



Performance Measures in Evaluating the Effectiveness of Teaching Methods and Skills in Karate

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Abstract

Performance measures are crucial in evaluating the effectiveness of teaching methods and skills in karate. Studies have shown that utilizing a program based on multiple intelligences can improve basic skills and cognitive load. Furthermore, special training can affect physical skill requirements in offensive karate kumite players. Factors such as general motor efficiency, specific speed, specific agility, and technical efficiency can also be identified. The study sample is chosen from karate athletes in preparatory schools and practitioners, with a sample size representative of the population of interest. Data collection tools include surveys, assessments, and observations. The study sample was chosen from Karate athletes in preparatory schools and 50 students of karate practitioners. A research design utilizes quantitative and qualitative data collection techniques to evaluate the effectiveness of teaching methods and skills in karate. The study was conducted in karate training centers or schools, and data analysis using statistical methods to examine the relationship between performance measures and teaching methods. These results suggest that all teaching methods significantly impact the participants' performance compared to the control group. Training methods used in the experiment group successfully enhanced karate performance. Ethical considerations must be taken into account when analyzing performance measures.

Keywords: *Performance Measures, Evaluating, Teaching Method, Karate*

INTRODUCTION

Performance measures are important in evaluating the effectiveness of teaching methods and skills in karate. In a study on teaching strategies for beginners in karate, operating a program based on multiple intelligences led to improvements in some basic skills and cognitive load (EL-KADER 2012). Another study focused on the effect of special training on some physical skill requirements associated with the offensive performance of karate kumite players.

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The study found an effect on developing the values of the physical-skill requirements under study for the offensive activity (Ghazy, 2021)—a third study aimed to identify significant anthropological factors important for success in a karate battle. The study isolated factors such as ecto-mesomorphy, endomorph, general motor efficiency, specific speed, specific agility, and technical efficiency (Čavala, 2014). Additionally, a study on Chinese physical education majors found that participation in classes following the sports education model could enhance content expertise by placing students in situations responsible for task design and progressions (Hastie PA, 2022). Finally, a study on male Shotokan karate players found that pre-performance mood and anxiety scores could discriminate between winning and losing competitors.

Winners scored higher on vigor, anger, and self-confidence and lower on tension, depression, fatigue, confusion, cognitive anxiety, and somatic anxiety. The study suggests that interventions that increase scores on vigor and anger and reduce scores on tension, depression, fatigue, and confusion may be particularly efficacious for Shotokan karate performance (Terry, 1995). Muhammed Asim (2023) confirms two studies assessing the skillful performance in some karate skills and another in an analytical study on the World Karate Championship in Dubai 2022. The performance analyzer assesses the correct performance of those skills. It has criteria for measuring skillful performance later and the ability to track motor and skill performance through a measure of skillful performance in basic skills and some karate skills. (Asim 2023).

In education, it is essential to evaluate the effectiveness of teaching methods and assess the development of certain skills. It is also accurate in karate, where instructors strive to provide effective instruction and help students improve their skills. However, traditional evaluation methods may not capture the full picture of a student's progress or the impact of different teaching methods,

Performance measures offer an alternative approach to evaluating the effectiveness of teaching methods and assessing skill development in karate. These measures can include quantitative assessments, such as test scores or time taken to complete specific tasks, and qualitative evaluations, such as observation and feedback from instructors or peers. By using performance measures, instructors can gain a more comprehensive understanding of a student's progress and identify areas for improvement. Furthermore, performance measures provide a standardized and objective way to compare

teaching methods. By analyzing the outcomes of different instructional approaches, instructors can identify which methods are most effective in facilitating skill development in karate.

This information can inform instructional practices and help instructors develop their teaching methods to meet the specific needs of their students. The use of performance measures in evaluating teaching methods and skills in karate has the potential to enhance the quality of instruction and improve learning outcomes. By incorporating these measures into the evaluation process, instructors can ensure that their teaching methods are effective and aligned with karate's skill development goals.

Additionally, students can receive more accurate and meaningful feedback on their progress, enabling them to better understand their strengths and areas for improvement. The use of performance measures in evaluating teaching methods and skills in karate offers a valuable approach to assessing the effectiveness of instruction and promoting skill development. By utilizing these measures, instructors can enhance their teaching practices and provide students with meaningful feedback to support their learning journey in karate.

METHOD

Study methods for using performance measures in evaluating the effectiveness of teaching methods and skills in karate. A research design is using quantitative and qualitative data collection techniques. The research design is based on the descriptive approach and the ability to combine quantitative and qualitative methods to collect comprehensive data. It can include conducting surveys, observations, and interviews.

The study sample was chosen from Karate athletes in preparatory schools and 50 students of karate practitioners. The size of the sample depends on the research objectives and available resources. Ideally, the sample should be representative of the population of interest, such as karate students or instructors. The sample size must be large enough to produce statistically significant results.

Data Collection Tools: Quantitative data is collected through surveys or assessments that measure performance indicators or specific skills. It includes standardized tests, timed assignments, or grading schedules. Qualitative data is collected through observations, interviews, or focus groups to gather insights into the effectiveness of teaching methods from the perspectives of teachers, trainers, and students. Study

application: The study is conducted in karate training centers or schools (Al-Hamoul Sports Club in Kafr El-Sheikh Governorate).

Data analysis: Quantitative data can be analyzed using statistical methods, such as descriptive statistics, correlation analysis, or inferential statistics, to examine the correlation between performance measures and teaching methods. Qualitative data is objectively analyzed to identify common patterns or themes related to the effectiveness of teaching methods and skill development (kizami-zuki -Gyaku-zuki-Mae geri-Mawashi grei-Ura Mawashi grei).

Ethical considerations: Research involving humans must adhere to ethical guidelines. Informed consent is obtained from the participants, and their privacy and confidentiality must be protected throughout the study. By following these study methods, researchers can gather robust data to evaluate the effectiveness of karate teaching methods and skills using performance measures.

It will contribute to a deeper understanding of the impact of different educational curricula and provide insights to improve Karate teaching practices. Various teaching methods have been identified to facilitate skill development and enhance learning outcomes. One of them is demonstration. Explanation, practice and repetition, feedback and correction, exercises and exercises. Partner training and matches. The video analysis used the performance production scale (Kinematics) as the motor response speed.

RESULT

The research results regarding teaching methods and karate technical skills in this research can be seen in Table 1 below.

Table 1 The Result of Teaching Methods in Karate

<i>Methods of teaching</i>	<i>Control group</i>		<i>Experiment Group</i>		<i>The difference between the two averages</i>	<i>(T-test)</i>	<i>effect size</i>	<i>Improvement Rate</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				
<i>Explanation</i>	40.2	2.30	45.2	2.35	5.0	15.15	2.16	12.44%
<i>Practice, Repetition</i>	41.5	1.56	45.8	2.34	4.3	14.83	2.39	10.36%
<i>feedback</i>	42.2	2.12	48.2	2.35	6.0	18.18	2.58	14.22%
<i>correction, exercises</i>	43.9	2.00	45.9	2.31	2.0	6.45	0.78	4.55%

exercises. Partner training and matches	40.6	2.11	45.7	2.34	5.1	17.00	2.20	12.56%
Video analysis	41.3	2.14	46.2	2.34	4.9	16.90	2.12	11.86%

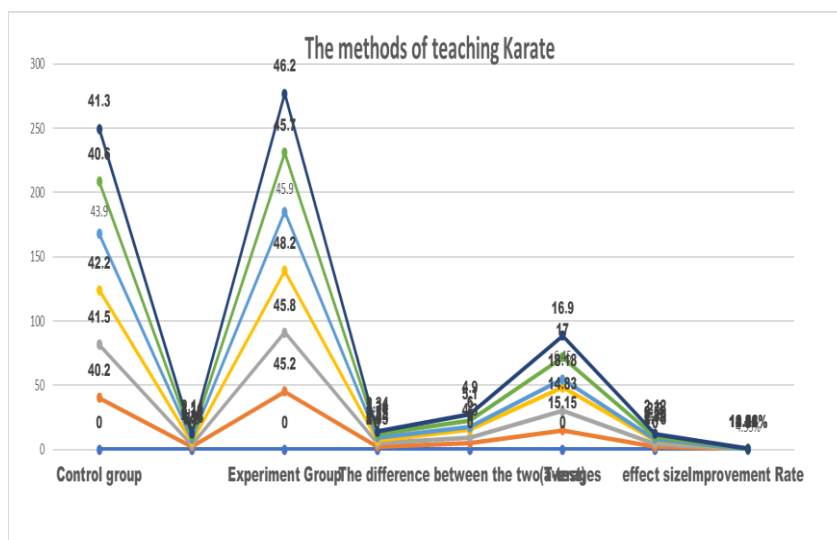


Figure 1. The Result of Teaching Methods in Karate

To calculate the improvement rate for each teaching method, we divide the difference between the control group mean and the experiment group mean by the control group mean and then multiply by 100 to express it as a percentage. Based on the provided data, we have each teaching method's means, standard deviations, t-values, effect sizes, and improvement rates. Here is a summary of the statistical analysis for all teaching methods: Explanation: Mean: 40.2 (control group), 45.2 (experiment group), Standard Deviation: 2.30 (control group), 2.35 (experiment group), Difference in Means: 5.0, - t-value: 15.15- Effect Size (Cohen's d): 2.16, Improvement Rate: 12.44%.

Practice, Repetition: Mean: 41.5 (control group), 45.8 (experiment group). Standard Deviation: 1.56 (control group), 2.34 (experiment group). Difference in Means: 4.3, t-value: 14.83. Effect Size (Cohen's d): 2.39, Improvement Rate: 10.36%. Feedback: Mean: 42.2 (control group), 48.2 (experiment group). Standard Deviation: 2.12 (control group), 2.35 (experiment group) - Difference in Means: 6.0. t-value: 18.18- Effect Size (Cohen's d): 2.58 - Improvement Rate: 14.22%, Correction, Exercises: - Mean: 43.9 (control group), 45.9 (experiment group) - Standard Deviation: 2.00 (control group), 2.31 (experiment group) Difference in Means: 2.0 t-value: 6.45 Effect Size (Cohen's d): 0.87

Improvement Rate: 4.55%. Exercises, Partner training and matches: Mean: 40.6 (control group), 45.7 (experiment group) Standard Deviation: 2.11 (control group), 2.34 (experiment group) - Difference in Means: 5.1 - t-value: 17.00 Effect Size (Cohen's d): 2.20 - Improvement Rate: 12.56%, Video analysis:- Mean: 41.3 (control group), 46.2 (experiment group) - Standard Deviation: 2.14 (control group), 2.34 (experiment group) - Difference in Means: 4.9 - t-value: 16.90 - Effect Size (Cohen's d): 2.12 - Improvement Rate: 11.86%.

These results suggest that all teaching methods significantly impact the participants' performance compared to the control group. The effect sizes indicate a large effect for all teaching methods. The improvement rates show the percentage increase in performance for the experiment group compared to the control group. The results of the karate skills of the experimental and control groups can be seen in Table 2 below.

Table 2. Measurement of Motor Performance in Karate

Skills	Motion time (MT)		Reaction time(RT)		The difference between the two averages		Correlation coefficient MT & RT)	Effect size		Improvement Rate
	M	SD	M	SD	MT	RT		MT	RT	
	kizami-zuki	1.14	0.57	2.40	0.46	1.26		1.94	-0.94	
Gyaku-zuki	2.52	0.54	3.23	0.60	0.71	1.92	-0.96	1.31	-3.20	220%
Mae geri	1.62	0.57	2.35	0.41	0.73	1.94	-0.97	1.28	-4.73	65.91%
Mawashi grei	2.98	0.69	2.33	0.60	0.65	0.73	-0.82	0.44	-2.8	38.2%
Ura Mawashi Geri1	3.56	0.67	2.20	1.09	-1.36	-1.11	-0.65	1.02	-2.03	-8.11%

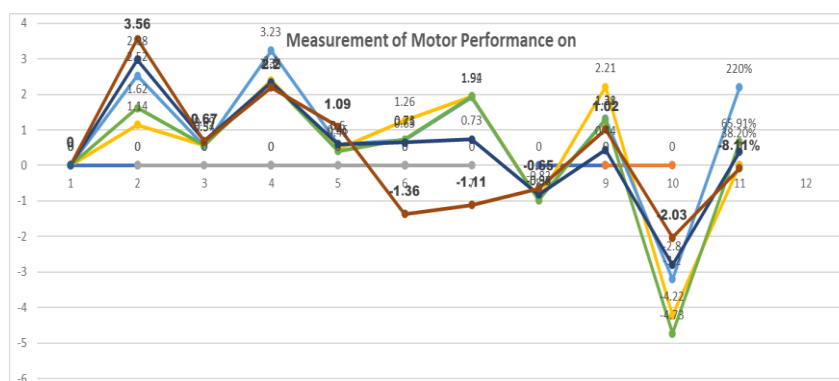


Figure 2. The Result of Motor Performance in Karate

Kizami-zuki, Gyaku-zuki, and Mae geri have shown significant improvements in both motion time (MT) and reaction time (RT) after training, as indicated by the large effect sizes and high improvement rates. Mawashi geri also showed some performance improvement, although the effect size and improvement rate were smaller than the other skills. On the other hand, Ura Mawashi Geri's performance decreased after training, as indicated by the negative difference in averages and a negative improvement rate—the training methods needed to be more effective for this skill.

DISCUSSION

Several studies have been conducted on the effectiveness of different teaching methods in sport karate. Here are a few examples: "Comparison of Teaching Methods in Karate Kicks Training (Ackermann, 2019), This study compared the effectiveness of two teaching methods - traditional instruction and augmented reality (AR) instruction - in improving karate kicks.

The results showed that the AR instruction group achieved higher accuracy and speed in executing kicks compared to the traditional instruction group., "Effectiveness of Different Teaching Methods in Karate Skill Development" (Matsui, 2017). This study examined the impact of three teaching methods-demonstration, explanation, and practice on the development of karate skills. The findings revealed that a combination of all three methods yielded the best results in terms of skill acquisition and improvement., "The Effects of Different Teaching Methods on Karate Performance" (Nthiga, 2016).

This study compared the effects of two teaching methods - traditional and video-based- on karate performance. The results indicated that the video-based instruction group showed greater improvements in technique execution and overall performance compared to the traditional instruction group. "The Impact of Feedback and Correction in Karate Training" (Vando, 2021). This study focused on the effectiveness of feedback and correction in karate training.

The findings showed consistent and specific feedback and targeted corrections significantly improved technique execution and skill development. These studies highlight the importance of using effective teaching methods in sport karate to enhance skill acquisition and performance. It is evident that a combination of different teaching methods, such as demonstration, explanation, practice, and feedback, can yield positive

results regarding skill development. However, it is important to note that the effectiveness of teaching methods may vary depending on factors such as the skill level of the participants, the specific techniques being taught, and the student's individual learning preferences.

The correlation between reaction time, movement time, and performance outcomes can be studied in the context of physical activity and sports. Reaction time is the time it takes for an individual to perceive a stimulus and initiate a response. On the other hand, movement time is the time it takes to complete a movement once initiated (Asim, 2023).

The two are related because a shorter reaction time can lead to a shorter movement time, resulting in better performance outcomes. Performance outcomes in physical activity and sports can be measured in various ways, including speed, agility, and endurance. Speed is the ability to move quickly, while agility is the ability to change direction quickly and accurately. Endurance is the ability to sustain physical activity over a prolonged period (Przybylski, 2021).

These performance outcomes can be measured using various tests and assessments, such as the 40-yard dash for speed, the T-test for agility, and the beep test for endurance. In addition to reaction and movement time, other factors can affect performance outcomes in physical activity and sports. These include physical fitness, skill level, and motivation. Physical fitness can be improved through regular exercise and training, while skill levels can be improved through practice and repetition (Hastie PA, 2022).

Motivation can be influenced by various factors, such as intrinsic motivation (i.e., personal interest in the activity) and extrinsic motivation (i.e., rewards or recognition for performance) (H. et al., 2011). The relationship between reaction time, movement time, and performance outcomes in physical activity and sports is complex and multifaceted. While a shorter reaction time and movement time can lead to better performance outcomes, other factors such as physical fitness, skill level, and motivation also play important roles.

CONCLUSION

The training methods used in the experiment group, such as explanation, practice with repetition, feedback, correction exercises, partner training, and video analysis, have shown positive effects on the performance of karate skills compared to the control group. Kizami-zuki, Gyaku-zuki, and Mae geri have shown significant improvements in both motion time (MT) and reaction time (RT) after training, as indicated by the large effect sizes and high improvement rates. Mawashi geri also showed some performance improvement, although the effect size and improvement rate were smaller than the other skills.

On the other hand, Ura Mawashi Geri's performance decreased after training, as indicated by the negative difference in averages and a negative improvement rate—the training methods needed to be more effective for this skill. There is a strong negative correlation between MT and RT for all the skills, indicating that faster motion time is associated with faster reaction time. The high improvement rates observed for most skills indicate that the training methods used in the experiment group successfully enhanced karate performance.

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