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The effect of learning strategies and reflex movements on 10-finger typing skills of Medan aviation polytechnic cadets

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Abstract

The purpose of this research is to determine whether the typing skills of cadets trained using *plus tone software* are better than those using software alone, whether the typing skills of cadets who have high reflex movements are better than those who have low reflex movements, and whether there is an interaction between the use of 10-finger typing training software and reflex movements in influencing typing skills. The population of the study was the Air Traffic Control Department Cadets at the Medan Aviation Polytechnic, Indonesia. The sampling technique in this study was a random group sampling technique *(cluster random sampling)*, namely 4 Classes 2 classes were selected as samples that were given treatment through random selection. The analysis technique was a two-way ANOVA at a significance level of 0.05 which was continued with the Scheffe test. The results of the study were : (a) The average learning outcomes of typing skills of cadets taught with fixed rhythm software ($\bar{X}$ = 94.82) were higher than the average learning outcomes of typing skills of cadets taught with fixed rhythm software ($\bar{X}$ = 93.12) with F_{count} = 11.09 > F_{table} = 4,004, (b) The average learning outcomes of typing skills for cadets with high reflex motor abilities ($\bar{X}$ = 94.82) are higher than the learning outcomes of typing skills for cadets with low reflex motor abilities ($\bar{X}$ = 93.11), with F_{count} = 8.84 > F_{table} = 4,004, and (c) there is an interaction between learning strategies and reflex motor abilities on learning outcomes of typing skills with F_{count} = 5.49 > F_{table} = 4.004. The results of the data analysis concluded that for cadets with high reflex movement ability characteristics, the appropriate learning strategy used is fixed rhythm software. For cadets with low reflex movement ability characteristics, the appropriate learning strategy used is software only. The implications of this study are specifically aimed at the Indonesian Ministry of Transportation and teaching staff.

Keywords: 10-finger typing skills, Aviation engineering, Learning strategy, Reflex movement, Safety academy cadets.

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1. Introduction

In the Air Transportation sub-sector, the sector that plays a fairly important role is the Air Traffic Control sector, hereinafter referred to as PLLU. Personnel working in this sub-sector are responsible for flight safety, assisted by other fields such as engineering, administration, and others. They are the spearheads of aircraft traffic management, ensuring that they cross predetermined routes in an orderly manner to prevent collisions between aircraft or with other objects such as mountains, tall buildings, towers, and so on. To develop strong PLLU personnel, the government, in this case, the Ministry of Transportation, through the Transportation Human Resources Development Agency, routinely recruits transportation technicians from all over the country every year and trains them to become professional transportation personnel, especially in the Air Transportation sub-sector. The results of this recruitment then undergo training at Aviation Education and Training institutions spread throughout the archipelago. One of these institutions is the Aviation Polytechnic located in the city of Medan, which serves as a regional training center in North Sumatra, in addition to the national one, namely the Indonesian Aviation College (STPI) located in Curug, Banten Province.

Personnel assigned to PLLU are required to master fast typing skills. This skill is useful so that they can also send data in a typed format to other airports. In preparation for the implementation of the latest communication system that will be applied in Indonesia, namely Communication Navigation Surveillance/Air Traffic Management abbreviated as CNS/ATM. In this new system, communication between PLLU and pilots no longer uses verbal language but uses a data communication system. This is due to the weaknesses of the system that have been used so far, such as noise on radio waves and limited reach. Therefore, 10-finger typing skills for a PLLU Cadet are basic skills that must be mastered. The process of mastering this skill must also be absorbed by cadets promptly, namely within 1 semester (approximately 5 months), referring to the rules of the dormitory training system.

For this reason, it is necessary to research a better learning method so that the Medan Aviation Polytechnic cadets can master 10-finger fast typing skills within the specified time. So far, cadet typing learning has been conducted using computer media supported by a fast typing training tutorial program, "Learn Typing Quick and Easy." To further accelerate the achievement of the target time for mastering 10-finger fast typing skills, the researcher wants to add another method in addition to the methods that have been implemented so far. This method involves incorporating the role of a tool called a metronome. This metronome is a device that produces a constant tone sound, similar to a beat in a song, the speed of which can be adjusted by the instructor according to the skill level [1]. The cadets type according to the tutorial software guide, but the typing tempo still follows the tone produced by the metronome.

So far, cadets have been doing typing training following the instructions given by the tutorial software without keystroke guidance. Each exercise is first set to a typing speed, for example, 10 words per minute. Then cadets start typing the letters on the monitor screen. Sometimes, if they have memorized the keys, the tapping is faster; if they have not memorized the keys, the tapping is slow. At the end of the exercise, a score will appear showing how many words have been successfully typed, what percentage of keystroke errors there are, and the maximum speed that can be achieved. The weakness is that because the typing tempo is not constant, it takes longer to master typing skills. For this reason, researchers want to add another strategy, namely by setting the rhythm of cadets' typing at a certain speed with the help of a tool called a Metronome [2]. Beginners are given a tone with a low tempo, for example, 10 words per minute. Then, after becoming proficient, it can be increased successively to 15 words per minute, then 20 words per minute, and so on. If you are proficient at typing at a speed of 25 words per minute, then cadets can be recommended to pass the Typing course. The typing training strategy is not only using computer media assisted by 10-finger typing tutorial software, but can also be done using a manual typewriter with the same training sequence. However, the weakness is that the instructor will work harder to calculate one of the results of the cadet's typing training, and this will also take a long time.

Based on the background and identification of the problem, the formulation of the problem that can be raised in this study can be formulated as follows: Are the typing skills of cadets trained using fixed rhythm software better than those using software alone? Are the typing skills of cadets who have high reflex movements better than cadets who have low reflex movements? Is there an interaction between the use of 10-finger typing training software and reflex movements in influencing typing skills? This study aims to determine the difference in the results of mastering 10-finger fast typing skills by only utilizing typing training software compared to typing training with fixed rhythm tutorial software. Differences in the background of cadets' reflex movements and the results of mastering 10-finger typing skills. Interaction between the 10-finger typing training method and reflex movements.

2. Literature Review

2.1. The Essence of 10 Finger Typing Skills

Typing is a process in which text or numbers are entered into a device such as a typewriter, computer, or calculator by pressing keys on the keyboard. Typing is a job in the form of a skill that is highly desired by everyone who has a basic general education [3]. As explained in the background, fast typing skills are one of the skills that must be possessed by PLLU personnel as an important asset for work, both now and in the future. In the future, all flight safety system equipment will be rejuvenated and replaced with a computer-based system. Currently, sending messages from the ground to the aircraft uses verbal communication. In the future, when implementing a new system called CNS/ATM, sending messages will utilize a data transfer system called CPDLC (Controller-Pilot Data Link Communications) using computer facilities that connect stations on the ground with computers on the aircraft via satellite [4]. This will be carried out smoothly if PLLU personnel are skilled at typing quickly.

2.2. Learning Strategy

Anderson and Krathwohl [5] explained that learning strategies are learning activities that must be carried out by teachers and cadets so that learning objectives can be achieved effectively and efficiently. The same thing was explained by Carey et al. [6], who also stated that learning strategies are a set of learning materials and procedures that are used together to produce learning outcomes in cadets. DePorter and Hernacki [7] argue that learning strategies are a comprehensive approach that can be divided into two basic strategies, namely expository (explanation) and inquiry/discovery (discovery), These two strategies can be viewed as two ends that are in line in a strategy continuum. This is closely related to the deductive approach where this strategy begins with the presentation of information about principles or rules then followed by a test of mastery and application in the form of examples and applications in certain situations, while the lesson discovery strategy is sought and found by the cadets themselves through various activities, so that the teacher's task is more as a facilitator and guide for the cadets, because of its nature, this strategy is often also called an indirect learning strategy [8]. In line with the opinion above, Dick et al. [9] define learning strategies as a comprehensive system consisting of input, processing, and output/product components.

1. The effectiveness of classroom learning strategies in achieving learning objectives can be seen from how high the learning outcomes achieved by cadets are. Dick et al. [9] also explained that learning strategies describe the general components of a set of learning materials used to produce cadet learning. The learning strategy contains four components, namely: (1) the sequence of learning activities, which refers to the order of teacher activities in conveying lesson content to cadets, (2) learning strategies, which describe how teachers organize lesson materials and cadets to ensure that the learning process occurs effectively and efficiently, (3) learning media, which includes the equipment and learning materials used by teachers and cadets during the learning process, and (4) the time allocated by teachers and cadets to complete each step in the learning activity. To determine the level of effectiveness of the learning strategy used in the learning process over a certain period, one must measure the learning outcomes of cadets [10].

2.3. Learning Strategy of "Software Learn Typing Quick and Easy"

The typing training strategy for PLLU Cadets at the Medan Aviation Polytechnic is to use computer-based equipment, where the software media used is software designed to train Cadets repeatedly to be able to type quickly. The method applied to the software is almost the same as the games that are often played by children and adults on home computers. This tutorial program is called "Learn typing quick and easy"; in it, there are many choices of fast typing training programs along with exercises that contain varying levels of difficulty [11]. Instructors or lecturers only need to choose which program is suitable and practice from easy to high-level exercises [12].

Before the typing practice is carried out, the instructor first provides typing theory. The typing method is a 10-finger system. Each finger is only intended to press certain keys. It is not allowed for one finger to type two of the same keys. After the theory, the practice begins. At the beginner stage, the initial exercise has a speed of 10 words per minute. On the monitor screen are listed the letters and numbers that the cadet must type with the correct keys. If the key pressed is different from the letter or number on the screen, then the percentage word score is reduced. That's how the exercise is done repeatedly, two times a week, four credits for one semester. Here, the cadet types the letters on the monitor screen with an inconsistent tapping speed. Sometimes, if they have memorized the keys, the tapping is fast; if they haven't memorized the keys, the tapping is slow. At the end of the exercise, a score will appear showing how many words were successfully typed, what percentage of keystroke errors, and the maximum speed that can be achieved. The weakness is that because the typing is not constant in tempo, the long-term memorization process takes longer to master. After three or four weeks, many cadets have mastered the keyboard keys at a speed of 10 words per minute. Thus, the speed can be increased to 15 words per minute. The exercise is repeated over and over again until truly proficient. After being skilled enough with a speed of 15 words per minute, it can be increased again to a higher speed, namely 20 words per minute. At an advanced level, the typing speed trained is 25 words per minute.

2.4. Rhythmic Software Remains on Learning Typing.

Movement and rhythm-based learning aims to develop and grow learning experiences for students through movement and rhythm patterns by physical, emotional, social, and intellectual development [13]. Rhythmic movement is a science because it is arranged systematically, directed, and useful for human interests. The science of rhythmic movement is an applied science for a teacher to compile and design learning programs inside and outside the classroom as a vehicle for overcoming learning difficulties for students. The ability to compile learning programs based on rhythmic movement is proof of the professionalism of a teacher [14].

A metronome is a tool used to determine the speed of the rhythm of a song when playing music. The metronome here is an electronic device that can produce a tone sound whose rhythm speed can be adjusted according to needs [12]. Cadets press the keys on the computer keyboard in time with the sound of the metronome tone. By typing following the constant tempo produced by the metronome, the brain has time to quickly memorize the keys on the keyboard [15]. If with the initial speed of the metronome tone, the cadet is skilled at typing, then the frequency of the tone rhythm from the metronome can be accelerated according to the stages in the typing training program. The frequency of the tone rhythm on the metronome will not be increased if the cadet or student is not yet able to the previous frequency or a slower frequency. And so on until the highest speed according to the requirements [16]. The purpose of providing a constant rhythmic tone during typing training is to make the cadets' attention to the keys that are pressed more focused, so that by adding a metronome as a complementary tool for computer software, it can be assumed that it will accelerate cadets in mastering typing skills [17]. In addition, in this study, the frequency of the tone rhythm given was gradual, starting from the slowest to the highest speed, this aims so that cadets (students) can understand and be skilled in typing because the tempo given is gradual, and will not reach the next stage if the previous stage can be completed well, so that cadet skills can be formed [18].

2.5. The Nature of Reflex Movement Ability

Movement is a response to stimuli both from within the body and from outside the body. Movement is a very simple coordination pattern that explains the transmission of impulses by nerves [19]. In performing body movements, we coordinate a lot with other body parts. All movement mechanisms that occur in our bodies cannot be separated from the role of the nervous system. This nervous system is composed of nerve tissue, which contains nerve cells or neurons. Although the nervous system is very complex, it is only composed of two types of cells, namely nerve cells and neuroglia cells [19]. Reflex movements occur very quickly, and responses happen automatically to stimuli, without requiring control from the brain. Thus, it can be said that movement occurs without being influenced by will or without being realized first. Examples of reflex movements include blinking, sneezing, or coughing. Reflex movement is produced by the simplest nerve pathway. This nerve pathway is formed by a sequence of sensory neurons, interneurons, and motor neurons, which transmit nerve impulses for certain types of reflexes. The simplest reflex movements only require two types of nerve cells, namely sensory neurons and motor neurons. Reflex movements operate not under a person's consciousness [20].

In reflex movements, impulses go through a short path or shortcut, namely starting from the stimulus receptor, then forwarded by sensory nerves to the nerve center, received by the connecting nerve set (association) without being processed in the brain, the response is immediately sent to the motor nerve to be delivered to the effector, namely muscles or glands [21]. This shortcut is called a reflex arc. Reflex movements can be distinguished as brain reflexes if the connecting nerves (association) are in the brain, for example, the movement of blinking or narrowing the pupil when there is light, and spinal cord reflexes if the connecting nerve set is in the spinal cord, for example, reflexes in the knee [22].

2.6. Framework of Thinking

2.6.1. The Effect of Typing Skill Learning by Only Using the Tutorial Software "Learn Typing Quick and Easy" With a Fixed Rhythm From The Metronome and Learning Using Only Software

Learning to type quickly with a fixed rhythm means that cadets can learn by themselves according to their abilities. The fixed rhythm of typing can provide an opportunity for the brain to record the assignment of each finger to the keys that have been determined more permanently in long-term memory. This will not be found in typing training that only uses software. Here, only the accuracy of the keys on the fingers is trained. Cadets who have high reflex movements will be able to master fast typing skills more quickly, while cadets who have less reflex movement will need a longer time to master the skill. Furthermore, cadets who practice typing quickly with a fixed rhythm will look more focused on how to practice and will find it easier to control their own emotions. By following the rhythm produced by the metronome, the desire to speed up the completion of an exercise due to having memorized the keys will be controlled by the procedure that must be followed through the tempo of the metronome rhythm. Whereas when only using software, this is difficult to implement. Cadets will continue to type as they please, which will result in continuing to have difficulty remembering keys that they have not memorized. From the description above, it can be concluded that by learning to type quickly with rhythm, optimal skill development can be achieved compared to non-rhythmic ones.

2.6.2. The Influence of High and Low Reflex Movements on 10-Finger Typing Skills Training

Reflex movements will greatly affect the mastery of fast typing skills among cadets. Each cadet has different reflex movements; some cadets have high, medium, and low reflex movements. These conditions each affect the time required to master fast typing skills. Cadets who have high reflex movements tend to master typing skills faster than those with fewer reflex movements. However, if cadets with high reflex movements are faced with rhythmic typing training, it can still be predicted that they will have difficulty following the training in the initial stages due to the hampered development of their typing skills, as these cadets are already more skilled. Nevertheless, they will be able to adjust to typing training at a higher level.

2.6.3. The Effect of Interaction of Fixed Rhythmic and Non-Rhythmic Typing Training on the Background of Reflex Movements in Typing Training

The cadet's reflex movements affect their abilities in fast typing training. The higher the cadet's reflex movements, the greater the hope that the cadet in question will master fast typing skills faster. Conversely, the lower the cadet's reflex movements, the longer it will take to master the skill. In short, the time needed to master the cadet's typing skills is also influenced by the learning strategy provided. Learning to type using software allows cadets to practice individually and independently based on their respective abilities, accompanied by the initial talent from within themselves. Therefore, it can be said that learning fast typing skills can be influenced by the learning system and the initial talent of the cadet. From the explanation above, it can be assumed that if the fast typing learning strategy using software is modified with a fixed and gradual rhythmic learning method produced by a metronome, it will be able to improve the mastery of typing skills by cadets who have high initial talent. Meanwhile, the group of cadets who already have high reflex movements are expected to experience difficulties in the initial training stage but will be able to quickly adapt to higher-level training.

2.7. Research Hypothesis

Based on the above framework of thinking, the following research hypotheses can be formulated:

a. The typing skills of cadets trained using the rhythm software are better than those using the software alone.
b. The typing skills of cadets who have high reflex movements are better than those who have low reflex movements.
c. There is an interaction between the use of 10-finger typing training software and reflex movements in influencing typing skills.

2.8. Methodology

The location of this research is the Aviation Polytechnic in Medan, Indonesia. For the 2025 academic year, the research was conducted at the beginning of the second semester, from February to April 2025. The population of this research consisted of all cadets majoring in Air Traffic Control in the 2025 academic year, which included 4 classes. Furthermore, to determine the research sample, the sampling technique used in this study was the cluster random sampling technique, whereby 2 classes were selected from the 4 classes as samples that were subjected to treatment through random selection. This study employs an experimental method with a quasi-experimental design. The design of this research is a 2 X 2 factorial design as shown in Table 1.

Table 1.
Research Design.

Learning strategies / Reflex Movement	Learning with software + constant rhythm (A1)	Learning with software (A2)
Height (B1)	A1B1	A2B2
Low (B2)	A1B2	A2B2

The data collection technique in this study used a testing method to collect data on reflex movements in the form of a performance test, specifically by dropping a ruler parallel to the participant's hand, and then the student catches it, which is done repeatedly three times. The catch results are measured in centimeters of the ruler in the student's grasp and then averaged. Participants with an average catch of less than 10 centimeters are categorized as having high reflex movement abilities, while those with more than 10 centimeters are categorized as having low reflex movement abilities. Performance tests are also used to collect data on 10-finger typing skills. In this case, students are given a script to type within a certain duration of time. The typing results will be evaluated based on the aspects of WPM (words per minute), Adjusted WPM (adjusted words per minute), Peak WPM (maximum words per minute), and Accuracy. The score range used is 0 to 100.

After the data is obtained, it is then analyzed, which includes the analysis requirements test and hypothesis testing. In this study, the analysis of variance (ANOVA) test was used to test the hypothesis. Before the hypothesis is tested, the analysis requirements test is carried out, namely the normality test and the data homogeneity test. Data Normality Test: To test whether the sample data from the population is normally distributed, the Lilliefors normality test is used. The Homogeneity Test, to test whether the sample group from the population has homogeneous distribution properties, is carried out using the Fisher test and the Bartlett test. Hypothesis Testing with analysis of variance (ANOVA) is conducted with a significance level of 5% (0.05). This is done to test the significance of one variable or a combination of two independent variables on the dependent variable [23]. If the results of the F-count analysis show a difference in the average of the dependent variable from the two samples as a result of the independent variable, then the analysis is continued with a test using the Scheffé test and statistical hypothesis.

3. Result of Research

3.1. The Results of Learning Typing Skills of Cadets using a Fixed Rhythm Software Learning Strategy

The learning outcomes data of typing skills of cadets taught using a fixed rhythm software learning strategy are known to be mean = 94.82; mode = 93.90; median = 94.50; variance = 7.75; standard deviation = 2.78; maximum score = 100; and minimum score = 90. The distribution of learning outcomes of typing skills of cadets taught using a fixed rhythm software learning strategy as a whole can be seen in Table 1.

Table 2.
Typing skill results in a fixed rhythm software learning strategy.

Interval Class	$f_{absolut}$	$f_{relatif}$
90 – 91	3	9.68
92 – 93	8	25.81
94 – 95	9	29.03
96 – 97	5	16.13
98 – 99	4	12.90
100 – 101	2	6.45
Total	31	100

Based on the data in Table 2, it can be explained that with a mean of 94.82 in the interval class 94-95, this means that there are 29.03% of respondents at the class average score, 35.490% below the class average score and 35.48% above the class average score.

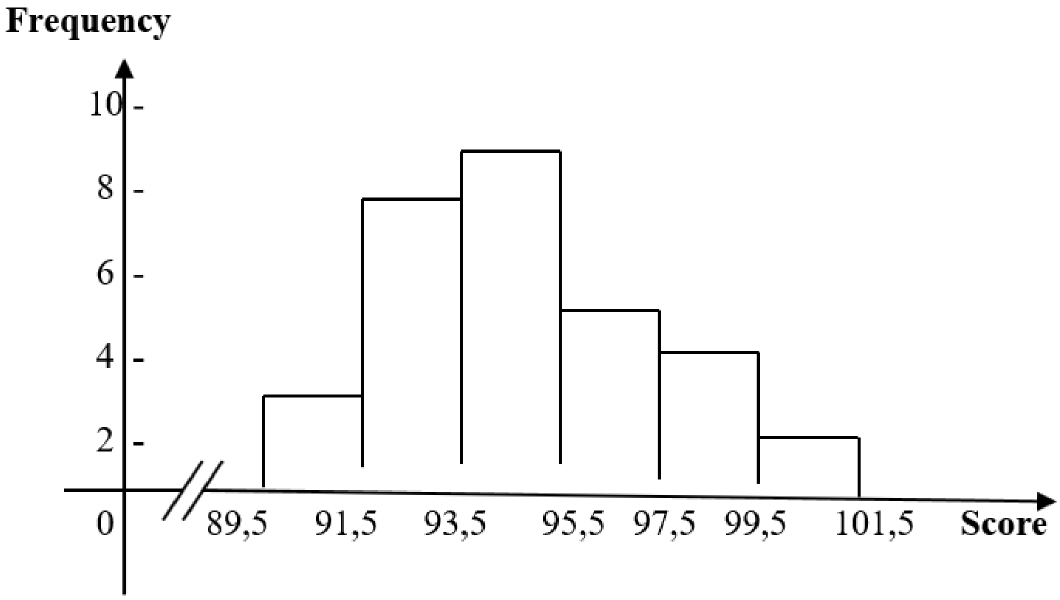

Figure 1.
Histogram of Cadet Learning Outcomes - Fixed Rhythm Software Learning Strategy.

3.2. The Results of Learning Cadets' Typing Skills with Software Learning Strategies

The learning outcome data of typing skills of cadets taught using a software learning strategy is known as mean = 93; mode = 93; median = 93.12; variance = 5.01; standard deviation = 2.23; maximum score = 98; and minimum score = 88.

Table 3.
Results of Cadets' Typing Skills in Software Learning Strategies.

Interval Class	$f_{absolut}$	$f_{relatif}$
88 – 89	2	6.25
90 – 91	5	15.62
92 – 93	11	34.38
94 – 95	9	28.13
96 – 97	5	15.62
Total	32	100

Based on the data in Table 3, it can be explained that with a mean of 93 in the interval class 92-93, this means that there are 34.38% of respondents at the class average score, 21.87% below the class average score, and 43.75% above the class average score. Furthermore, the histogram graph is presented as follows:

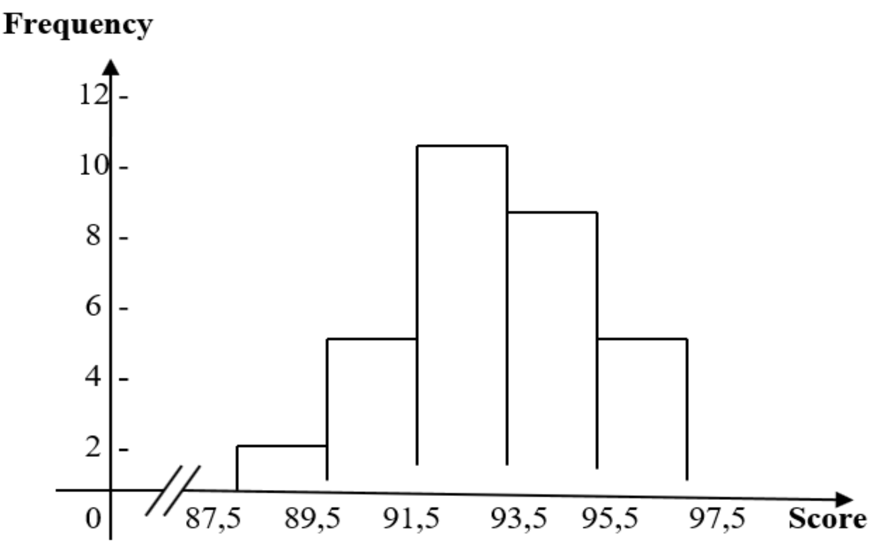

Figure 2.
Histogram of Cadet Learning Outcomes with Software Learning Strategy.

3.3. The Results of Learning Cadets' Typing Skills with High Reflex Movement Ability

The learning outcomes of typing skills of cadets with high reflex movements taught with a fixed rhythmic software learning strategy and a software learning strategy are known to be mean = 94.82; mode = 94.50; median = 94.75; variance = 8.55; standard deviation = 2.92; max score = 100; and minimum score = 88.

Table 4.
Results of Cadets' Typing Skills on High Reflex Movement Ability.

Kelas Interval	$f_{absolut}$	$f_{relatif}$
88 – 89	2	5.41
90 – 91	2	5.41
92 – 93	7	18.92
94 – 95	12	32.42
96 – 97	7	18.92
98 – 99	5	13.51
100 – 101	2	5.41
Total	37	100

Based on the data in Table 4, it can be explained that with a mean of 94.82 in the interval class 94-95, means that there are 32.42% of respondents at the class average score, 29.74% below the class average score, and 37.84% above the class average score. The histogram graph is as follows:

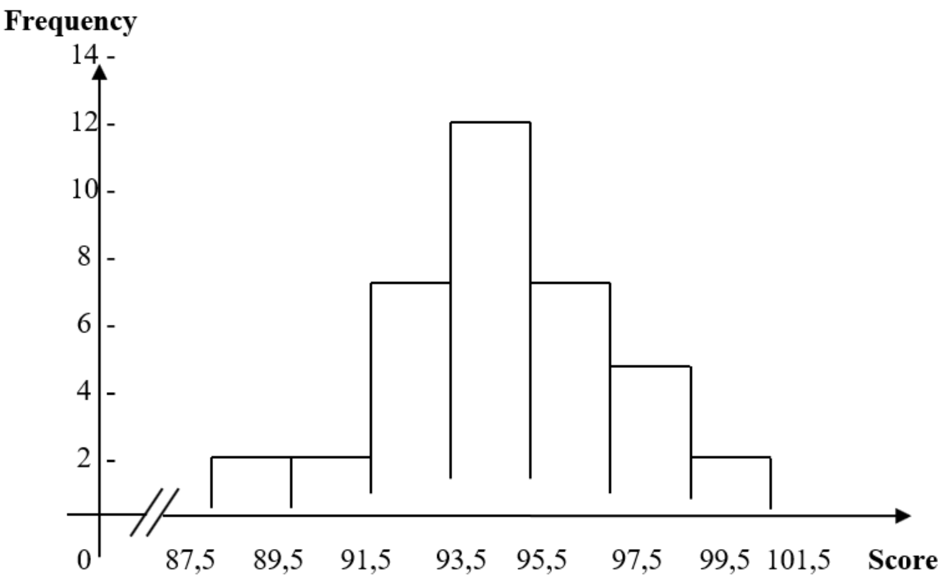

Figure 3.
Histogram of Typing Skills Learning Outcomes of Cadets with High Reflex Movement Abilities.

3.4. The Results of Learning Cadets' Typing Skills with Low Reflex Movement Abilities

Data on the learning outcomes of typing skills of cadets with low reflex movements taught with fixed rhythmic software learning strategies and software are mean = 93; mode = 93.90; median = 93; variance = 8.06; standard deviation = 2.83; maximum score = 97; and minimum score = 90.

Table 5.
Typing Skills Results of Cadets with Low Reflex Movement Abilities.

Interval Class	$f_{absolut}$	$f_{relatif}$
90 – 91	6	23.08
92 – 93	8	30.77
94 – 95	10	38.46
96 – 97	2	7.69
Total	26	100

Based on the data in Table 5, it can be explained that with a mean of 93 in the interval class 92 - 93, means that there are 30.77% of respondents at the class average score, 23.08% below the class average score, and 46.15% above the class average score.

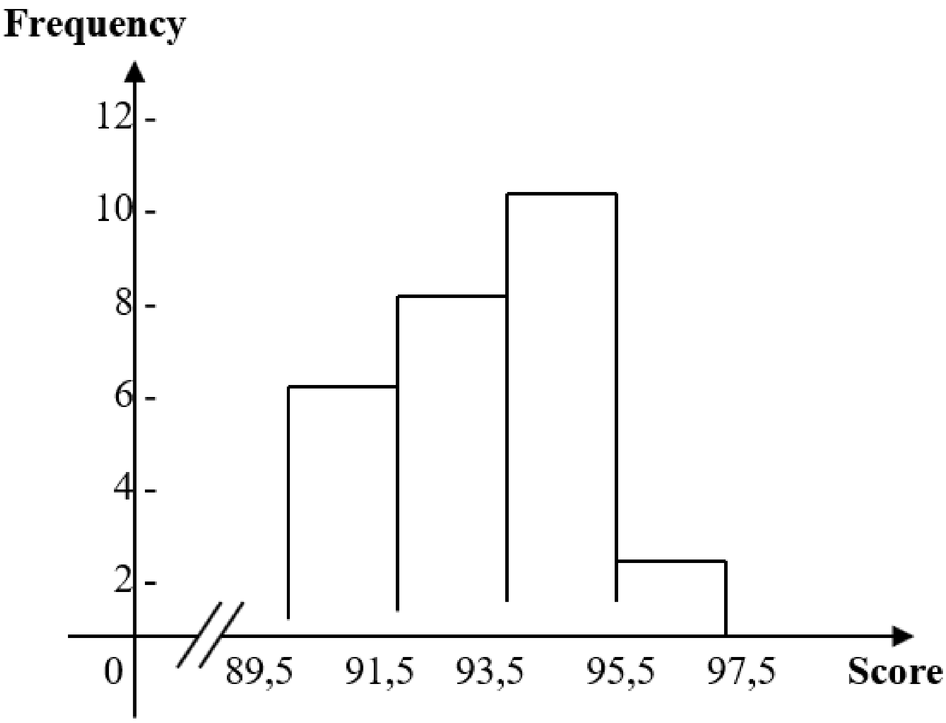

Figure 4.
Histogram of Typing Skills Learning Outcomes of Cadets with Low Reflex Movement.

3.5.The Results of Learning Cadets' Typing Skills with Fixed Rhythm Software Learning and High Reflex Movements

Data on the learning outcomes of typing skills of cadets taught with a fixed rhythmic software learning strategy and high reflex movements are known to be mean = 96; mode = 94.50; median = 95.50; variance = 6.77; standard deviation = 2.60; maximum score = 100; and minimum score = 92.

Table 6.
Results of Typing Skills of Cadets with Fixed Rhythm Software Learning and High Reflex Movements.

Interval Class	$f_{absolut}$	$f_{relatif}$
92 – 93	4	20.00
94 – 95	6	30.00
96 – 97	4	20.00
98 – 99	4	20.00
100 – 101	2	10.00
Total	20	100

Based on the data in Table 6, it can be explained that with a mean of 96 in the interval class 96-97, this means that there are 20.00% of respondents at the class average score, 50.00% below the class average score, and 30.00% above the class average score.

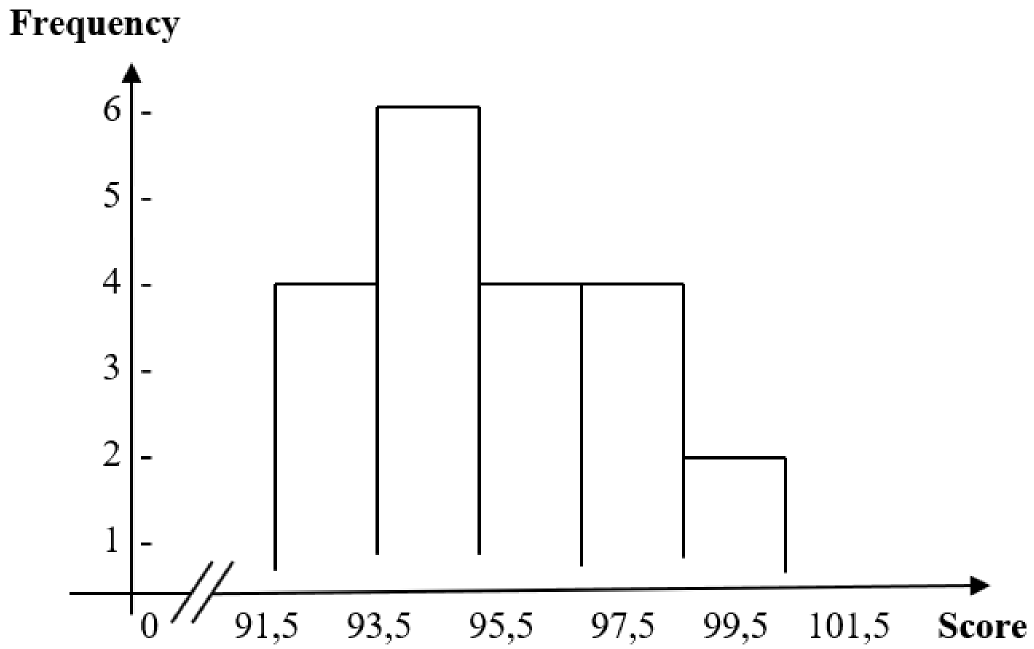

Figure 5.
Histogram of Cadet Learning Outcomes with Fixed Rhythm Software Learning Strategy and High Reflex Movement.

3.6. The Results of Learning Cadets' Typing Skills with Fixed Rhythm Software Learning and Low Reflex Movements

Data on the learning outcomes of typing skills of cadets taught with a fixed rhythmic software learning strategy and low reflex movements are known to be mean = 92.86; mode = 92.50; median = 92.75; variance = 3.85; standard deviation = 1.96; maximum score = 97; and minimum score = 90.

Table 7.
Results of Typing Skills of Cadets with Fixed Rhythm Software Learning and Low Reflex Movements.

Interval Class	$f_{absolut}$	$f_{relatif}$
90 – 91	3	27.27
92 – 93	4	36.36
94 – 95	3	27.27
96 – 97	1	9.10
Total	11	100

Based on the data in Table 7, it can be explained that a mean of 92.86 in the interval class 92 - 93, means that there are 36.36% of respondents at the class average score, 27.27% below the class average score, and 36.37% above the class average score.

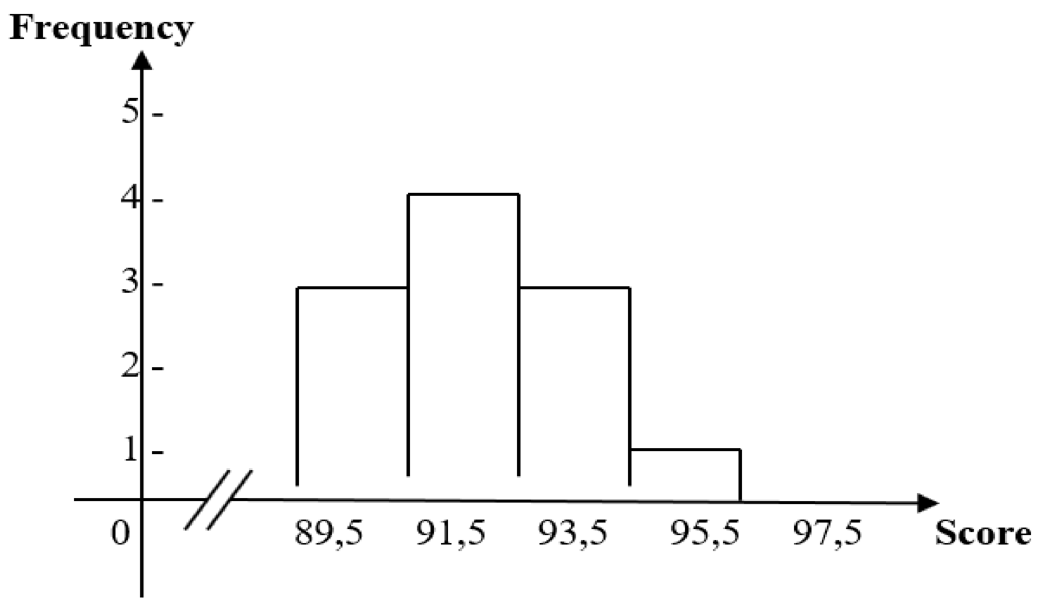

Figure 6.
Histogram of Learning Outcomes of Cadets with Fixed Rhythm Software Learning Strategy and Low Reflex Movement.

3.7. The Results of Learning Cadets' Typing Skills with Software Learning and High Reflex Movements

The learning outcome data of typing skills of cadets taught with software learning strategies and high reflex movements are known to be mean = 94; mode = 94.5; median = 94; variance = 8.05; standard deviation = 2.83; maximum score = 98; and minimum score = 88.

Table 8.
Typing Results of Cadets with Software Learning and High Reflex Movements.

Interval Class	$f_{absolute}$	$f_{relatif}$
88 – 89	2	11.76
90 – 91	2	11.76
92 – 93	3	17.65
94 – 95	6	35.29
96 – 97	3	17.65
98 – 99	1	5.89
Total	17	100

Based on the data in Table 8, it can be explained that a mean of 94 in the 94-95 interval class means that there are 35.29% of respondents at the class average score, 41.17% below the class average score, and 23.54% above the class average score.

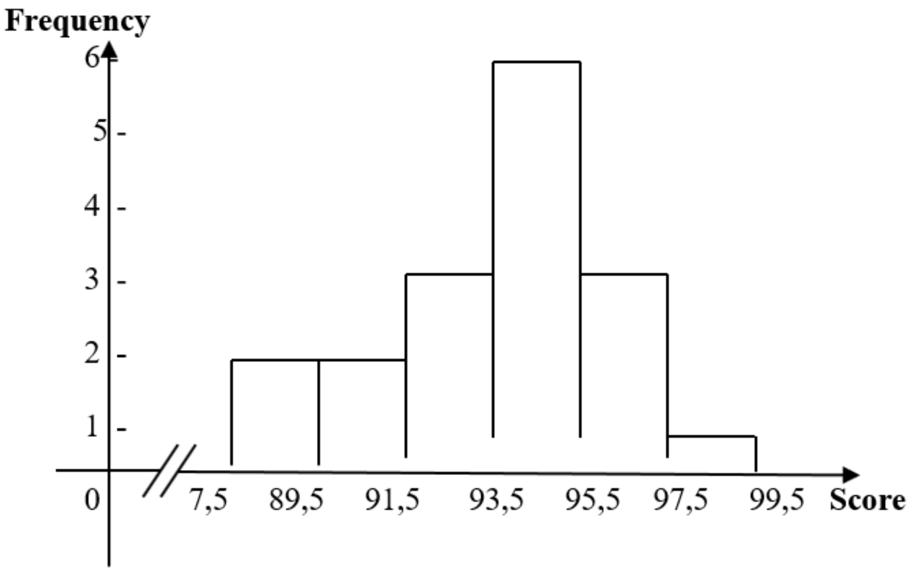

Figure 7.
Histogram of Cadet Learning Outcomes with Software Learning Strategy and High Reflex Movement.

3.8. The Results of Learning Cadets' Typing Skills with Software Learning and Low Reflex Movements

Data on the learning outcomes of typing skills of cadets taught with software learning strategies and low reflex movements are known to be mean = 93.03; mode = 93; median = 93; variance = 3.12; standard deviation = 1.76; maximum score = 96; and minimum score = 90. To obtain an overview of the distribution of learning outcome scores, Table 9 is presented.

Table 9.
Results of Typing Skills of Cadets with Software Learning and Low Reflex Movements.

Interval Class	$f_{absolut}$	$f_{relatif}$
90 – 91	3	20.00
92 – 93	6	40.00
94 – 95	5	33.33
96 – 97	1	6.67
Total	15	100

Based on the data in Table 9, it can be explained that with a mean of 93.03 rounded to 93 in the interval class 92 - 93, this means that there are 40.00% of respondents at the class average score, 20.00% below the class average score and 40.00% above the class average score. Furthermore, the histogram is presented as follows.

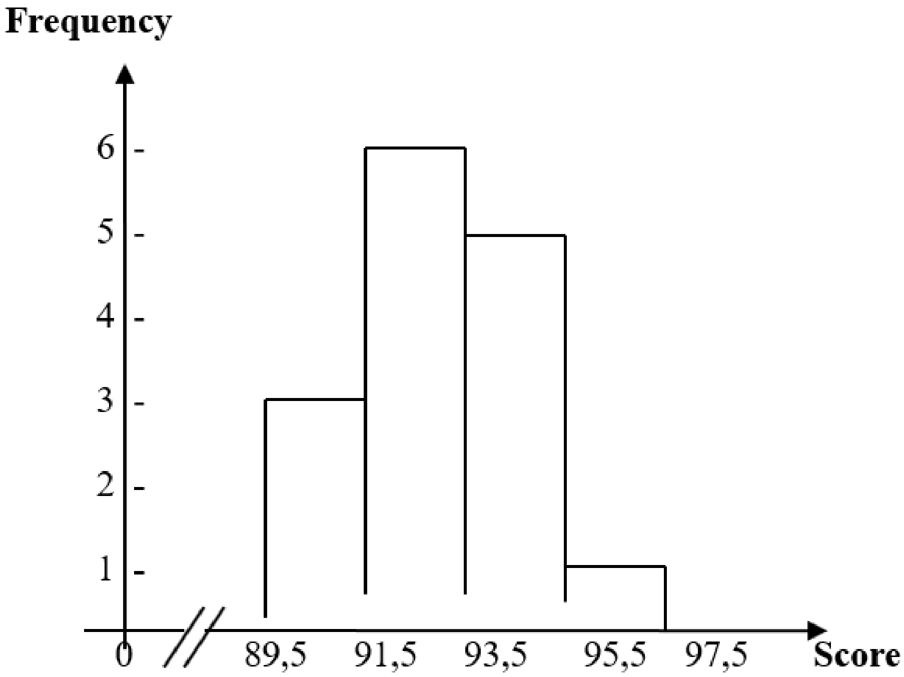

Figure 8.
Histogram of Cadet Learning Outcomes with Software Learning Strategy and Low Reflex Movement

3.9. Testing Condition Analysis

Testing of analysis requirements includes a normality test and a homogeneity test.

3.9.1. Normality Test

The normality test was conducted using the Lilliefors test. A summary of the calculation using the Lilliefors formula can be seen in Table 10.

Table 10.
Summary of Normality Test Analysis.

No	Group	L-observation	L- Table	Results
1	Results of Study Typing Skills of Cadets With Fixed Rhythm Software Strategy	0.1341	0.1591	Normal
2	Results of Study Typing Skills of Cadets With Software Strategy	0.1365	0.1566	Normal
3	Results of Study Typing Skills of Cadets with Reflex Movements Tall	0.1018	0.1456	Normal
4	Results of Study Typing Skills of Cadets with Reflex Movements Low	0.1287	0.1706	Normal
5	Results of Study Typing Skills of Cadets With Fixed Rhythm Software Strategy And Reflex Movement Tall	0.1380	0.1900	Normal
6	Results of Study Typing Skills of Cadets With Fixed Rhythm Software Strategy And Reflex Movement Low	0.2119	0.2490	Normal
7	Results of Study Typing Skills of Cadets With Software Strategy And Reflex Movement Tall	0.1297	0.2060	Normal
8	Results of Study Typing Skills of Cadets With Software Strategy And Reflex Movement Low	0.1755	0.2200	Normal

Normality test of learning outcome data of typing skills of cadets with fixed rhythm software strategy, overall obtained Lilliefors calculated value of 0.1341 while Lilliefors table value with N = 31 and $\alpha = 0.05$ is 0.1591. Thus, it is known that Lilliefors' calculated value is smaller than Lilliefors' table value, which is 0.1341 <0.1591, so it is concluded that the learning outcome data of typing skills of cadets taught with fixed rhythm software strategy is normally distributed.

Normality test of learning outcome data of typing skills of cadets taught with software strategy obtained Lilliefors calculated value of 1365 while Lilliefors table value with N = 32 at $\alpha = 0.05$ is 0.1566. Thus, it is known that Lilliefors' calculated value is smaller than Lilliefors' table value, which is 0.1365 <0.1566, so it is concluded that the learning outcome data of cadets is normally distributed.

The normality test of the learning outcome data of typing skills of cadets with high reflex movements as a whole who were taught with a fixed rhythmic software strategy and software strategy obtained a Lilliefors count value of 0.1018, while the Lilliefors table value with N = 37 at $\alpha = 0.05$ was 0.1456. Thus, it is known that the Lilliefors count value is smaller than the Lilliefors table value, namely 0.1018 <0.1456, so it is concluded that the learning outcome data of the cadets' typing skills are normally distributed.

The normality test of learning outcomes data of typing skills of cadets with low reflex movements taught with fixed rhythmic software learning strategies and software strategies obtained a Lilliefors calculated value of 0.1287, while the Lilliefors table value with N = 26 at $\alpha = 0.05$ is 0.1706. Thus, it is known that the Lilliefors calculated value is smaller than the Lilliefors table value, namely 0.1287 <0.1706, so it is concluded that the learning outcomes data of typing skills of cadets are normally distributed. The normality test of learning outcomes data of typing skills of cadets taught with fixed rhythmic software strategies and high reflex movements obtained a Lilliefors calculated value of 0.1380, while the Lilliefors table value with N = 20 at $\alpha = 0.05$ is 0.1900. Thus, it is known that the Lilliefors calculation value is smaller than the Lilliefors table value, which is 0.1380 <0.1900, so it is concluded that the data on the learning outcomes of typing skills of cadets taught with a fixed rhythm software strategy and high reflex movements are normally distributed. The normality test of the learning outcomes of typing skills of cadets taught with a fixed rhythm software learning strategy and low reflex movements obtained a Lilliefors calculation value of 0.2119, while the Lilliefors table value with N = 11 at $\alpha = 0.05$ is 0.2490. Thus, it is known that the Lilliefors calculation value is smaller than the Lilliefors table value, which is 0.2119 <0.2490, so it is concluded that the data on the learning outcomes of typing skills of cadets taught with a fixed rhythm software strategy and low reflex movements are normally distributed.

The normality test of the learning outcomes data of typing skills of cadets taught with software strategies and high reflex movements obtained a calculated Lilliefors value of 0.1287, while the Lilliefors table value with N = 17 at $\alpha = 0.05$ was 0.2060. Thus, it is known that the calculated Lilliefors value is smaller than the Lilliefors table value, namely 0.1287 < 0.2060, so it is concluded that the learning outcomes data of typing skills of cadets taught with software strategies and high reflex movements are normally distributed. The normality test of the learning outcomes data of typing skills of cadets taught with software strategies and low reflex movements obtained a calculated Lilliefors value of 0.1755, while the Lilliefors table value with N = 15 at $\alpha = 0.05$ was 0.2200. Thus, it is known that the calculated Lilliefors value is smaller than the Lilliefors table value, namely 0.1755 < 0.2200. It is concluded that the learning outcomes data of typing skills of cadets taught using the software strategy as a whole for cadets with low reflex movements are normally distributed.

3.9.2. Homogeneity Test

The homogeneity of variance test was conducted to determine whether the sample variance came from a homogeneous population. The homogeneity test conducted was to compare the variance of the learning outcome data of typing skills between the treatment with a fixed rhythmic software learning strategy and the software learning strategy and reflex movement ability. A summary of the homogeneity test calculations can be seen in Tables 11 and Table 12.

Table 11.
Summary of Homogeneity Test Analysis Using Fisher's Exact Test.

No	Sample Group	F_{count}	$F_{ta\ bel}$	Results
1	Cadets Who Are Taught with Fixed Rhythm Software Strategy and Software Strategy	1. 54	1. 82	Homogeneous
2	Reflex Movement Height and Reflex Movement Low	1. 06	1. 93	Homogeneous

Table 12.
Summary of Homogeneity Test Analysis Using Bartlett's Test.

No	Sample Group	χ^2 count	χ^2 years old	Results
1	Interaction Learning Strategies and Reflex Movements	4.62	7.8 1	Homogeneous

From the table, it can be seen that the homogeneity test of the learning outcome data of the sample group taught with a fixed rhythm software learning strategy and a software learning strategy obtained a calculated F value of 1.54 while the F -table value = 1.82 at α= 0.05 with a numerator dk of 30 and a denominator dk of 31. Thus, it is known that the calculated F value is smaller than the F - table value, namely 1.54 <1.83, so it is concluded that the two sample groups have relatively the same variance (homogeneous).

The homogeneity test of the learning outcome data of the sample group of cadets with high reflex movements and low reflex movements obtained a calculated F value of 1.06 while the F -table value = 1.93 at α= 0.05 with a numerator dk of 36 and a denominator dk of 25. Thus, it is known that the calculated F value is smaller than the F - table value, namely 1.06 <1.93, so it is concluded that the two sample groups have relatively the same variance (homogeneous).

The homogeneity test of the interaction between learning strategies and reflex movements uses the Bartlett formula. Based on the calculation of the Bartlett formula, the value of χ^2 counts is 4.62, while the value of $\chi^{2\ \text{counts is}}$ 4.62. table (α=0.05, 3) = 7.81. Based on the data, it can be seen that the price of χ^2 counts < χ^2 tables. Thus, it can be concluded that the data on the Taruna learning outcome scores come from homogeneous variations.

3.9.3. Hypothesis Test

Testing of the first, second, and third research hypotheses was carried out using a 2 x 2 factorial variance analysis. The data used in testing the hypotheses are shown in Table 13.

Table 13.
Learning Outcome Data for Hypothesis Testing

Strategy of Learning / Reflexes Movement	Software of Fix Rhythmic	Software only	Total
High	n = 20 ∑X = 1918 $\sum X^2 =$ 184065 $\overline{X}$ = 95.90 s = 2.60	n = 17 ∑X = 1590.5 $\sum X^2 =$ 148934.25 $\overline{X}$ = 93.55 s = 2.83	n = 37 ∑X = 3508.5 $\sum X^2 =$ 332999.25 $\overline{X}$ = 94.82 s = 2.92
Low	n = 11 ∑ X = 1021.5 $\sum X^2 =$ 94898.75 $\overline{X}$ = 92.86 s = 1.96	n = 15 ∑X = 1395.5 $\sum X^2 =$ 129871.75 $\overline{X}$ = 93.03 s = 4.29	n = 26 ∑X = 2417 $\sum X^2 =$ 225518.5 $\overline{X}$ = 93.11 s = 2.83
Total	n = 31 ∑ X = 2939.5 $\sum X^2 =$ 278963.75 $\overline{X}$ = 94.82 s = 2.78	n = 32 ∑ X = 2980 $\sum X^2 =$ 277668 $\overline{X}$ = 93.12 s = 2.23	n = 63 ∑X = 5919.5 $\sum X^2 =$ 556631.75 $\overline{X}$ = 94.05 s = 2.51

Table 14.
Summary of 2 x 2 Factorial ANOVA.

Source Variation	dk	Jk	Rjk	F- count	F- table (1.68) (α= 0.05)
Learning strategies	1	56.93	56.93	11.09	4.004
Reflex Movement	1	45.38	45.38	8.84	
Interaction	1	28.21	28.21	5.49	
Error	59	303.14	5.13		
Total	62	433.66	-		

Based on the summary above, the hypothesis testing will be detailed as follows:

3.9.4. First Hypothesis

The first hypothesis test states that the learning outcomes of typing skills of cadets taught with rhythmic software learning strategies remain higher than the learning outcomes of cadets taught with traditional software learning strategies. The statistical hypothesis is:

Ho : $\mu A1 = \mu A2$
Ha : $\mu A1 > \mu A2$

Based on the calculation of factorial ANOVA 2 x 2, the F-count = 11.09 was obtained while the F-table value = 4.004 for dk (1.59) and the level of significance $\alpha = 0.05$. It turns out that the F-count value = 11.09 > F-table = 4.004, so the hypothesis test rejects H_0 and accepts H_1. Thus, it can be concluded that the learning outcomes of the typing skills of cadets taught with a fixed rhythm software learning strategy are better than the learning outcomes of typing skills of cadets taught with a software strategy that can be accepted and proven empirically. This can also be seen from the average learning outcomes of typing skills of cadets taught with a fixed rhythm software learning strategy ($\mu = 94.82$), which is higher than the learning outcomes of typing skills of cadets taught with a software learning strategy ($\mu = 93.12$).

3.9.5. Second Hypothesis

The second hypothesis test is that the learning outcomes of typing skills of cadets with high reflex movements are higher than those of cadets with low reflex movements. The statistical hypothesis is:

Ho : $\mu B1 = \mu B2$
Ha : $\mu B1 > \mu B2$

Based on the calculation of factorial ANOVA 2 x 2, the F-count = 11.09 was obtained while the F-table value = 4.004 for dk (1.59) and the level of significance α= 0.05. It turns out that the F-count value = 11.09 > F-table = 4.004 so the hypothesis test rejects Ho and accepts Ha. Thus, it can be concluded that the learning outcomes of the typing skills of cadets taught with a fixed rhythm software learning strategy are better than the learning outcomes of typing skills of cadets taught with a software strategy that can be accepted and proven empirically. This can also be seen from the average learning outcomes of typing skills of cadets taught with a fixed rhythm software learning strategy ($\overline{X}$ = 94.82) which is higher than the learning outcomes of typing skills of cadets taught with a software learning strategy ($\overline{X}$ = 93.12).

3.9.6. Third Hypothesis

The third hypothesis test is: there is an interaction between learning strategies and reflex motor skills in influencing the learning outcomes of typing skills. The statistical hypothesis is:

Ho : A >< B = 0

Ha : A >< B ≠0w

Based on the calculation of factorial ANOVA 2 x 2, the F-count = 5.49 was obtained while the F-table value = 4.004 for dk (1.59) and the real level α = 0.05. It turns out that the F-count value = 5.49 > F-table = 4.004, so the H_0 hypothesis is rejected and H_1 is accepted. Thus, it can be concluded that there is an interaction between learning strategies and reflex movements in influencing the learning outcomes of typing skills, which can be accepted and empirically proven in this study.

3.9.7. Scheffe Test

After the hypothesis test was carried out, further testing was carried out with the Scheffe test. A summary of the Scheffe test calculations can be seen in Table 15.

Table 15.
Summary of Scheffe Test.

Hypothesis Statistics		**F** - count	**F** - table (3.76) (α= 0.05)
HO : $\mu_{11} = \mu_{12}$	Ha: $\mu_{11} > \mu_{12}$	4.27	2.7 64
HO : $\mu_{11} = \mu_{21}$	Ha: $\mu_{11} > \mu_{21}$	4.28	2.7 64
HO : $\mu_{11} = \mu_{22}$	Ha: $\mu_{11} > \mu_{22}$	5.12	2.7 64
HO : $\mu_{12} = \mu_{21}$	Ha: $\mu_{12} > \mu_{21}$	0.92	2.7 64
HO : $\mu_{12} = \mu_{22}$	Ha: $\mu_{12} > \mu_{22}$	0.86	2.7 64
HO : $\mu_{21} = \mu_{22}$	Ha: $\mu_{21} > \mu_{22}$	0.22	2.7 64

Information:

μ_{11} = Average result learning cadets taught with rhythmic software learning strategy, fixed and moving reflex tall

μ_{12} = Average learning outcomes of cadets taught using software learning strategies and high reflex movements

μ_{21} = Average learning outcomes of cadets taught using a fixed rhythm software learning strategy and low reflex movements

μ_{22} = Average learning outcomes of cadets taught using software learning strategies and low-reflex movements

Overall, the results of the Scheffe test show that of six combinations of the average comparison of learning outcomes of typing skills, based on Table 16, 3 combinations show significant results. The results of the further test above show that there is an interaction between learning strategies and reflex movements on learning outcomes of typing skills and reflex movements, which can be shown in the following diagram:

3.10. Average Learning Outcomes

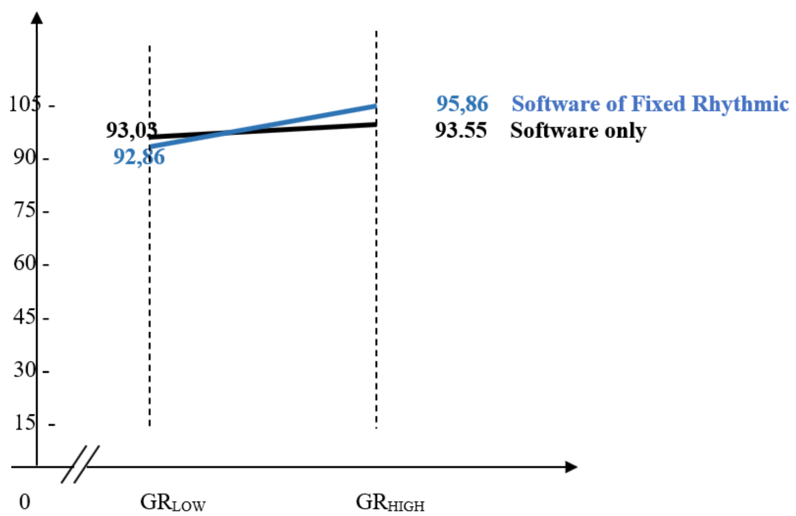

Figure 9.
Interaction of Learning Strategies and Reflex Movements.

4. Discussion

In the previous presentation, it was known that overall, the average learning outcomes of typing skills taught with a fixed rhythm software learning strategy ($\overline{X}$ = 94.82) were higher than the average learning outcomes of cadets taught with a software learning strategy ($\overline{X}$ = 93.12). This shows that the fixed rhythm software learning strategy has proven to be effective in improving the overall learning outcomes of cadets' typing skills, both for groups of cadets with high reflex movements and groups of cadets with low reflex movements. This is by the purpose of learning with rhythmic software by providing a constant rhythmic tone during typing training, which aims to make cadets' attention to the keys that are pressed more focused so that by adding a metronome as a complementary tool for computer *software,* it can be assumed that it will be able to accelerate cadets' mastery of typing skills. The results of the study showed that software media can present learning objects in the form of rare and dangerous objects or events in the classroom. Thus, it can be interpreted that the fixed rhythm software learning strategy is more effective in improving learning outcomes of typing skills without paying attention to cadets' reflex movements.

This can happen because, in learning that applies a rhythmic software learning strategy, cadets can type according to the tutorial guide, but the typing tempo follows the tone produced by the metronome [24]. In addition, the desire to speed up the completion of an exercise due to having memorized the keys will be controlled by the procedure that must be followed through the tempo of the metronome rhythm. Meanwhile, when only using software, this is difficult to implement. Cadets will continue to type as they please, which will result in continuing to have difficulty remembering keys that are not yet memorized. The findings of this study can explain that 10-finger typing skills through the use of *demonstration* and *problem-based introduction methods* for Cadets in class X of fine arts at SMK Negeri 9 Surakarta, namely that the demonstration and problem-based methods increase Cadets' typing skills by 32.3%.

Other findings show that the average learning outcomes of typing skills of cadets with high reflex movements ($\overline{X}$ = 94.82) overall, both those taught with fixed rhythmic software learning strategies and software learning strategies, are higher than the average learning outcomes of cadets with low reflex movements ($\overline{X}$ = 93.11). This shows that reflex movement abilities without paying attention to the learning strategies applied affect the learning outcomes of cadets' typing skills. For this reason, the role of teaching staff in learning activities is to pay attention to cadets' reflex movements, so that the strategies applied in learning activities are tailored to the characteristics of cadets' reflex movements. This study shows that the abilities needed to develop high-level skill movements include endurance, strength, flexibility, and brain intelligence. These components cause high reflex movements in completing typing skills.

It further observed that in the rhythmic software learning strategy, the average learning outcomes of typing skills of cadets with high reflex movements ($\overline{X}$ = 95.90) are higher than the learning outcomes of cadets with low reflex movements ($\overline{X}$ = 92.86). In the software learning strategy, the average learning outcomes of typing skills of cadets with high reflex movements ($\overline{X}$ = 93.55) are higher than the learning outcomes of typing skills of cadets with low reflex movements ($\overline{X}$ = 93.03). This shows that reflex movements are significant in differentiating the learning outcomes of cadets' typing skills, where the learning outcomes of typing skills of cadets with high reflex movements, both those taught with the rhythmic software learning strategy and the software learning strategy, are higher than the learning outcomes of typing skills with low reflex movements.

The research results showed all the research hypotheses, namely: (1) the learning outcomes of typing skills of cadets taught using a fixed rhythm software learning strategy were higher than the results of learning the typing skills of cadets who were taught using other software learning strategies; (2) the results of learning the typing skills of cadets with high reflex movements were higher than the results of learning the typing skills of cadets with low reflex movements; and (3) there is an interaction between learning strategies and reflex movements in influencing the results of learning the typing skills of cadets, which can be accepted.

The first hypothesis is that the learning outcomes of cadets taught with a fixed rhythm software learning strategy are higher than the learning outcomes of cadets taught with a fixed rhythm software learning strategy. This is understandable because through a fixed rhythm software learning strategy, cadets can be encouraged to type according to the tutorial guide, but the typing tempo follows the tone produced by the metronome. In addition, the desire to speed up the completion of an exercise due to having memorized the keys will be controlled by the procedure that must be followed through the tempo of the metronome rhythm. When only using software, this is difficult to implement. Cadets will continue to type as they please, which will result in continuing to have difficulty remembering keys that they have not memorized. Therefore, the role of teaching staff in rhythmic software learning strategies remains more dominant as facilitators who direct cadets to discover and construct their knowledge. Learning software media can introduce, improve, enhance, and clarify the understanding of concepts and facts. Software media can help overcome the limitations of the human senses**.** Software media can overcome the constraints of space and time limitations. Software media can present learning objects in the form of rare and dangerous objects or events in the classroom.

The second hypothesis test shows that the learning outcomes of typing skills of cadets with high reflex movements are higher than the learning outcomes of those with low reflex movements. These results prove that reflex movements are significant in differentiating learning outcomes of typing skills. From the results of the overall data analysis, it was obtained that the average learning outcomes of typing skills of cadets with high reflex movements were higher than the learning outcomes of typing skills of cadets with low reflex movements. This indicates that cadets with high reflex movements, on average, have higher learning outcomes of typing skills compared to cadets with low reflex movements. Thus, cadets with high reflex movements can better understand and master typing skills compared to cadets with low reflex movements.

The third hypothesis test shows that there is an interaction between learning strategies and reflex movements in influencing the learning outcomes of cadets' typing skills. When viewed, the average learning outcomes in the group of cadets with high reflex movements and taught with a rhythmic software learning strategy are still better than the average learning outcomes of the group of cadets with high reflex movements and taught with a software learning strategy. Then, the average learning outcomes of typing skills in the group of cadets with low reflex movements and taught with a rhythmic software learning strategy are still lower than the average learning outcomes of typing skills in the group of cadets with low reflex movements and taught with a software learning strategy. This means that for the group of cadets with low reflex movements, it is better to be taught using a software learning strategy compared to using a fixed rhythmic software learning strategy. Thus, it can be concluded that learning strategies and reflex movements significantly influence the learning outcomes of cadets' typing skills.

Furthermore, based on further testing, of the six combinations that occurred, there were six combinations that occurred, namely: (1) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements ($\overline{X}$ = 95.90) were higher than the average learning outcomes of cadets taught with a high reflex software learning strategy (= 93.55) showing significant results, (2) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements (= 95.90) were higher than the average learning outcomes of cadets taught $\overline{X}$ with a fixed rhythm software learning strategy and low reflex movements (= 92.86) showing significant results, (3) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements ($\overline{X}$ = 95.90) were higher than the average learning outcomes of cadets taught with a low reflex software learning strategy (= 93.03) showing significant results, (4) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements ($\overline{X}$ = 93.03) showing significant results, (5) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements (= 93.03) showing significant results, (6) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements ($\overline{X}$ = 93.03) showing significant results, (7) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements (= 93.03) showing significant results, (8) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and high reflex movements (= 93.03) showing significant results, (9) the results of further testing on the average learning outcomes of cadets taught with a fixed rhythm software learning strategy and low reflex movements ($\overline{X}$ = 92.86) showing significant results. Further testing of the average learning outcomes of cadets taught using software learning strategies and high reflex movements ($\overline{X}$ = 93.55) was higher than the average learning outcomes of cadets taught using software learning strategies with a fixed rhythm and low reflex movements ($\overline{X}$ = 92.86) showed insignificant results, (5) the results of further testing of the average learning outcomes of cadets taught using software learning strategies with a high reflex movement ($\overline{X}$ = 93.55) were higher than the average learning outcomes of cadets taught using software learning strategies with a low reflex movement ($\overline{X}$ = 93.03) showed insignificant results and (6) the results of further testing of the average learning outcomes of cadets taught using software learning strategies with a fixed rhythm and low reflex movements ($\overline{X}$ = 92.86) were lower than the average learning outcomes of cadets taught using software learning strategies with a low reflex movement ($\overline{X}$ = 93.03) showed insignificant results.

Further tests conducted on the six combinations above showed three combinations that showed insignificant results, namely: (1) the results of further tests on the average learning outcomes of cadets taught with a software learning strategy and high reflex movements ($\overline{X}$ = 93.55) were higher than the average learning outcomes of cadets taught with a software learning strategy with a fixed rhythm and low reflex movements ($\overline{X}$ = 92.86) showed insignificant results, (2) the results of further tests on the average learning outcomes of cadets taught with a software learning strategy and high reflex movements ($\overline{X}$ = 93.55) were higher than the average learning outcomes of cadets taught with a software learning strategy and low reflex movements ($\overline{X}$ = 93.03) showed insignificant results, and (3) the results of further tests on the average learning outcomes of cadets taught with a software learning strategy with a fixed rhythm and low reflex movements ($\overline{X}$ = 92.86) were lower than the average learning outcomes of cadets taught with a software learning strategy and low reflex movements ($\overline{X}$ = 93.03) showed insignificant results.

From the results of this study, it can be said that learning strategies must be adjusted to the characteristics of the cadets, namely reflex movements and the subject matter to be delivered. The selection of learning strategies or the ability to design appropriate learning is needed and must be adjusted to the characteristics of the cadets so that it will help in determining learning strategies, learning theories, and learning media that are suitable for use. This is done so that the lessons delivered can attract the attention of students and every lesson hour does not feel boring.

5. Conclusion

First, there is a difference in the average skill results of cadets taught using a fixed rhythm software learning strategy ($\overline{X}$ = 94.82) is higher than the average learning outcomes of cadets taught using software learning strategies ($\overline{X}$ = 93.12). Thus, the rhythmic software learning strategy remains more effective when applied in learning typing skills to improve the learning outcomes of cadets without paying attention to differences in reflex movements.

Second, the average skill results of cadets with high reflex movements who were taught using a fixed rhythm software learning strategy and a rhythmic software learning strategy ($\overline{X}$ = 94.82) were higher compared to the average learning outcomes of cadets with low reflex movements ($\overline{X}$ = 93.11).

Third, there is an interaction between learning strategies and reflex movements, in which cadets with high reflex movements are better taught using a fixed rhythm software learning strategy compared to using a software learning strategy, while cadets with low reflex movements are more appropriate taught using software learning strategies compared to fixed rhythm software learning strategies.

5.1. Limitations

The implementation of this research has been attempted as well and as perfectly as possible by using scientific method procedures, however, it does not rule out the possibility of limitations, namely:

First, the lack of understanding among the teaching staff regarding the subject matter shows insignificant results when implementing the steps of the fixed rhythm software learning strategy. Overcoming this issue can be achieved by providing a fixed rhythm software learning guidebook, offering a learning design and treatment materials for fixed rhythm software, and conducting discussions to address the difficulties that arise.

Second, this research was only conducted in one fixed rhythm software learning class and one class in software learning, so this research cannot be generalized to a wider scope unless the characteristics of the cadets and their learning materials align with the characteristics of this research.

Third, the research instrument only measures the learning outcomes obtained by the cadets but has not been able to measure the learning process carried out by the cadets toobtain overall learning outcomes. For this reason, this research can be combined with more in-depth research through qualitative methods so that the cadets' learning process can be recorded properly.

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