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INTRODUCTION

Object control is considered the basis for coordination skills (Rizkyanto et al., 2023). Object control in children is the basis for building

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more complex movements because it existed in the early days of studying various object controls (Hassan et al., 2022; Jones et al., 2020). In addition, object control by having good coordination skills will impact object mastery in children (Bolger et al., 2021). This object control should be taught in early childhood, around 4 to 6 years because this age is a period of growth and development of physical, motor, cognitive, and social children (Widyawan, 2021). Control of this object can be owned by children naturally through the process of maturation and maturity (Martins et al., 2021). However, the thing to remember is that the development of object control is not directly proportional to age and children's ability level. Therefore, it is necessary to give regular training in order to improve object control (Hassan et al., 2022; Rizkyanto et al., 2023).

This basic object control is taught through various approaches, including by (1) only providing instructions for basic movement skills, (2) through games and sports, (3) through physical activity, (4) through video games, (5) professional teacher development and (6) multicomponent approaches (Martins et al., 2021). It should also be noted that interaction is expected in the control of basic objects. One of them is feedback during the learning process. This learning process can be used as a process or approach to learning a skill (Santoso et al., 2021). Optimizing learning in object control is needed; the results obtained teach children to judge appearance, which they cannot see and feel for themselves because other learners can see and evaluate it. Instead, teachers are expected to be able to use feedback in various forms. However, the fact is that feedback is rarely a concern in learning and needs to be remembered by teachers and trainers when carrying out these activities.

One effort to improve the quality of education in Indonesia is by optimizing the learning process, including by increasing teacher competency in transferring knowledge to students so that students have insight, skills, and knowledge as provisions for the future so that the goals of National education can be achieved as it should. Government policy to improve the quality of education requires teachers to have competence in

carrying out their duties as mandated in Law Number 20 of 2003 concerning the National Education System, which states: "Students are guaranteed to actively develop their potential for religious, spiritual power, self-control, intelligence, personality, and noble values through the learning environment and method. To meet learning objectives, a more favorable learning environment (conditions) system must be established"

Physical activity becomes a medium to achieve an educational goal. Physical education is an integral part of education as a whole, and it aims to develop psychomotor, cognitive, and affective aspects (Rizkyanto et al., 2023). Physical education is a medium to encourage physical growth, psychic development, motor skills, knowledge and reasoning, appreciation of values, and habituation of a healthy lifestyle that boils down to stimulating the growth and development of balanced physical and psychological qualities for students. Physical education has an important role for each individual's life (Barnett et al., 2016; Wick et al., 2017). Physical education teachers must be able to understand the ultimate goal of learning so that students are able to do physical activities well. Learning physical education learning later students will understand how to apply a healthy lifestyle in everyday life. Physical education also teaches students about various games related to physical activity to help them feel happy and entertained to do sports every day.

Through well chosen and executed physical education lessons, schools may provide children the chance to participate directly in a variety of learning experiences through sports, fitness, and physical education programs (Van den Berghe et al., 2014). Physical education aims to provide opportunities for children to learn various activities that foster and develop children's potential in physical, mental, social, emotional, and moral aspects (Efrayliana, 2017).

Success in learning physical education must be integrated into using effective and efficient learning methods. Combining teaching and learning principles makes up the instruction technique or learning process. A good learning strategy should be easy for teachers to use and complete, starting

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from the instructions as well as methods and materials and up to the learning model evaluation stage so that teachers will be helped by the strategy (Festiawan et al., 2019; Wicaksono et al., 2020). One of the learning strategies that can be used in interesting and fun PE learning is tactics (TGFU). Teaching Games for Understanding (TGFU) is a method of instruction that places an emphasis on game strategies. As a preliminary explanation, students must understand why and when specific abilities are necessary in the context of the (Qohhar & Pazriansyah, 2019).

Through the TGfU learning strategy, children will be introduced to how to understand sports through basic playing concepts (Tan et al., 2012). The existence of simulations carried out by children will enable them to develop problem-solving abilities in making movements, making hypotheses, manipulating variables, collecting and generalizing data and analyzing movements, connecting and describing, and even concluding movements (Sujarwo & Widayat, 2020; Ribas et al., 2023).

Life is characterized by movement, which is physical activity. To preserve movement, one must engage in a series of regular, scheduled physical activities. Additionally, maintaining movement may help one's fundamental movement talents and skills, enabling one to participate in sports in the future and enhance one's quality of life (Barnett et al., 2016). It has been stated in several studies that mastering movement skills not only improves the quality of a student's movement but also helps improve students' academic, social, and emotional abilities (Putri et al., 2020). These fundamental movement skills are divided into two parts, namely object control and locomotor skills (Syahputra et al., 2021), which are the main material taught at the basic education level (Tsuda et al., 2020).

Object control skills are children's ability to manipulate objects, for example, throwing, kicking, and hitting (Famelia et al., 2018). Coordination is a factor that influences a child's basic movement abilities, especially the ability to control motorbike taxis, both eye-hand coordination and eye-foot coordination. To create an effective and efficient movement, muscles, bones, and joints must work together in harmony for motor coordination to

occur (Lu & Chang, 2012). Basic motion coordination in children is defined as a harmonious and economical interaction of the muscles, skeleton, nervous, and sensory systems aimed at producing appropriate and balanced basic motion actions and adapted reactions to various situations (Santoso et al., 2021). The development of basic motion coordination during preschool is characterized by a sizable, overall individual improvement in mastering fundamental motion challenges. A few students show basic movement coordination problems, such as needing help showing daily drawing and writing routines (Rasyid et al., 2024). Movement quality has been described as the identification of the body's functional compensation, as well as impaired movement control through transitions such as squatting, sitting, and standing, or dynamic movements such as walking, running, and jumping) (Melati et al., 2022; Prasetyo et al., 2022). Many studies say that the ability to coordinate movements cannot be obtained by itself, even though children have enough time for physical activity. However, the coordination of students will develop if taught correctly.

Fundamental movement skills are considered the basis for competence. Basic motion abilities are divided into two major groups, namely object control and locomotor abilities. Locomotor ability is a motion that moves the body from one point to another while dick object ability is an object manipulation movement. The object of control is the ability to improve the performance of the muscles to perform a movement and to have a great ability to make controlled and precise movements with an object (Widyawan, 2021). The ability of object control, according to Stodden, is the ability possessed by a child to manipulate and move objects from one place to another (Hassan et al., 2022), which consists of throwing, catching, and kicking (Syahruddin et al., 2020).

Researchers have high hopes that the provision of learning strategies will be able to provide object control abilities in children in elementary school. Research conducted by experts provides information to researchers that when compared with the object control and

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coordination skills possessed by American children, children in Indonesia are lagging or delayed (Bakhtiar, Famelia et al., 2020; Dilandes et al., 2022). This finding is in line with the reality that researchers found in the field, especially among students at elementary school 004/V Tanjung Pinang Barat, Tanjung Pinang City, Riau Islands Province. Many students need more object control and coordination skills. Based on observations accompanied by physical education teachers at the school concerned, researchers found that the student's ability to control objects and student coordination was still lacking, and this was evidenced by the student's ability to perform various movement tasks.

METHOD

This research is part of a quasi-experimental group using a two-by-two factorial design. This research used research subjects as students at SD N 004/V Tanjung Pinang Barat, Tanjung Pinang City, Riau Islands Province, in September 2023. This research was conducted from October to December 2023. The subjects in this study were students in elementary schools in grade 5, taking students at public elementary school 004/V Tanjung Pinang Barat, Tanjung Pinang City, Riau Islands Province. The technique of taking research subjects took the total population in grade 5 of public elementary school 004/V Tanjung Pinang Barat with 60 students who will be involved in this study.

Object control skills are obtained using the Test Of Gross Motor Development-2 (TGMD-2) sub-test compiled by Ulrich (McGrane et al., 2017). Coordination ability is obtained using the Körperkoordinationstest Für Kinder (KTK) test in the form of four tests, namely Balance beam, Moving sideways, Jumping sideways, and Eye-hand coordination, which focuses on looking at the KTK's movement coordination abilities (Bakhtiar, Syahputra, et al., 2020). Testing the research hypothesis using Two-Way Anova with the help of SPSS 26. This study divided the sample into 4 groups, namely the high coordination group, which was given the TGfU learning strategy (A1B1, n=15), the high coordination group, which was given the Conventional learning strategy (A2B1, n=15), the low

coordination group which was given the TGfU learning strategy (A1B2, n=15), low coordination group who were given conventional learning strategies (A2B2, n=15).

Research Procedure

This research was conducted involving 60 grade 5 students at public elementary school 004/V Tanjung Pinang Barat who were divided into 2 classes, namely classes 5A and 5B. Before giving treatment, the researcher first conducted a pre-test on all samples by administering the TGMD-2 test to determine the student's initial object control skills and the Körperkoordinationstest Für Kinder (KTK) test to determine the students' movement coordination abilities. After the pre-test was carried out, the researcher applied the TGfU learning strategy that the researcher had designed for the class 5A group and conventional learning for class 5B. The treatment was given for 2 months, and after that, the researchers conducted a post-test to determine the extent of improvement in object control skills achieved by the students.

RESULT

The research data based on the division of treatment groups is described below. The participants in this study were 60 grade 5 elementary school students at public elementary school 004/V Tanjung Pinang Barat, Tanjung Pinang City, Riau Islands Province. The students were tested using TGMD-2 after receiving treatment using TGfU and Conventional learning strategies.

Table 1. Description of research data based on a test group

Test group	MD	SD
A1	31.0667	4.01663
A2	29.0000	3.36309
B1	31.4000	3.66343
B2	28.6667	3.51679
A1B1	33.8667	2.66905
A2B1	28.9333	2.76371
A1B2	28.2667	3.08143
A2B2	29.0667	3.97252

Table 1 above displays the standard deviation and average value for each sample group under investigation. According to the statistics, the

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A1B1 group, the group that had TGfU treatment, had the best average score of 33.86 among the other groups.

In this research, there are 5 hypotheses proposed: 1) There are differences in students' object control skills with TGFU and conventional strategies. 2) There are differences in the object control skills of students with those with high and low coordination. 3) There is an interaction between learning strategies and coordination. 4) There are differences in the object control skills of students given the TGFU strategy and conventional ones with high coordination. 5) There are differences in the object control skills of students given the TFGU strategy and conventional ones with low coordination. Below the researcher displays a table of research hypothesis testing results

Table 2. Results of the research hypothesis

Group	*P*
$A_1 > A_2$	< 0.014
$B_1 > B_2$	< 0.001
$A_1B_1 > A_2B_1$	< 0.001
$A_1B_2 < A_2B_2$	< 0.000

Table 2 above is a table of hypothesis testing results, and information was obtained that the proposed hypothesis was proven; there were differences in the control object skills of students at SD N 004/V Tanjung Pinang Barat, Tanjung Pinang City, Riau Islands Province, who were given TGFU and conventional learning. Learning strategy, where the object control skills of students who were given the TGFU learning strategy were better ($p<0.05$). The hypothesis, which states that the object control skills of students with high motor coordination abilities are also better than those with low coordination, is also proven ($p<0.05$).

Furthermore, the hypothesis, which states that there is an interaction between coordination and learning strategies, is also proven ($p<0.05$). It is found that for the fourth hypothesis, the ($p<0.05$), which means that the hypothesis is accepted that there are differences in the control object skills of students who are taught using TGfU and conventional strategies with high coordination abilities. As a result, children who have high coordination abilities and are given the TGfU

strategy have better object control skills. Furthermore, the fifth hypothesis proposed was also proven, that the object control skills of students with low coordination are better if given conventional learning strategies rather than TGfU, as evidenced by the value of ($p<0.05$). Based on the research findings, all the proposed hypotheses are accepted, and in fact, the learning strategies and movement coordination abilities of children greatly influence the improvement of their object control skills.

DISCUSSION

Based on the research that has been conducted, it was found that there were differences in the object control skills of students who were given learning using TGfU and conventional strategies. Where children who were given the TGfU learning strategy had better object control skills ($p<0.05$), it was also found that the object control skills of students with high coordination were better than students with low coordination ($p<0.05$). Researchers also found that there was an interaction between coordination and learning strategies on students' object control skills ($p<0.05$). Another finding was that students who were given the TGfU learning strategy with high coordination of object control skills were better than students who were given conventional learning strategies ($p<0.05$). Researchers found that students who have low coordination are more suitable if given conventional learning strategies compared to TGfU ($p<0.05$)

In order for children to grow physically and motorically in the best possible way, parents and instructors must participate at home. Like the NASPE (National Association for Sport and Physical Education) directive, it is said that children are required to carry out structured and unstructured physical activity (Syafruddin et al., 2020). This structured physical activity is a physical activity whose implementation is guided by someone who is responsible at school, namely the physical education teacher (Goodway et al., 2014). The various gross motor skills children achieve are useful for later life. For example, if children are accustomed to being skilled at running or climbing, if they are older, they will enjoy exercising. For

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children's fundamental motor skills to reach maturity, continuous practice and teaching are needed and accompanied by an effective learning approach (Tsuda et al., 2021). One learning approach that is suitable for elementary school children is the play method. Playing is one of the children's activities. Play activities are fun activities for elementary school children. Through play activities, children carry out various movement experiences. Thus, through playing activities, there will be an increase in movement skills and various other important aspects (Dong et al., 2021).

The learning strategy approach used by teachers at school will greatly determine the quality of the fundamental motor skills possessed by their students. A competent teacher is a teacher who can design learning methods that suit the needs of his students. Research by Andrini, (2016) concluded that the learning process is a teaching treatment used in the school environment to achieve the expected goals. Among the learning method approaches used are the TGFU and conventional approaches. TGfU is a physical education learning approach that allows children to understand sports through forms in the concept of play so that sports will be more dynamic and appropriate to children's development (Stolz & Pill, 2014). As the name suggests, in this tactical game model the teacher must be able to invite students to solve tactical play problems. Every student is curious about how to play the game and wants always to be involved.

The next strategy teachers can use is conventional learning strategies, which are usually or often used by teachers in teaching and learning activities. The conventional learning process generally takes place in only one direction, from teacher to student. Through the conventional learning model, students can understand the material. In traditional learning, the teacher is the dominant source of knowledge in the classroom, teachers are the senders of knowledge, and students are the receivers (Khalaf & Zin, 2018). According to Bellanca, Conventional learning emphasizes teacher control over most events and the presentation of structured learning in the classroom (Prilop et al., 2021).

Apart from appropriate learning strategies so children's object control skills can reach the maximum level, they must also be supported by other factors, including coordination ability. To create an effective and efficient movement, muscles, bones, and joints must work together harmoniously for motor coordination (Faber et al., 2018). Motor coordination skills are strongly correlated with cognitive development, a physically active lifestyle, development of sports performance and other health benefits (Matarma et al., 2020).

On the other hand, movement coordination is a general construct underlying the development of basic movement coordination and specific movement skills (Mardiansyah et al., 2023). In contrast to motor skills, motor coordination has been shown, via prior studies, to be a rather stable characteristic (Vandorpe et al., 2012). To satisfy the demands of school, home, sports, and social situations, children require a repertoire of gross and fine motor abilities, ranging from running and leaping to writing and sketching (Escolano-Pérez et al., 2022).

To master good coordination skills, it is necessary to repeat exercises directed towards movement automation, so that coordination skills are not innate but must be learned and repeated continuously (Limanskaya et al., 2021). If children have low or poor motor coordination skills, the problem not only hinders the development of children's motor skills but can also affect academic achievement, perceived competence, activeness in participating in physical activities and social interactions, and comfort. In playing with their peer group (Vandorpe et al., 2011). Children who lack motor skills are also more prone to acquire behavioral patterns or participate in sedentary activities, both of which increase the risk of childhood obesity (Castetbon & Andreyeva, 2012).

From the study results, students can help other students complete movement activities; they need to have basic motor skills from an early age. However, failure to master these basic motor skills will negatively impact children's health, social and cognitive development, and physical motor development. As a result, using learning methods is one solution to

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supporting students' efforts to acquire basic motor skills. One such strategy is to create learning techniques through games that are liked and suitable for children's abilities. In order for students to assist other students in completing movement activities, they need to possess fundamental motor skills from an early age. However, failure to master these fundamental motor skills will negatively impact children's health, social and cognitive development, and physical motor development. Suitable learning methods may support students' attempts to acquire fundamental motor abilities. One such strategy is creating learning techniques through games that kids like, like TGfU. This study cannot be generalized because the scope used is small and limited to a few samples. Therefore, this study's results can be influenced by a very small number and category of subjects. The results of this study can be compared with the results of future research, research that can be carried out on a national scale and between regions with different characteristics.

CONCLUSION

The research results show that the learning strategies teachers use to improve children's object control skills are very influential. It was found that children with high coordination abilities who were given the TGFU strategy had higher object control skill scores than those who were given the conventional strategy. Children with low coordination who were given the TGFU strategy actually got lower object control skill scores compared to those given the conventional strategy. This proves that even though a learning strategy may be successful in one group, it may not necessarily be successful if applied to other samples with different characteristics. Therefore, the astuteness of physical education teachers is highly required in analyzing and designing learning strategies to suit children's needs. Researchers plan future investigations of the object control abilities of primary school pupils. Scholars also expect other scholars to conduct more studies on object control abilities.

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