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Development of Talent Scouting for Judo Sports Aged 10–13 Years

Rozwój systemu identyfikacji talentów w judo w wieku 10–13 lat

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Abstract

This study aims to develop a valid and reliable guidebook for identifying judo talent, which can be used to assess the potential of young judo athletes. The research employs a research and development methodology. On a small scale, the study involved participants from the Wira Mataram Judo Club, while large-scale testing was conducted with Talented Athletes Development (PAB) BPO DIY and PJSI Bantul Regency. All participants in the product trials were judo athletes aged 10–13 years. The data analysis technique used a giftedness formula by calculating the mean (M) and standard deviation (SD) of test results, which were then classified into five categories based on a normal distribution: very talented, talented, moderately talented, less talented, and not talented. The data from each test type were processed and converted into a giftedness formula. The study identified 17 judo talent identification test items, including:

- Anthropometric tests: 4 items – height, body fat, body weight, sitting height
- Biomotor tests: 8 items – strength (wall sit, push-up, back-up, sit-up), agility (side step test), flexibility (sit and reach), balance (dynamic balance test), endurance (Harvard step test)
- Skill-specific tests: 5 items – ushiro ukemi (sitting position), yoko ukemi (lying position), yoko ukemi (squatting and standing position), mae ukemi (kneeling position), judogi/mae mawari ukemi

The overall effectiveness test results showed a validity score of 0.86 and a reliability score of 0.9.

Key words

judo, talent identification, ages 10–13 years

Streszczenie

Celem niniejszego badania było opracowanie wiarygodnego i rzetelnego przewodnika do identyfikacji talentów w judo, który może służyć do oceny potencjału młodych zawodników. Badanie przeprowadzono z wykorzystaniem metodologii badań i rozwoju. W badaniu na małą skalę uczestniczyli zawodnicy z klubu judo Wira Mataram, natomiast testy na większą skalę przeprowadzono w ramach Programu Rozwoju Zawodników Utalentowanych (PAB) BPO DIY oraz PJSI w regionie Bantul. Wszystkie osoby biorące udział w testach to zawodnicy judo w wieku 10–13 lat. Do analizy danych zastosowano wzór na uzdolnienia, obliczając średnią (M) i odchylenie standardowe (SD) wyników testów, które następnie sklasyfikowano w pięciu kategoriach zgodnie z rozkładem normalnym: bardzo uzdolnieni, uzdolnieni, umiarkowanie uzdolnieni, mało uzdolnieni oraz nieuzdolnieni. Dane z każdego rodzaju testu zostały przetworzone i przekształcone we wzór na uzdolnienia. W wyniku badania zidentyfikowano 17 testów służących do oceny talentu w judo, w tym:

- Testy antropometryczne: 4 elementy – wzrost, poziom tkanki tłuszczowej, masa ciała, wysokość siedzenia
 - Testy biomotoryczne: 8 elementów – siła (przysiad przy ścianie, pompki, unoszenie tułowia w leżeniu, brzuszki), zwinność (test kroków bocznych), gibkość (test skłonu w siadzie), równowaga (test równowagi dynamicznej), wytrzymałość (test schodów Harvarda)
 - Testy umiejętności specyficznych: 5 elementów – ushiro ukemi (pozycja siedząca), yoko ukemi (pozycja leżąca), yoko ukemi (pozycja kuczna i stojąca), mae ukemi (pozycja kłęcząca), judogi/mae mawari ukemi
- Łączne wyniki testu skuteczności wykazały wartość trafności równą 0,86 oraz wartość rzetelności równą 0,9.

Słowa kluczowe

judo, identyfikacja talentów, wiek 10–13 lat

Introduction

From talent searches and monitoring to breeding, education, and training grounded in science and technology, efforts to raise sports accomplishments must focus on developing players as early as possible to enhance the quality of sports organisations both centrally and locally [1]. Coaching is structured and programmed, beginning with the parent organization of the sports branch at both the central and regional levels [2]. Coaching also involves empowering sports organizations, developing national and regional sports coaching centers, and organizing competitions in a tiered and sustainable manner [3]. The sports development system cannot be implemented immediately; it must follow established procedures and designs. Sports development cannot be achieved through minimal planning—it requires totality and commitment to develop sports logically, analytically, and systematically [4]. To achieve peak performance, a continuous and gradual training regimen is required [5]. Therefore, talent searches under talent guidance must be taken into account in Indonesia's sports achievement development system, especially in the sport of judo, so enabling the method of identifying potential sports talents, which starts early age, to help children in determining their athletic potential.

In preparation for the 2000 Sydney Olympics, Australia held a movement known as The National Talent Identification and Development Program for the Sydney Olympic Games. This movement has two main programs: Sport Search and Talent Search. The Australian Sports Commission developed this talent scouting program in response to the country's previous decline in gold medal wins at several Olympics. Efforts to foster these achievements through an IPTEK approach include identifying talented athletes [6].

Talent must be identified at an early age so that it can be properly nurtured to produce quality players and athletes [7]. Identifying and directing talented individuals to relevant sports is critical for athletic success [8]. Success in a sport can only be attained by those who are talented, meet the sport's requirements from a young age, and consistently follow systematic training over time (9). Detecting and identifying athletes is critical for the athlete development process, including the initial selection of scouts and subsequent stages of the program [10].

Achievements in the sport of judo in Indonesia are currently experiencing fluctuations. The achievements obtained differ greatly from those of the 1980s, when Indonesia consistently ranked first. Aside from the achievements of Indonesian sports, what needs to be observed at this time is how to develop sports in Indonesia so that the achievements of the 1980s are realized again [11]. To optimize judo performance, well-established planning is needed and must be closely aligned with the implemented coaching pattern. Almost every country has a pyramid concept in its development system. The pyramid concept of achievement development includes three stages, namely: (1) multilateral stage, (2) specialization stage, and (3) peak achievement stage. The multilateral stage is to develop basic movement patterns, the specialization stage is adaptation to the specifics of the sport, and the peak stage of achievement is physical, technical, tactical and mental maturation [12]. For this reason, a massing, breeding and development process is needed which is carried out continuously, gradually and sustainably.

Besides the development of sports is also influenced by the coaching system. If the coaching system implemented runs well, sports development will also be better. The sports development system is based on (1) physical education and national organizations, which include educational programs in schools, recreation and sports clubs and organizational structures in government and (2) the sports training system [13].

Talented Judo athletes' coaching program may be carried out with planned, consistent, quantifiable training combining several disciplines and technology. In highly competitive settings, sports coaches have to surely put in great effort to produce outstanding athletes (14). Talented sportsmen have to be carefully selected if they are to perform at best.

In general, sports coaching and development from an early age, namely the period from approximately 6 years to 14 years of age (6 to 14 years), is part of national policy. Training periodization can be divided into multilateral (ages 6-14 years) and specialization (ages 15 years and above). The multilateral training period can be further classified into two groups, namely the initial period ranging from 6-10 years of age and the formation period ranging from 11-14 years of age. The explanation in the following image:

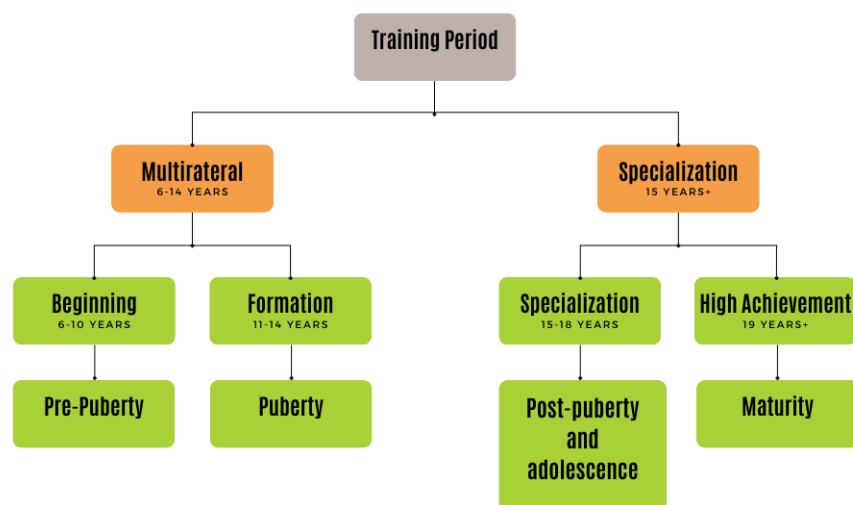


Figure 1. Exercise Periodization (source: APORI, 2014: 2)

Currently, there are very few guidelines for measuring instruments to identify judo talent aged 10–13, prompting the author to develop a guidebook instrument. Judo identification guidelines for children aged 10 to 13 are used to assess the potential of a judo athlete through valid and reliable measures. Measurements have to be done in order to identify and evaluate judo ability. These tests have to be fit for the demands and traits of judo athletes between the ages of 10 and 13. This paper will concentrate on creating a tool for spotting judo athletic talent between the ages of 10 and 13

that, from what the author knows, has never been investigated previously.

Materials and Methods

Design

This study employs research and development methods commonly used in the production of specific products and tests their effectiveness. The research aims to develop specific products, focusing on needs analysis and testing their effectiveness to ensure they are applicable in the wider community.

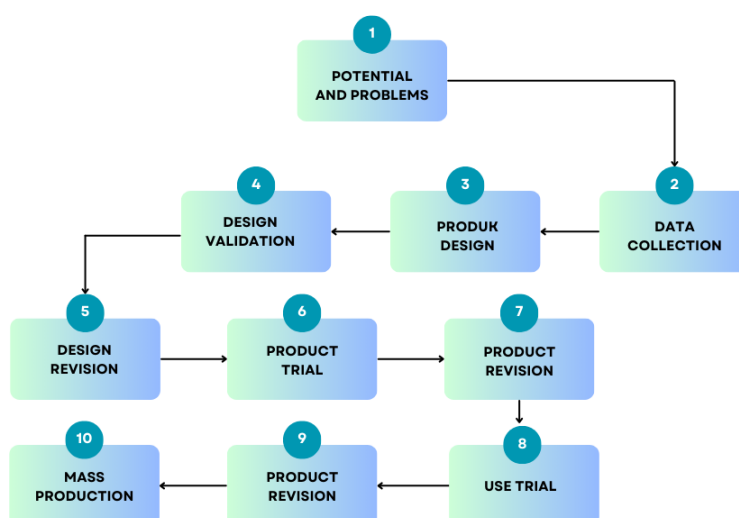


Figure 2. The steps for using the Research & Development Method are as follows

Sample

The sample size for this study was 45 athletes. The sample yielded two sets of data. Validity and reliability testing was carried out on samples other than those used during the instrument development stage. Wira Mataram Judo Club collected small-scale data from up to 15 athletes aged 10 to 13 years. The Talented Athlete Development (PAB) program of BPO DIY and the All Indonesia Judo Association (PJSI) of the Bantul DIY district collected large-scale data from 30 athletes aged 10–13 years. Thus, testing is done independently to ensure that the instrument is valid and consistent when applied to a larger population. The study's sample included boys and girls aged 10 to 13 years old, so the findings can be applied to both genders' physical condition and potential judo talent. Boys and girls were included due to differences in physical and motor development between the ages of 10 and 13 years, ensuring that the test results are representative and fair to both genders.

Purposive sampling was used in this study to select participants based on specific criteria related to the research objectives. The sample selection criteria include: (1) athletes aged 10

to 13, (2) active registration in a participating judo club, and (3) current participation in an early age athlete development program. This technique was chosen to ensure that the selected subjects matched the characteristics needed for developing the judo talent instrument.

Variables

The variables in this study are anthropometric test variables, biomotor abilities, and judo technique ability tests. The data analysis in this study focused on developing a formula to identify judo sports talent in individuals aged 10 to 13. This study's data analysis used descriptive statistics to group test results into talent level categories, such as very talented, talented, quite talented, less talented, and not talented. Additionally, validity and reliability tests were conducted to ensure that the test instruments used were accurate and consistent. After processing the data and determining the mean (M) and standard deviation (SD), the data is interpreted by categorizing it into five categories: very talented, talented, quite talented, less talented, and not talented, using the following formula:

Table 1. Special Interest and Talent Category for Judo Sports [15]

No	Category	Formula
1	very talented	On $M + (1.5 \times SD) > UP$
2	talented	On $M + (0.5 \times SD) S/DM + (1.5 \times SD)$
3	quite talented	On $M - (0.5 \times SD) S/DM + (0.5 \times SD)$
4	less talented	On $M - (0.5 \times SD) S/DM - (0.5 \times SD)$
5	not talented	Down $< M - (1.5 \times SD)$

M = Mean. SD = Standard Deviation, S/D = Up to...

Table 2. Judo Sports Talent Identification Formula

No	Category	Formula
1	very talented	On $M - (1.5 \times SD) < \text{DOWN}$
2	talented	On $M - (0.5 \times SD) \leq \text{DM} - (1.5 \times SD)$
3	quite talented	On $M + (0.5 \times SD) \leq \text{DM} - (0.5 \times SD)$
4	less talented	On $M + (0.5 \times SD) \leq \text{DM} + (0.5 \times SD)$
5	not talented	Down $> M + (1.5 \times SD)$

M = Mean. *SD* = Standard Deviation, *S/D* = Up to...

Because some tests in this study consider lower scores to be better, the formula above has been adjusted accordingly.

Then the next step is to analyze the data by calculating the total score scale obtained per test item to draw conclusions regarding the norms for the gifted category in identifying talent for judo aged 10-13 years from the research conducted.

Instruments

Field observations indicate that the following tools are required

for identifying judo talent in children aged 10 to 13: (1) Anthropometric Test, (2) Biomotor Components, and (3) Judo Technical/ Division Skills Test. This work aims to provide accurate evaluation instruments and talent identification rules for judo sports. The developed instrument for 10–13-year-olds is valid and reliable, with normative values consistent with the judo talent identification test. The developed instrument is expected to be used as a tool to assess judo sports talent for children aged 10 to 13, thereby aiding in the development of judo sports and the search for judo sports talent.

Table 3. New Paradigm of Talent Identification for Judo Ages 10-13 Years

Judo Talent Identification at the moment	Judo Talent Identification New Paradigm
There has been no research on identifying talent for judo aged 10-13 years	• There has been research on identifying talent for judo aged 10-13 years
• There is no appropriate test instrument to measure judo talent aged 10-13 years	• An appropriate test instrument has been found to measure judo talent aged 10-13 years with test norms
• There is no guidebook regarding the procedures for carrying out the judo talent identification test for ages 10-13 years	• There is already a guidebook regarding the procedures for carrying out the judo talent identification test for ages 10-13 years
• At the start of the training program, athletes aged 10-13 years have not yet had a talent identification test	• At the start of the training program, athletes aged 10-13 years are expected to be able to take a talent identification test

Based on the theoretical basis and framework of thought above, and considering the importance of talent identification, an assessment instrument for judo sport talent identification aged 10-13 years is very necessary. Having this assessment instrument will make it easier for trainers to monitor success in implementing training programs for peak performance.

Results

Field observations show that talent searches for judo athletes

at the regional level still rely on systems that are not scientifically justified. Therefore, determining the product design of test items that are in accordance with the characteristics of this judo sport goes through several stage.

The stages are as follows:

1. Selecting judo talent identification test items that approach the needs and characteristics of judo sports include:

a. Anthropometric tests include:

Table 4. Anthropometric tests

No	Types of anthropometric tests
1.	Height
2.	Shoulder width
3.	Chest width
4.	Hip width
5.	Fat (tricep, subscapular)
6.	Sitting height
7.	Body weight
8.	Hand span

b. Biomotor include:

Table 5. Biomotor

No.	Biomotor Component	Test Type
1.	Cardiovascular Test	Namely a 4.8 km fast walking test and multistage (multistage fitness test)
2.	General movement ability test	1) standing board jump 2) softball throws 3) zig-zag run 4) tennis ball throwing 5) basketball throwing 6) medicine ball put 7) 50 meter sprint

No.	Biomotor Component	Test Type
3.	Motor educability test	1) One Foot_Touch Head 2) Side Learning Rest 3) Grapevine 4) One-Knee Balance 5) Stork Stand 6) Double Heel Click 7) Cross-Leg Squat 8) Full Left Turn 9) One Knee-Head to Floor 10) Hop Backward 11) Forward Hand Kick 12) Full Squat-Arm Circle 13) Half-Turn Jump-Left Foot 14) Three Dips 15) Side Kick 16) Kneel, Jump to Feet 17) Russian Dance 18) Full Right Turn, The Top 19) Single Squat Balance 20) Jump Foot.
4.	Strength measurement test	1) push up 2) sit up 3) pull up 4) back up 5) wall sit
5.	Muscle strength measurement test	1) handgrip dynamometer 2) pull and push dynamometer 3) back dynamometer 4) leg dynamometer 5) one-repetition maximum (1-rm) (with bench press, leg press, and arm curl),
6.	Agility measurement	1) side step test 2) shuttle run test
7.	Flexibility measurement	1) sit 2) reach test
8.	Speed measurement	using 6 second sprint test, 50 yard (45.73m) sprint test
9.	Reaction speed measurement	1) the nelson hand reaction test 2) the nelson foot reaction test
10.	Explosive power measurement	margaria kalamen test
11.	Balance measurement	1) dynamic balance test 2) the stork stands test
12.	Physical fitness/heart lung endurance test	1) running 2.4 km 2) havard step test 3) running 12 menit

c. Test judo/division technique ability, include:

Table 6. Test judo/division technique ability

No.	Biomotor Component	Test Type
1.	Basic techniquesfalling techniques (ukemi waza)	1) yoko ukemi side fall in sitting position 2) yoko ukemi side fall in squatting and standing position 3) ushiro ukemi back fall in sitting position 4) ushiro ukemi back fall in standing squat position 5) mae ukemi front fall on kneeling 6) mae ukemi fall front squat standing 7) mae mawari ukemi/jugeri kneeling and standing
2.	Basic grip in judo (kumikata)	Pulling and pushing

Some of the tests listed above are relevant to talent identification in the sport of judo, and field observations yielded the following percentage results:

Table 7. Talet Identification

No.	Test Type	Percentage (%)
1	Height	100
2	Shoulder width	35.71
3	Chest width	32.71
4	Hip width	32.14
5	Fat (tricep, subscapular)	85.71
6	Sitting height	89.28
7	Body weight	100
8	Hand span	28.57
9	Fast walking test 4.8 km	28.57
10	Multistage (multistage fitness test)	46.42
11	Standing board jump	46.42
12	Softball throws	25
13	Zig-zag run	39.28
14	Tennis ball throw	28.57
15	Basketball throws	32.14
16	Medicine ball put	25
17	50 meter sprint	48.85
18	One foot touch head	42.85
19	Side learning rest	46.42
20	Grapevine	46.42
21	One-knee balance	39.28
22	Stork stand	46.42
23	Double heel clicks	35.71
24	Cross-leg squat	42.85
25	Full left turn	39.28
26	One knee-head to floor	42.85
27	Hop backward	39.28
28	Forward hand kick	28.57
29	Full squat-arm circle	35.71
30	Half-turn jump-left foot	39.28
31	Three dips	28.57
32	Side kick	25
33	Kneel	25
34	Jump to Feet	25
35	Russian dance	25
36	Full right turn	28.57
37	The top	32.14
38	Single squat balance	35.71
39	Jump foot	28.57
40	Push up	96.42
41	Sit up	96.42
42	Pull up	42.85
43	Back up	78.57
44	Wall sit	92.85
45	Handgrip dynamometer	42.85
46	Pull and push dynamometer	39.28
47	Back dynamometer	35.71
48	Leg dynamometer	46.42
49	One-repetition maximum (1-RM) bench press	35.71
50	Leg press	39.28
51	Arm curl	35.71
52	Side step test	89.28
53	Shuttle run test (lari bolak-balik)	46.42
54	Sit and reach test	85.71
55	6 second sprint test	28.57
56	50 yard sprint test (45.73m)	25
57	The Nelson hand reaction test	25
58	The Nelson foot reaction test	25
59	Margaria kalamen test	25
60	Dynamic balance test	75
61	The Stork stands test	28.57
62	2.4 km run	42.85
63	Up and down the bench (Harvard step test)	92.85
64	12 minutes run	32.14
65	Yoko ukemi side falls in sitting position	100
66	Yoko ukemi side falls in squatting and standing position	96.42
67	Ushiro ukemi back falls in sitting position	100
68	Ushiro ukemi back falls in squatting standing position	46.42
69	Mae ukemi front falls in kneeling position	92.85
70	Mae ukemi front falls in squatting standing	42.85
71	Mae mawari ukemi/jugeri kneeling and standing	71.42
72	Kumikata pulling and pushing	46.42

2. Product design comes next; this entails choosing numerous questions with a percentage higher than 50% and organising them

from top to bottom to evaluate judo sports skill aged 10 to 13 years. A total of 17 test elements have been adapted for judo:

Table 8. Test Items

No.	Test Items above 50%
1.	Height
2.	Fat
3.	Body weight
4.	Sitting height
5.	Wall sit
6.	Push up
7.	Back up
8.	Sit up
9.	Side step test
10.	Sit and reach
11.	Dynamic balance test
12.	Havard step test
13.	Ushiro ukemi sitting position
14.	Yoko ukemi posisi lying positions
15.	Yoko ukemi squatting and standing positions
16.	Mae ukemi kneeling position
17.	Jugeri/mae mawari ukemi

These 17 exams were selected to reflect three main elements that are crucial for success in judo: The possibility for an optimal physique in judo is evaluated using anthropometric traits like height, weight, body fat, sitting height. Basic physical condition aspects (strength, endurance, flexibility, agility, and balance): to improve technical ability and movement efficiency during competition. Basic judo technical skills (ukemi and jugeri) are essential for technique safety and effectiveness. The test selection also considers the characteristics of children aged 10 to 13, who are in the motor growth phase and require a comprehensive approach that includes both physical and technical aspects.

3. Then prepare a draft guide for implementing test procedures, with the recommended sequence for implementing the first stage of tests being the anthropometric test. This test has

a very important role in the sport of Judo, namely covering height, fat, weight, sitting height, the second stage test is the physical ability test (biomotor) including wall sits, push ups, back ups, sit ups, side step test, sit and reach your toes (sit and reach) with a meter box, dynamic balance test, and bench up and down test (Havard step test). It should be noted that the up and down bench test (Havard step test) is carried out last in the second stage of the test. Furthermore, the test of technical ability/skills in judo includes a branch test, namely falling techniques (ukemi waza) including back falls (Ushiro Ukemi) in a sitting position, side falls (Yoko Ukemi) in a lying position, squatting and standing, front falls (Mae Ukemi) in a kneeling position and Jugeri/rolling forward (mae mawari ukemi) from a kneeling and standing position. The special talent identification test for judo is explained in the following picture:

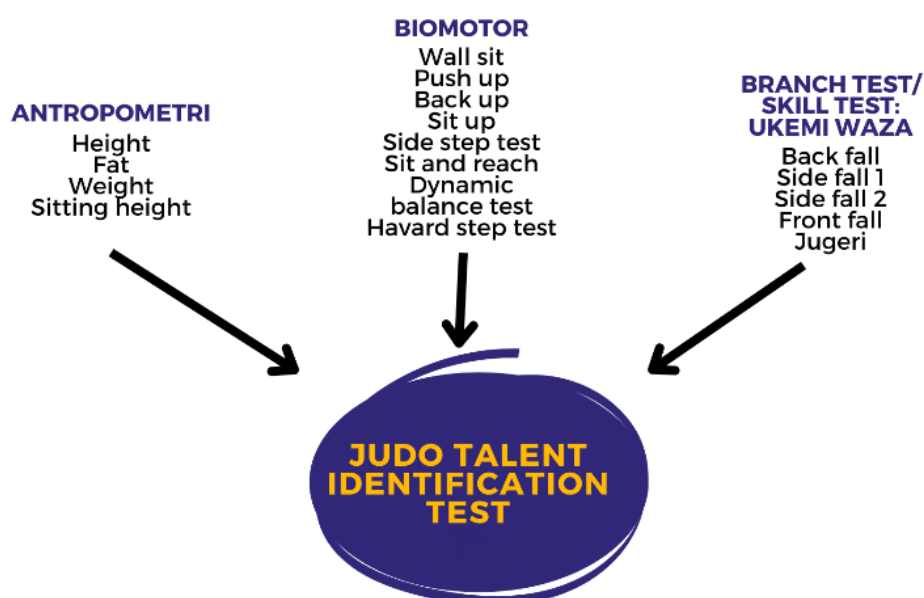


Figure 3. Judo Talent Identification Test Items

4. The next stage is to develop an assessment and evaluation flow, in the identification flow of scouting special sports

interests and talents from start to finish, the category of talent level is found, briefly explained in the following picture:

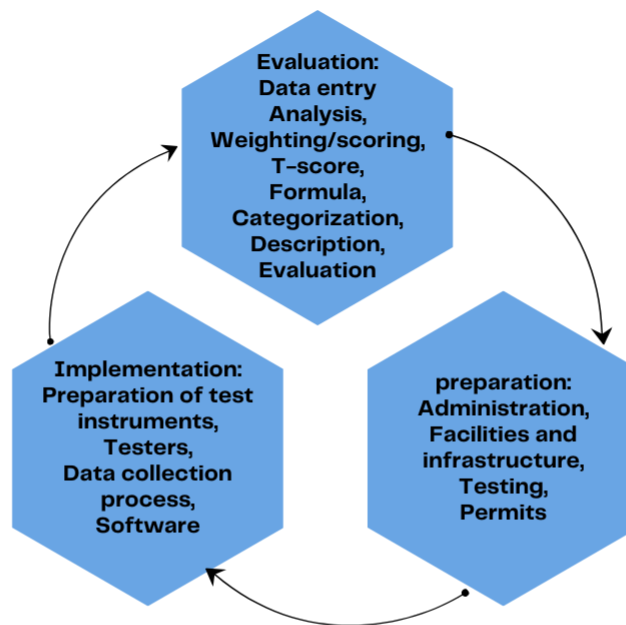


Figure 4. Flow of Implementation and Data Analysis (Reference: (15))

The small-scale trial was conducted to evaluate the practical applicability of the talent identification guide. The subjects of this small-scale trial were athletes aged 10-13 years from the Wira Mataram Judo Club. Based on the results of the small-scale trial assessment of the product being developed, it shows that the total score of 93 (39%) samples stated that it was suitable, while the score of 147

(61%) of the other samples stated that it was very suitable, it can be concluded that the results of the development of the judo sports talent identification instrument aged 10 -13 years can be said to be easy for testers to understand and implement with several suggestions and comments. The percentage results from the assessment above can be seen in the following diagram:

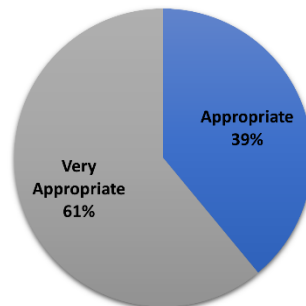


Figure 5. Small Scale Trial Results Percentage Diagram

The next stage is based on the results of small-scale trials, then product revisions are carried out before large-scale trials are carried out. The improvements made include aspects suggested by users when using the product. Based on comments and sug-

gestions from users regarding the judo sports talent identification instrument aged 10-13 years, a revision was carried out again to improve the product in the form of a guidebook. The revisions to the product are explained in the following table:

Table 9. Small Scale Product Revision

No	Before Revision	After Revision
1	The size of the writing in the guidebook is too small and difficult to read	The size of the writing in the guidebook has been enlarged and is easy to read
2	There is no picture of the test implementation flow yet	There is already a picture of the test implementation flow
3	There is no picture of the test sequence yet	There is already a picture of the test sequence
4	The book cover does not include photos of children aged 10-13 years who received gold medals	The book cover includes a photo of a child aged 10–13 who received a gold medal.

Then, based on several suggestions and input from users of the talent identification manual for judo sports aged 10-13

years, the product design was revised again to proceed to the next stage, namely the large-scale trial stage. Large-scale

trials were carried out at the Talented Athletes Development (PAB) BPO DIY program and the All-Indonesian Judo Association (PJSI) Bantul Regency, Yogyakarta.

This large-scale trial is a follow-up to the product revision of the small-scale trial. From the results of the large-scale trials, suggestions and comments were then obtained to revise the product before carrying out an effectiveness test. Based on the results of the large-scale trial assessment of the product being

developed, it shows that the total score of 130 (27%) samples stated that it was suitable, while the score of 350 (73%) of the other samples stated that it was very suitable, it can be concluded that the results of the development of the judo sports talent identification instrument aged 10–13 years can be said to be easy for testers to understand and implement with several suggestions and comments. The percentage results from the assessment above can be seen in the following diagram:

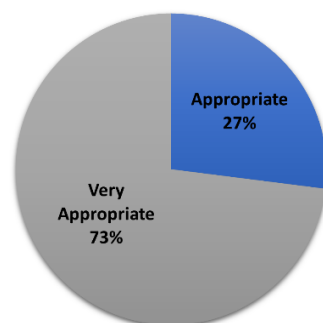


Figure 6. Large Scale Trial Results Percentage Diagram

The improvements made include aspects suggested by users when using the product. Based on comments and suggestions from users regarding the judo sports talent identification

instrument for ages 10–13, the product was revised accordingly. The revisions to the product are explained in the following table:

Table 10. Large Scale Product Revision

No	Before Revision	After Revision
1	There is no way to assess the judo sports talent identification instrument for ages 10-13 years	There is already a method for assessing judo sports talent identification instrument ages 10-13 years
2	The photos in the manual are not in color	The photos in the guidebook are in color
3	The manual is not yet concise/too thick	The manual is concise/not too thick

The next stage, after product revision from large-scale results, continued with product effectiveness testing in the form of a talent identification guidebook for judo sports aged 10-13 years. This was carried out by testing the validity of the test

instrument using a test-retest test, namely data from two observations using the same instrument.

The results of testing the validity of this talent identification test instrument include:

Table 11. Results of Instrument Validity Testing

No	Items Test	Calculated r
1.	Height	1
2.	Fat	1
3.	Body weight	1
4.	Sitting height	1
5.	Wall sit	0,955
6.	Push up	0,965
7.	Back up	0,904
8.	Sit up	0,921
9.	Side step test	0,766
10.	Sit and reach	0,960
11.	Dynamic balance test	0,860
12.	Havard step test	0,816
13.	Ushiro ukemi sitting position	0,809
14.	Yoko ukemi posisi lying positions	0,630
15.	Yoko ukemi squatting and standing positions	0,731
16.	Mae ukemi kneeling position	0,829
17.	Jugeri/mae mawari ukemi	0,843

The results of the research hypothesis testing are compared to the r -value. The r -table value for $N = 50$ with a 5% significance level is 0.279. Based on the results, it is clear that the validity test of the talent identification test instrument yields r count $> r$ table. Based on these findings, it can be

concluded that all types of judo sport talent identification test questions for ages 10-13 are valid.

Based on the results of reliability testing of the judo sports talent identification test instrument aged 10 - 13 years, is known:

Table 12. Reliability test

No	Items Test	Calculated r
1.	Height	1
2.	Fat	1
3.	Body weight	1
4.	Sitting height	1
5.	Wall sit	0,997
6.	Push up	0,978
7.	Back up	0,942
8.	Sit up	0,958
9.	Side step test	0,867
10.	Sit and reach	0,977
11.	Dynamic balance test	0,925
12.	Havard step test	0,897
13.	Ushiro ukemi sitting position	0,891
14.	Yoko ukemi posisi lying positions	0,769
15.	Yoko ukemi squatting and standing positions	0,844
16.	Mae ukemi kneeling position	0,906
17.	Jugeri/mae mawari ukemi	0,914

The reliability coefficients for all judo talent identification test instruments for ages 10–13 exceeded 0.5, indicating moderate to high consistency depending on the item. These findings suggest that the judo talent identification test instrument for ages 10-13 is reliable and worthy of continued mass production.

After conducting small-scale and large-scale tests and receiving results indicating that all judo talent identification test instruments for ages 10-13 are suitable for use, the next stage is the effectiveness test. This stage involves an analysis of data from the judo talent identification test results for ages 10 to 13, which have been declared valid and reliable.

The results of the effectiveness test data obtained mean (M) and standard deviation (SD) values for each test item so that they can be used to calculate norms and standards for assessing the judo sports talent identification test aged 10-13 years, as follows:

1. Height

The results of height data analysis obtained an average data value (Mean) of 146.32 and a standard deviation (SD) of 6.96. After the calculation is complete, the next step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results of calculating height norms and standards were obtained as follows:

Table 13. Standard Body Height Value (centimeters)

Mark	Category	Results
1	very talented	156.7 cm > Above
2	talented	149.7 cm to 156.7 cm
3	quite talented	142.8 cm to 149.7 cm
4	less talented	135.8 cm to 142.8 cm
5	not talented	< 135.8 cm

$S/D = Up\ to...$

2. Fat (trisept, subskapula)

The results of fat data analysis obtained an average data value (Mean) of 10 and a standard deviation (SD) of 2.51. After the calculation is complete, the next step is to determine the norm

classification by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports aged 10 – 13 years. The results of calculating fat norms and standards were obtained as follows:

Table 14. Standard Fat Value (millimeters)

Mark	Category	Results
5	very talented	6.2 mm > Above
4	talented	8.7 mm to 6.2 mm
3	quite talented	11.2 mm to 8.7 mm
2	less talented	13.7 mm to 11.2 mm
1	not talented	< 13.7 mm

$S/D = Up\ to...$

3. Weight

The results of the analysis of body weight data obtained an average data value (Mean) of 37.73 and a standard deviation (SD) of 8.37. After the calculation is complete, the next step is to

determine the norm classification by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports aged 10 – 13 years. The results of calculating body weight norms and standards were obtained as follows:

Table 15. Standard Body Weight Value (kilograms)

Mark	Category	Results
5	very talented	50.28 kg > Above
4	talented	41.91 kg to 50.28 kg
3	quite talented	33.54 kg to 41.91 kg
2	less talented	25.17 kg to 33.54 kg
1	not talented	< 25.17 kg

S/D = Up to...

4. Sitting height

The results of the analysis of sitting height data obtained an average data value (Mean) of 75.06 and a standard deviation (SD) of 3.60. After the calculation is complete, the next step

is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards for sitting height are as follows:

Table 16. Standard Sitting Height Value (centimeters)

Mark	Category	Results
5	very talented	80.4 cm > Above
4	talented	76.8 cm to 80.4 cm
3	quite talented	73.2 cm to 76.8 cm
2	less talented	69.6 cm to 73.2 cm
1	not talented	< 69.6 cm

S/D = Up to...

5. Wall sit

The results of wall sit data analysis obtained an average data value (Mean) of 94.04 and a standard deviation (SD) of 23.52. After the calculation is complete, the next step is to

determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating wall sit norms and standards are as follows:

Table 17. Standard Wall Sit Value (seconds)

Mark	Category	Results
5	very talented	129.32 seconds > Up
4	talented	105.8 seconds to 129.32 seconds
3	quite talented	82.28 seconds to 105.8 seconds
2	less talented	58.78 seconds to 82.28 seconds
1	not talented	< 58.78 seconds

S/D = Up to...

6. Push Up

The results of the push up data analysis obtained an average data value (Mean) of 42.16 and a standard deviation (SD) of 10.30. After the calculation is complete, the next step is to

determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained for calculating push up norms and standards are as follows:

Table 18. Standard Push Up Value (times)

Mark	Category	Results
5	very talented	58 times > Up
4	talented	47 times to 58 times
3	quite talented	37 times to 47 times
2	less talented	27 times to 37 times
1	not talented	< 27 times

S/D = Up to...

7. Back Up

The results of the push up data analysis obtained an average data value (Mean) of 92.68 and a standard deviation (SD) of 13.96. After the calculation is complete, the next step is to

determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating back up norms and standards are as follows:

Table 19. Standard Back Up Value (times)

Mark	Category	Results
5	very talented	114 times > Up
4	talented	100 times to 114 times
3	quite talented	86 times to 100 times
2	less talented	72 times to 86 times
1	not talented	< 72 times

S/D = Up to...

8. Sit Up

The results of sit up data analysis obtained an average data value (Mean) of 42.24 and a standard deviation (SD) of 10.68. After the calculation is complete, the next step is to

determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards for sit ups are as follows:

Tabel 20. Standard Sit Up Value (times)

Mark	Category	Results
5	very talented	58 times > Up
4	talented	48 times to 58 times
3	quite talented	37 times to 48 times
2	less talented	26 times to 37 times
1	not talented	< 26 times

S/D = Up to...

9. Side Step Test

The results of the side step test data analysis obtained an average data value (Mean) of 8.75 and a rough standard deviation (s) of 0.76. After the calculation is complete, the next

step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards of the side step test are as follows:

Table 21. Side Step Test Value Standards (points)

Mark	Category	Results
5	very talented	9.8 points > Above
4	talented	9.1 points to 9.8 points
3	quite talented	8.3 points to 9.1 points
2	less talented	7.6 points to 8.3 points
1	not talented	< 7.6 points

S/D = Up to...

10. Sit and Reach

The results of the sit and reach data analysis obtained an average data value (Mean) of 40.64 and a rough standard deviation (s) of 4.75. After the calculation is complete, the

next step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results of calculating sit and reach norms and standards are as follows:

Table 22. Standard sit and reach value (cm)

Mark	Category	Results
5	very talented	47.76 cm > Above
4	talented	43.01 cm to 47.76 cm
3	quite talented	38.26 cm to 43.01 cm
2	less talented	33.51 cm to 38.26 cm
1	not talented	< 33.51 cm

S/D = Up to...

11. Dynamic Balance Test

The results of the dynamic balance test data analysis obtained an average data value (Mean) of 70.8 and a rough standard deviation (s) of 22.32. After the calculation is complete, the next

step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating norms and standards for the dynamic balance test are as follows:

Table 23. Standard Dynamic Balance Test Value (points)

Mark	Category	Results
5	very talented	100 points > Above
4	talented	85 points to 100 points
3	quite talented	60 points to 85 points
2	less talented	40 points to 60 points
1	not talented	< 40 points

S/D = Up to...

12. Harvard Step Test

The results of the Harvard step test data analysis obtained an average data value (Mean) of 106.36 and a rough standard deviation (s) of 21.26. After the calculation is complete, the next

step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards of the Harvard step test are as follows:

Table 24. Harvard Step Test Value Standards

Mark	Category	Results
5	very talented	119 > Up
4	talented	105 to 119
3	quite talented	90 to 105
2	less talented	75 to 90
1	not talented	< 75

S/D = Up to...

13. Back fall (ushiro ukemi) sitting position

The results of the branch test analysis using a rubik for assessing the performance of falling technique skills (ukemi waza) in the test participants were obtained proportionally and in accordance with the judo sport branch which was carried out by considering the competency of the test participants in performing the falling technique (ukemi waza). Determination of competency standards in assessing the performance of basic judo technical skills is carried out

through interpretation into assessment norms. The results of the data analysis of Ushiro Ukemi's sitting position obtained an average data value (Mean) of 10.48 and a standard deviation (SD) of 1.16.

After the calculation is complete, the next step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards for ushiro ukemi sitting position are as follows:

Table 25. Standard Value Ushiro Ukemi sitting position (score)

Mark	Category	Results
5	very talented	12 > Up
4	talented	11 to 12
3	quite talented	10 to 11
2	less talented	9 to 10
1	not talented	Down < 9

S/D = Up to...

14. Side fall (yoko ukemi) lying position

The results of data analysis of Yoko Ukemi's lying position obtained an average data value (Mean) of 10.66 and a standard deviation (SD) of 1.02. After the calculation is complete, the next step

is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The following are the findings of computing the norms and standards for Yoko Ukemi's laying posture:

Table 26. Standard value of yoko ukemi lying position (score)

Mark	Category	Results
5	very talented	12 > Up
4	talented	11 to 12
3	quite talented	10 to 11
2	less talented	9 to 10
1	not talented	Down < 9

S/D = Up to...

15. Side falls (yoko ukemi) squatting and standing positions
The results of Yoko Ukemi's data analysis in squatting and standing positions obtained an average data value (Mean) of 9.6 and a standard deviation (SD) of 1.35. After the calculation is complete, the next step is to determine the

classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards for Yoko Ukemi squatting and standing positions are as follows:

Table 27. Standard Value of Yoko Ukemi squatting and standing position (score)

Mark	Category	Results
5	very talented	12 > Up
4	talented	10 to 12
3	quite talented	9 to 10
2	less talented	8 to 9
1	not talented	Down < 8

S/D = Up to...

16. Front fall (mae ukemi) kneeling position
The results of data analysis for mae ukemi kneeling position obtained an average data value (Mean) of 9.82 and a standard deviation (SD) of 1.20. After the calculation is complete, the next

step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards for mae ukemi kneeling position are as follows:

Table 28. Standard Value mae ukemi kneeling position (score)

Mark	Category	Results
5	very talented	12 > Up
4	talented	10 to 12
3	quite talented	9 to 10
2	less talented	8 to 9
1	not talented	Down < 8

S/D = Up to...

17. Jugi / rolling forward (mae mawari ukemi) kneeling and standing positions

The results of the data analysis for Mae Mawari Ukemi in kneeling and standing positions obtained an average data value (Mean) of 9.4 and a standard deviation (SD) of 1.24. After the

calculation is complete, the next step is to determine the classification of norms by formulating the calculation of norms for the Special Interest and Talent category for Judo Sports. The results obtained from calculating the norms and standards for Mae Mawari Ukemi kneeling and standing positions are as follows:

Table 29. Standard Value jugeri/mae mawari ukemi kneeling and standing position (score)

Mark	Category	Results
5	very talented	11 > Up
4	talented	10 to 11
3	quite talented	9 to 10
2	less talented	8 to 9
1	not talented	Down < 8

S/D = Up to...

Discussion

Given the limited research on judo talent, one approach to improving talent development is to define sport-specific talent concepts [16–18]. The purpose of this essay is to design exam questions capable of spotting judo potential. Judo skills can be identified early in children aged 10 to 13 [7]. Moreover, it should be mentioned that skill in many sports including judo [20] has been understood using the opinions of trainers as sources of knowledge. By means of the aptitude test findings, coaches and physiotherapists may collaborate to design a training program that efficiently combines the prevention of injuries with the development of technical ability. While coaches focus on improving specific judo skills based on test

results, physiotherapists provide remedial therapies addressing physical shortcomings, including muscular imbalances, flexibility limitations, and postural control. This cooperation allows for a more thorough and customised style to instruction.

Based on the results of this study, judo talent may be determined using 17 objects acting as a guide. Development of anthropometric test criteria for judo talent depends critically on height [21–23]. In judo [24], taller height can offer benefits in terms of attack range and distance management. Therefore, the athlete selection and development process depends much on a complete awareness of how height affects judo performance. Measurements of

height expose an athlete's body type, which might affect the most suitable weight class and competitive approach [25]. Comparison of the results of this study with the Talent Identification and Development (TID) method and the Eurofit Test Battery states that height and jumping are required in elite women's volleyball, but motor coordination is a key factor in recognizing talent in girls aged 6–14 years [26].

Body fat percentage provides valuable information about an athlete's body composition, which has a direct impact on performance [27]. Judo athletes with optimal body composition, characterized by low and healthy levels of body fat, perform better due to improved speed, efficiency, and endurance during matches [28]. As a result, measuring and monitoring body fat is an important part of a judo athlete's training and development program, allowing coaches to adjust diet and training plans to achieve peak physical condition.

Weight measurement is critical because judo is a sport in which athletes are classified by weight class, so having an appropriate weight is essential for competing effectively in the correct category [29]. Effective weight management helps coaches to suggest the required diet [30].

Measurements of sitting height expose details about an athlete's upper body dimensions, which might affect balance and playing style [31]. Maintaining an acceptable centre of gravity depends on a sitting height commensurate with total body height, therefore enhancing the athlete's capacity to regulate their own and their opponent's movements.

The wall sit test is an effective tool for assessing judo athletes' strength and endurance potential, allowing coaches to design appropriate training programs to improve their performance [32]. The push-up test clearly indicates an athlete's upper body muscle strength and endurance capacity, allowing coaches to assess their overall physical condition [33]. Push-up test an athlete's upper body strength, which reflects their ability to grip, control an opponent, and execute throwing techniques with stability. Meanwhile, the back-up test measures back muscle strength, which is critical for maintaining postural stability, core strength, and performing explosive movements common in judo throw techniques. Both types of strength contribute significantly to technique efficiency and injury prevention in young judo athletes.

The back-up test evaluates back muscle strength, which is essential for body control and postural stability in judo techniques. Crucially for core stability and body control in many judo techniques, the sit-up test evaluates the strength and endurance of the abdominal muscles. Strong abdominal muscles are crucial in judo as they support throws and locks, enable rapid changes of direction, and help to keep body balance [34]. Extremely low core strength test results should prompt the implementation of a preventative strengthening program. Low test results in a clinical environment should be accompanied with mobilisation and strengthening exercises to lower the risk of overuse injuries and muscle strains during judo's throwing phase. Low strength or mobility test results might point to functional dysfunction, which calls for specific movement therapy to improve performance and prevent injury. Tests of agility evaluate an athlete's speed and efficiency in shifting directions fast and accurately [35]. Research-based

agility tests, especially the side step test, require athletes to move from side to side as quickly as possible within a set time. These tests help to identify judo players. Flexibility tests help assess an athlete's ability to perform judo techniques requiring a full range of motion, such as throws and locks [36, 37]. A significantly below-average test may indicate excessive muscle tension and a limited range of motion, increasing the risk of injury. Particularly in the hamstring, lower back, and hip muscles which are crucial in judo technical motions low flexibility raises the risk of injury. Development of remedial training programs and avoidance of injuries depend on early identification of poor flexibility scores. Dynamic balance tests and other balance tests are excellent evaluations of an athlete's capacity to keep bodily equilibrium while moving [38]. Dynamic balancing tests show athletes' capacity to keep control of their bodies under circumstances needing fast coordination and corrections. Poor test results indicate a higher risk of fall-related injuries, including to the ankle, knee, or head. Results of the balance test show postural stability and neuromuscular control; they might also show a risk of damage from dynamic instability. These results enable physiotherapists to design rehabilitative and preventative programs tailored to the needs of young judo athletes.

Used to ascertain judo athletes' aerobic capacity [39], the Harvard Step Test is a cardiovascular endurance test. In judo, cardiovascular endurance is essential as competitors sometimes confront matches with periods of intensive effort followed by short rests.

Moreover, in judo, competitors' technical talents and particular abilities in several spheres of the sport are evaluated using a skill test or branch test [40]. The results of this study allow for evaluating judo athletes' skills using various test items. Among them are mae ukemi kneeling position, judgeri/mae mawari ukemi, yoko ukemi laying position, yoko ukemi squatting and standing position, ushiro ukemi sitting position. Sports physiotherapists can monitor an athlete's physical adaption development and customise an injury prevention strategy for every single person using the findings of physical tests. Early identification of functional deficits made possible by regular monitoring helps training programs to be catered to the particular requirements of the growing athlete.

Conclusion

According to the research, the test items for identifying judo talent in children aged 10 to 13 are: (1) height, (2) fat, (3) weight, (4) sitting height, strength test (5) wall sit, (6) push up, (7) back up, (8) sit up, Agility (9) side step test, flexibility test (10) sit and reach, balance test (11) dynamic balance test, endurance test (12) havard step test, skill test/branch (13) ushiro ukemi sitting position, (14) yoko ukemi lying position, (15) yoko ukemi squatting and standing position, (16) mae ukemi kneeling position, (17) jugeri/mae mawari ukemi.

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