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Designing E-Coaching Program to Improve Understanding of Basic Techniques for Early Judo Athletes

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ABSTRACT

Early childhood is the right time to start practicing body movements, one of which is through sports. In this modern era, technology is growing every minute, including in the world of sports science and technology. This study aims to build a website-based E-Coaching training media as a medium for children to practice independently. The multimedia development uses waterfall method, which consists of six stages, namely the stages of 1) Requirements, 2) Design, 3) Implementation, 4) Testing, and 5) Maintenance. In the multimedia development process, researchers conducted a validation from the experts to test the teaching materials and the media. The training media that was built was implemented for two children who were the objects of Judo practice research. Based on the research results, the use of E-Coaching training media can improve children's skills in making Judo techniques.

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1. INTRODUCTION

Sports can help children's growth and development. With sports, children can learn to build teamwork, train decision making, and communication skills. Sports also allow children to channel energy, foster competitiveness, and minimize aggression in social interactions (Curry, T. J., 2008). From a neurological standpoint, the times of maximal brain growth during childhood. Such developmental 6-8 years and 10-12 years of age appear to correspond with the LTAD model's ''windows of opportunity'' for physical literacy tasks (basic and sports specialized) (Ford, et al., 2011).

Judo is one of the sports that requires coaching from an early age, but Judo coaching in Indonesia lags far behind other countries. According to Sugiri Wijaya (Member of Comittee in PJSI West Java), the development of early childhood athletes is very important. For the sake of forming superior athlete seeds, athletes need to be nurtured and trained with good and appropriate training methods from an early age. The spread of Judo among children in the West Java region is among the largest in Indonesia, but the lack of training support media for children and lack of competition among early childhood causes obstacles in early childhood coaching (Sugiri Wijaya, Private Interview, March 16, 2019)

Providing an understanding of basic techniques is an important point in coaching Judo in early childhood, since basic techniques are fundamental for athletes to be able to perform a precise and efficient movement. Ardiyansyah et al. (2013) wrote about how important the basics of technique in Judo martial arts, as an effort to take perfect technique in the match in order to get the highest points and avoid unwanted injuries. To support the success of periodization in the athlete coaching phase, basic techniques are basic or fundamental for Judo athletes to achieve perfection in taking techniques and performing other techniques at the next level.

From some of the explanations above, a web-based learning multimedia which applied the Long-term Athlete Development (LTAD) training method is expected to help early age athletes to understand basic Judo techniques and be able to practice them during training as an effort to improve athlete performance during matches. An E-coaching website can help the process of training children. With synergies built together between athlete and trainer, it is not impossible for our athlete to bring the good name in Judo for Indonesia.

While Geissler (2014) said this training system is almost the same as training in general, the difference is that it can occur a distance training process that makes E-coaching more impactful and saves time than face-to-face. E-coaching is divided into four types, namely video, telephone, chat (SMS, etc), and e-mail. According to Udi, U. (2018) Website is one application that contains multimedia documents (text, images, sound, animation, video) in it that uses the hypertext transfer protocol (HTTP) protocol and to access it using software called a browser. Some types of browsers that are popular today include: Internet Explorer produced by Microsoft, Mozilla Firefox, Opera, and Safari produced by Apple (Fridayanthie, et al., 2016).

According to Sterkowicz-Przybycień, et al (2018), the results of his research show that in many countries in the world, Judo sports training is given from preschool age, Because the philosophical structure of Judo education (Ju: Gentleness, Flexibility, Do: Path; the path followed to achieve a goal) can be seen as a separate factor in contributing to the value of a child's education. When we review literature studies, it is seen that skilled athletes must be

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trained for at least 10 years or 10,000 hours to achieve sports perfection, and this process is referred to as the '10-year rule' (Belikan et al., 2022). According to discussions with experts, basic technique is fundamental and an important point for a Judo athlete to perform a technical movement and avoid injuries caused by mistakes in taking technique. In Go Kyo I, which is the basis of the movement of the technique at the next level, it is taught how to take the technique from both feet still on the mat. So that if the understanding of basic techniques is good, the athlete will be easier to do the next technical movement.

2. METHODS

Based on the problems before, the test method in this study uses qualitative research methodology. According to Fani, M., &; Tranggono, D. (2023) qualitative research as a scientific method is often used and carried out by a group of researchers in the field of social sciences, including education. This study aims to determine the increase in children's understanding of basic Judo techniques through E-Coaching training media. Media development is done with the Waterfall model, this model is expected to be an overview for the project, but this can also be modified or expanded to meet needs. This model describes the phases of creating a software project, but does not eliminate the constructive approach to the design or development of individual projects.

The population used in this study was children who practiced Judo fostered by Unitex Judo Club in Bogor. The sampling technique used is purposive sampling technique, also called judgment sampling, which selects participants based on their quality (Etikan, Musa, & Alkassim, 2016). The sample in this study was children who practiced Judo fostered by Unitex Judo Club Bogor. The sample criteria needed for this study include; (a) Children aged 4-9 years; (b) Children practicing Judo from Unitex Judo Club. From those criteria, two people are selected. Qualitative data analysis is inductive, which is an analysis based on the data obtained.

The implementation of data validity checking techniques in this study is based on credibility tests. In the credibility test, researchers make more careful and continuous observations by reading various book references, the results of previous research through both national and international journals. The credibility test is carried out by means of Triangulation. Triangulation is defined as a data collection technique that combines various data collection techniques and existing data sources.

3. RESULTS AND DISCUSSION

The design of this WEB based E-Coaching training media uses the Waterfall model Waterfall models have an important place in software engineering. This model is the most widely used and oldest software engineering paradigm. Another reason for using the waterfall model method in the E-Coaching Program Design is the very limited number of software developers. In addition, the stages of the waterfall model take basic activities that are used in almost all software development, so that it is suitable in developing software that is not overly complex. Waterfall model has six different process phases such 1) Requirements, 2) Design, 3) Implementation, 4) Testing, and 5) Maintenance (Binarso, et al., 2012).

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3.1. Requrement Stage

From this Requirement stage, a learning media model for early childhood is obtained. The training media model in **Figure 3.1** that the researchers developed is based on literature studies and observations of needs in the field. The model of learning media for early childhood can be seen in the following scheme.

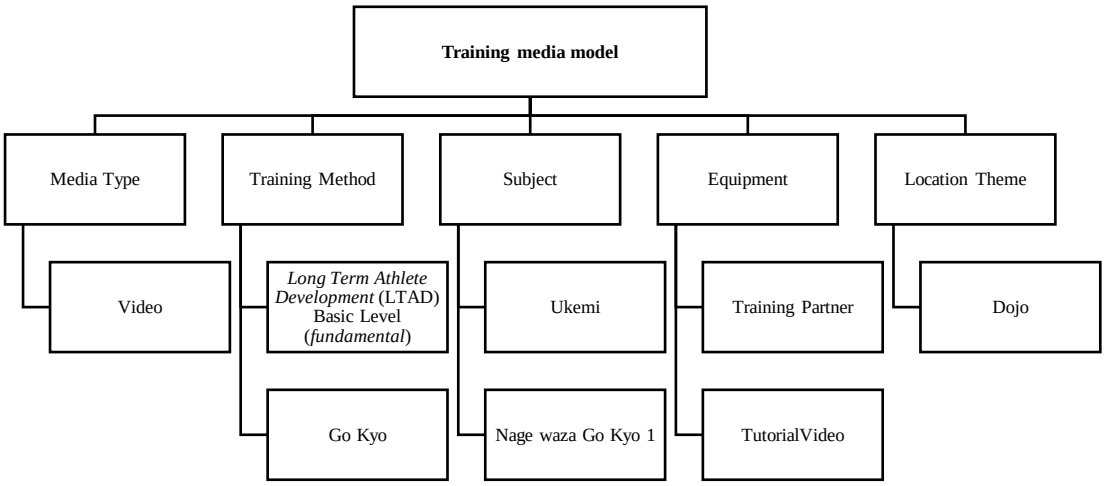

Figure 3. 1 Training Media Model

A. Object

The object of this study is an early Judo child fostered by Unitex Judo Club Bogor City, with an age level of 4-8 years. The place of research conducted is at the Unitex Judo Club Dojo in Bogor, West Java, Indonesia.

B. Material

In the training media made there is Go Kyo 1 material which is a basic technique for beginner Judo, the material will be given to early childhood. In this phase in accordance with the Fundamental stage in Long Term Athlete Development (LTAD) where children under the age range of 9 years are at the Fundamental stage by strengthening the basics of techniques to prepare to continue to the next level of technique. The material to be given is Nage-waza (Throwing techniques).

C. Props

The teaching aids used in this media are training partners and E-Coaching video tutorials. It is chosen according to the analysis of the needs of children and coaches of Judo sports activities that require variety and exercise aids that are packaged using video tutorials to increase interest, overcome boredom and help exercise participants in the process of understanding the material.

D. Location theme

In this media, a location is chosen for the theme. It is done to adjust to the props used. The location theme that is determined is the Dojo or a special place to practice Judo.

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3.1.1. Design Stage

The design of this training media is adjusted to the characteristics of E-Coaching which begins with the preparation of material, training models, preparation of instruments, flowcharts, and storyboards.

3.1.2. Development Stage

This stage is the stage of developing training media. This stage is divided into several parts of the stages of creating a multimedia interface. The creation of website-based E-Coaching training media is made with PHP 7 programming language and uses Apache local server. This E-Coaching training media also uses CodeIgniter 4 framework for backend, and Bootstrap for User Interface.

3.1.3. Implementation Phase

The research was carried out at the Unitex Judo Club Bogor City, the time of the research followed a special training schedule for beginners for 3 meetings, from June 27, 2020 to September 15, 2020 for samples determined by purposive sampling of two people, implementation of training activities using E-Coaching. In the implementation phase, researchers have designed an exercise program. The design of the training program is made with the aim that the training process carried out can be carried out.

In the training process, there are three practical tasks for taking techniques, these three tasks are then sent through web-based E-Coaching media to be checked by the trainer. In the training process, researchers used web-based E-Coaching media instead of the conventional training methods used at Unitex Judo Club. Afterward, the researchers also distributed an assessment questionnaire for users to assess the feasibility of web-based E-Coaching training media. The result obtained from four respondents, consisting of Head Coach assessments was getting 91.4%, Senior Athletes getting 91.4%, Coaches getting 91.4%, and assessments from Athlete Parents getting 94.28%. From the results of the assessment above, it got an average result of 92.12% and was declared to be included in the "Very Good" category.

3.1.4. Verification Phase

At this media verification stage, the validation of material and media experts by lecturers of Computer Science Education and lecturers from the Faculty of Sports and Health, Universitas Pendidikan Indonesia who is also a Judo trainer as well as part of research and development of the Regional Board of the All-Indonesia Judo Association (Pengda PJSI), West Java. The verification phase is carried out to find errors with incorrect functions, interface errors, and performance errors. Validation is carried out in all frames contained in the training media. Validation of media and material experts using LORI assessment. The results of media validation from media experts are as follows.

Validation from material experts obtained Content / Material Quality Aspects of 100%, Learning Aspects of 100%, Feedback and Adaptation Aspects of 100%, and Design Presentation Aspects of 100%. So that the average value of the percentage obtained from material expert validation is 100% with the predicate "Very Good". Validation from media experts obtained the percentage of Presentation Design Aspects by 100%, Use Interaction Aspects by 81%, Accessibility Aspects by 90%, Reuse Aspects by 80%, Aspects Meeting International Standards by 80%. So that the average result of media expert validation percentage is 86.2% and is included as the "Very Good" category.

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3.1.5. Maintenance Phase

At the maintenance stage, after the training media is operated and validated. There are some shortcomings that must be corrected and perfected.

3.1.6. Assessment

The data on the results of improving the skills of taking techniques is the value of participants after carrying out the tasks given in the exercise using E-Coaching media, which is then calculated on average from the three values to see the improvement in participants' basic technique retrieval skills.

The results of skill improvement assessment data obtained from the application of E-Coaching in early childhood Judo training were obtained from several tasks given by the coach.

3.2. Discussion

The improvement of children's skills in training in taking basic techniques is measured based on the results of the assigned tasks carried out at the implementation stage. Based on the results of data processing, the average value of the three assignments given for taking the De Ashi Harai, O Uchi Gari, and Ippon Seoi Nage techniques obtained the following results:

The average score of the first task in the De Ashi Harai technique retrieval practice was 67.5, the average value of taking the O Uchi Gari technique was 67.5, and the average value of taking the Ippon Seoi Nage technique was 72.5. There was an increase in grades on the second and third tasks. The following **Figure 3.1** is a comparison of the value of the first task, the value of the second task, and the value of the third task from Child K.

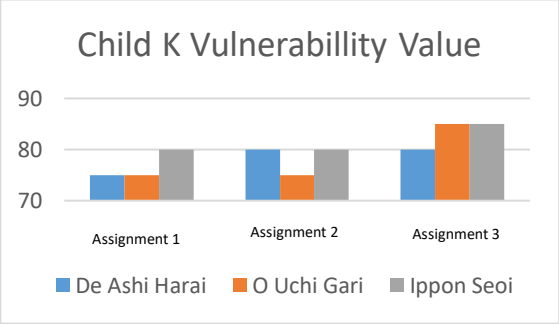

Figure 3.1 K Child Skill Value Graph

The following **Figure 3.2** is a comparison of the value of the first task, the value of the second task, and the value of the third task from Child D.

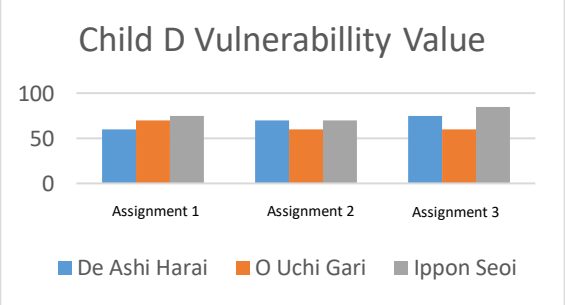

Figure 3.2 Child D Skill Value Graph

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The following **Figure 3.3** is a comparison of the value of the first task, the value of the second task, and the value of the third task from from Child K and Child D.

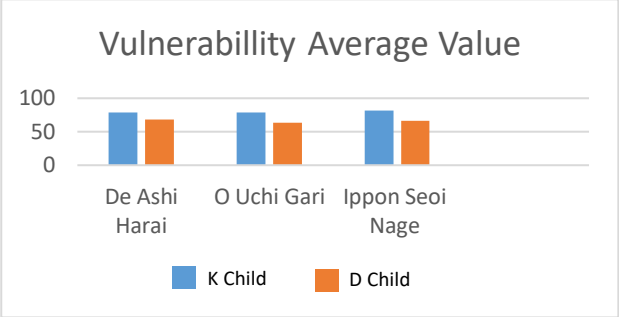

Figure 3.3 Increased Skill Value of Children

1. The first assignment score of De Ashi Harai technique got an average score of 67.5, O Uchi Gari technique got a score of 67.5, Ippon Seoi Nage technique got a score of 72.5.
2. The second assignment score of the De Ashi Harai technique got an average score of 75, O Uchi Gari 67.5, and the Ippon Seoi Nage technique got a score of 70.
3. The third assignment score of the De Ashi Harai technique got a score of 77.5, the O Uchi Gari technique got a score of 77.5, and for the Ippon Seoi Nage technique got a score of 80.

Based on **Figure 3.1** and **Figure 3.2** there is more improvement in the Ippon Seoi Nage technique, this is due to the lack of training given in taking the De Ashi Harai and O Uchi Gari techniques and the difficulty of understanding the movement patterns of the hands and feet in both techniques. Learning basic techniques does require a long time, saturation and requires more exercise frequency while being guided by a trainer. Limited time between the child and the coach, and also the lack of focus of the child on the example given by the coach causes the training process to be less than optimal. For example, when the trainer gives an example of taking techniques, if the child feels that he has a deficiency in the pattern of hand movements, the child's attention will focus on the hand, and forget to focus on the foot, as well as if the child feels a deficiency in the footwork pattern, then the child's focus will be on the foot.

It can be seen that the value of the first task of participants' skills in taking the De Ashi Harai and O Uchi Gari techniques has a smaller value than the Ippon Seoi Nage technique, this is due to the child's lack of understanding in terms of taking techniques, due to children's difficulties in understanding the pattern of hand and foot movements when taking the De Ashi Harai and O Uchi Gari techniques. For example, when taking the De Ashi Harai technique, the coordination between hands and feet must be in accordance with the Kuzushi that has been learned in the early introduction to the sport of Judo before learning the technique. Kuzushi itself is a way to eliminate the balance of opponents in taking techniques in the sport of Judo. This can affect the results of taking techniques and the basic capital to learn techniques at a higher level, but it can be perfected by providing a more detailed understanding of techniques, especially in the hands and feet when practicing technique taking.

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In the training process using E-Coaching training media, children gain knowledge about how to take techniques in detail and how to practice alone without opponents. Children can also listen to examples of taking techniques in the form of videos of how to take techniques contained in the E-Coaching training media. So that in the training process children can perfect in terms of taking techniques, especially in the pattern of hand and foot movements which are quite difficult to understand when seeing the technique taking directly.

Children gain knowledge about the procedures for taking techniques, children have also listened to examples of taking techniques, and have also practiced how to take techniques. The children's techniques gradually begin to be more refined from Kumikata, Kuzushi, hand movement patterns, footwork patterns, and body movement patterns at the time of taking techniques. Previously at the time of taking the De Ashi Harai technique, the child's foot was not perfectly straight when sweeping the opponent's foot, now the child's foot can be perfectly straight when sweeping the opponent's foot, and the pattern of hand movements that can adjust the Kuzushi well so that the result of the slam makes the opponent fall properly and correctly on the mat. Likewise in the technique of O uchi gari and Ippon Seoi Nage which have different patterns of hand and foot movements.

From the results of the average score, it can be concluded that with the help of E-Coaching training media, children 's skills in taking De Ashi Harai, O Uchi Gari, and Ippon Seoi Nage techniques have increased because children can pay more attention to the details of hand and foot movement patterns when taking techniques by repeating sample videos contained in the E-Coaching training media.

4. CONCLUSION

After carrying out research, the researcher can conclude the following: (a) Designing and developing a website-based E-Coaching training media can be done with a waterfall model, development of E-Coaching training media software This website-based includes: requirements, design, development, implementation, verification, and maintenance; (b) Design is carried out by making an analysis of software and hardware requirements. Followed by creating a flowchart and storyboard based on the results of previous analysis. Then with the development process using PHP 7 programming language which is then validated by media experts and experts. After that, the implementation of E-Coaching training media and assessment of E-Coaching training media by users was carried out; (c) The use of E-Coaching training media can improve children's skills in taking basic techniques. By presenting the material using video, it attracts the attention of children in focusing the movement patterns of hands and feet in taking more detailed techniques by repeating the video. Giving tasks to children makes parents know what material is given to children, so that parents can participate in monitoring the development of their children's achievements and are expected to participate in supporting the improvement of children's achievement.

Based on the results of research on website-based E-Coaching training media can increase more understanding of the procedures for taking basic techniques in Judo. This is because the skill in taking basic techniques is the initial capital for learning the next technique that has a higher level of difficulty, and also the practice of basic techniques that take a long time tends to saturate. So that with the web-based E-Coaching training media and the material displayed in the form of videos can increase children's understanding in the procedures for taking techniques, which is supported by a function that presents videos in detail of hand and foot movement patterns which is an important component that is often forgotten by children. Due

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to limited training time so that the improvement that occurs is only small. Therefore, the researchers recommend adding an algorithm feature that can analyze motion patterns in videos so that they can evaluate whether the techniques carried out by children are appropriate according to the Go Kyo learned, adding dynamics to the website to make it more accessible via smartphones. The children can practice independently and the improvement that occurs can be even better.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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