

# The Development of Kumite Match Statistical Analysis Table in Karate

Danardono<sup>1</sup>, Silvia Diar Malista<sup>1</sup>

<sup>1</sup>*Sport Coaching Department, Universitas Negeri Yogyakarta, Jl. Colombo No. 1, Yogyakarta, Indonesia*

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**Abstract:** This research aimed to produce a web-based statistical analysis system of kumite match in karate and its manual book. This media was developed using PHP programming language (Hypertext Preprocessor Program). The developed media contained material on attack techniques in kumite category. This research used Research and Development (R & D) method specifically the research procedures from Sugiyono. Validation by material experts and media experts used questionnaire as the instrument. The product trial was comprised of two stages: small group trial and large group trial. The subjects for small group trial consisted of five people while large group trial consisted of 10 people. The small group trial involved trainers located in the Kartasura area of Sukoharjo District. Large group trial involved the Lemkari school coach of Sukoharjo district. The result of the research showed the quality of product validated by material expert which was categorized as "Very Good" with the average score of 97.14%. The validation result by the media expert was categorized as "Very Good" with the average score of 86.425%. The product quality of small group trial result was considered "Very Good" with average score of 92.88%. Lastly, the product quality of the large group trial was categorized as "Very good" with an average score of 94.44%. Based on the result of this research, it can be concluded that the web-based statistical analysis system of karate sport kumite match media was feasible to be used in karate class/kumite category activities and simulation of the match during practice.

## 1 INTRODUCTION

Karate is one of world-renowned sport branches. It is evident since Karate takes part in every national to international events such as: PON, Asean Games, and Sea Games. The existence of karate in every event entices community interest from children up to adults thus demands proper facilities for it to be held.

Karate is a Japanese martial art that has flourished in Indonesia since a long time ago. Karate is also a performance sport held in every regional, national and international competition. Karate in Indonesia turns out to have a quite large audience. This is apparent from the establishment of various karate organizations of different styles their founders uphold. It also can be seen from the great amount of championship held between institutions ranging from elementary school, middle school to higher education. The championship levels are also available starting between institutions to the world class championships.

Karate features two categories for the championships, kata and kumite. "kata" is a compilation of all basic techniques such as parrying, punching, jerking or thumping and kicking as one definite form while "kumite" is a match between two individuals showing various techniques (Nakayama, 1981). In kumite, karateka learn how to practice the kicking, parrying and attacking techniques diligently with full concentration. Kumite has a point system: punch for 1 point, lower kick (cudhan) for 2 point, and upper kick (Jodhan) for 3 point.

Based on the observations and interviews, karate had not yet possessed a model of analysis system for kumite attacks. The coaches mostly analyze their athletes for kumite through video or the match without knowing the total amount of attack their athletes did during the match. Athletes frequently used unnecessary attacks putting their time and energy into waste during the match. Therefore, the coach needed kumite attacks data analysis for future development of the athlete. This may become the

coach's evaluation for their athletes telling which techniques to improve and assessing their performance.

From that point of view, the researcher tried to help coping this problem and assisted the coaches to analyse their athletes by developing a web-based application called Kumite Match Statistic Analysis Table in Karate.

## 2 RESEARCH METHODS

### 2.1 Type of Research

The type of research used is Research and Development. The main orientation focused on the product being developed. In this research and development, the product being developed is kumite match statistic analysis table in karate.

### 2.2 Research Steps

This research used a method initiated by Sugiyono. There are ten steps to follow in the method. However, the researcher took only seven of them. The steps involve Problem Identification and Potency, Data Collection, Product Design, Design Validation, Design Revision, Product Testing, and Final Product.

### 2.3 Trial Subject

In this research and development, the test subject was categorized into three, Subject-Matter Expert Trial, Small Group Trial, and Large Group Trial. Subject Expert acts as the one who decides whether the manual statistical analysis table in the computer has been tailored to the actual level of theory used or not.

The media expert means the lecturer that excel in media training. The media expert acts as an advisor towards media statistic and aesthetic design.

The test subject in this research and development was determined using simple random sampling method. Simple random sampling is a sampling method that allows any member to have the same opportunity to be picked as the sample or subject member (Sugiyono, 2009).

The trial subjects were coaches from Dojo Lemkari Kartasura and Lemkari school of Sukoharjo. Small Group Trial Subject comprised of five coaches were from Dojo Lemkari Kartasura while coaches from Lemkari school of Sukoharjo became the subject of Large Group Trial.

### 2.4 Method of Data Collection and Research Instrument

The data collection in this research development used a questionnaire method and the questionnaire was used as an instrument.

### 2.5 Types of Data

The data used in this research are both qualitative and quantitative. Quantitative data are in the form of number or written score while qualitative data are in the form of sentence or picture (Mulyatiningsih, 2012). Quantitative data in the form of score were collected using product testing questionnaire. During the product testing, the score was analyzed using descriptive quantitative analysis. The percentage was used to describe the status and then interpreted using qualitative sentences. The scores was analyzed by counting the score obtained from the research divided by the total ideal score for all items times 100% (Sugiyono, 2009).

Mathematically, it can be described by this equation:

Scoring percentage:

$$\frac{\sum \text{skoryangdiperolehdaripeneliti}}{\sum \text{skoridealseluruhitem}} \times 100\% \quad (1)$$

After obtaining the percentage using the formula above, media viability of kumite match statistical analysis in karate were categorized into five categories as follows:

Table 1: Coach review and media quality scoring category.

No	Percentage Range	Category
1.	0% - 20%	Very Poor
2.	20.1% - 40%	Poor
3.	40.1% - 60%	Fair
4.	60.1% - 80%	Good
5.	80.1% - 100%	Very Good

### 2.6 Product Specification

#### 2.6.1 Application Specification

The specification of kumite match statistical analysis in karate application is mentioned below:

(a) The table of kumite match statistical analysis consists of frequently used techniques in kumite. The table also consists of various categories for

analysis such as scored point, missed point, total attack and attack percentage.

(b) This analysis system comes with the statistic result which was compared to the other opponents.

(c) Besides, it comes with data recommendation for the coach to give a note during the match and also from the attack scored by the athletes.

(d) This analysis system also comes with printable document/result.

(e) This system uses programming language as follows: (1) HTML (HyperText Markup Language) stands as markup language used to create the website. (2) CSS (Cascading Style Sheet) decorates and manages the template or layout of the website to look more elegant and attractive. (3) Javascript as a programming language acting as a client side programming used to make the website more interactive. (4) PHP (Hypertext Preprocessor Program) as a programming language acting as a server side programming used to create dynamic web with data management. (5) Database development using MySQL software.

## 2.6.2 Manual Book Specification

The specification of kumite match statistical analysis in karate manual is mentioned as follows:

(a) The size of kumite match statistical analysis in karate manual is 148 x 210 mm.

(b) The background color is white with colorful line to separate between parts and chapters.

(c) It is comprised of 52 pages with 3 pages for opening, 2 pages for introduction, 1 pages for table of content, 3 pages for terms, 38 pages for chapter introduction to closing, 2 pages for bibliography, 1 for book and application designer profile.

(d) The cover uses ivory paper 210 gr.

(e) At the front cover, title, author name, picture and UNY logo are printed. As for the back, book description, author's profile, supervisor's profile, material validation expert and media validation expert profiles are written.

(f) The material used for content of the book is HVS 80 gr.

## 3 RESULT AND DEVELOPMENT

The result of small group trial comprised of five coaches of Dojo Lemkari Kartasura regarding kumite match statistical analysis media in karate showed that the score for interface with 94% was considered as "very good/feasible", for content aspect with 92.8% was considered as "very

good/feasible", and for programming aspect with 91.2% was considered as "very good/feasible". The total score of kumite match statistic analysis media quality testing according to Dojo Lemkari Kartasura coaches was 92.88%, categorized as "Very Good" and it can be concluded that the media worked very well and was feasible for testing in the large group.

Table 2: Small group kumite statistic analysis system product quality.

No	Aspect	Score Obtained	Max Score	%	Category
1.	Interface	188	200	94 %	Very Good
2.	Content	116	125	92.8 %	Very Good
3.	Programming	114	125	91.2 %	Very Good
Total Score		418	450	92.88 %	Very Good

Table 3: Large group kumite statistic analysis system product quality.

No	Aspect	Score Obtained	Max Score	%	Category
1.	Interface	375	400	93,75%	Very Good
2.	Content	239	250	95.6%	Very Good
3.	Programming	236	250	94.4%	Very Good
Total Score		850	900	94.44%	Very Good

The result of large group trial comprised of ten coaches of Lemkari Sukoharjo regarding kumite match statistical analysis media in karate showed that the score for interface with 93.75% was considered as "very good/feasible", for content aspect with 95.6% was considered as "very good/feasible", and for programming aspect with 94.4% was considered as "very good/feasible". The total score of kumite match statistical analysis media quality testing according to Dojo Lemkari Kartasura coaches was 94.44%, categorized as "Very Good" and it can be concluded that the media worked very well and was feasible to use in Sukoharjo regency.

## 4 DISCUSSION

Kumite match statistic analysis table in karate was developed into an application/ statistical analysis system for kumite matches in karate. It comes with the support of php (Hypertext Preprocessor Program) for karate trainers. According to the researcher's experience and observation, the typical techniques are featured in the material of kumite attack analysis application.

This research adopted a method developed by Sugiyono since his steps are suitable for product

development. This research aimed to create a product of kumite match statistical analysis system media in karate for the coaches in the form of web application. The product was supposed to be used for the coaches to analyze kumite class athletes' attack progress in the future.

After the initial product was produced, the product was then evaluated by the experts through validation by testing it on the trainer. The evaluation stage was carried out by material experts and media experts while the research stage was carried out in small group trials, and large group trials. The material expert validation process produced data used for initial product revisions. In the process of expert validation of this material, the researcher went through two stages, namely stage I and stage II. After the repairs were made in phase I, the product was validated again in stage II until finally the product was declared ready for test in material terms. After the validation by the material expert, the initial product was then validated to the media expert. From the media experts, data, suggestions and input are obtained to improve the quality of the product being developed. In the process of media validation, the researcher went through another two stages of validation, namely stage I and stage II. Validation data for stage I was used as a basis for revision to stage II, until finally in stage II the product was declared ready to be tested. The trial was carried out in two stages, the small group trial stage, and the large group trial stage. After going through product trials (small groups and large groups), the advantages and disadvantages of the media application are described below:

(1) *Advantages of Media Analysis for Kumite Match Statistics in Karate are:* (a) Attractive design and interface. (b) Operable via cellphone. Since it is dubbed as a web-based product, the application can be opened via its webpage without the need to install. (c) Helping coaches and athletes analyze the attack they used. (d) Captivating for coaches and athletes. (e) The data are automatically saved and printable.

(2) *Downsides of the Product are:* (a) Video system to detect the exact attack was still unavailable. Athletes need to manually operate the application by pressing the button of the available attack techniques. (b) Did not possess an official account. One data might be opened by all coaches so that anyone can access the information unless saved or removed. (c) It is currently used for Sukoharjo regency only.

## 5 CONCLUSIONS

This research developed karate championship statistical analysis system in the form of web-based application. Kumite match statistical analysis system in karate was developed using research and development approach (R & D). Kumite match statistical analysis system application as a whole was claimed feasible for championship or karate practices in kumite class after going through two testing stages. Experts' validation viability level of the average 97.14% was categorized as "very good" while media expert validation with 86.425% was also categorized as "very good." Small group trial of five coaches with average percentage of 92.88% was categorized as "very good" and large group trial of ten coaches with average percentage of 94.44% was categorized as "very good" as well.

In conclusion, Kumite match statistical analysis system in karate is feasible to use after clearing the two testing stages. This research development may be applied by the coaches during matches or karate practices.

## REFERENCES

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