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FEASIBILITY TEST OF MANIPULATIVE COMPONENT BASIC MOVEMENT SKILL TEST INSTRUMENT TO IDENTIFY CHILDREN'S TALENT IN SPORTS

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Abstract

The basic movement skill test kit is one of the dominant factors influencing the development of movement skills in children. The purpose of this study was to examine the feasibility of sensor-based and Internet of Things/IoT basic motor skills test instruments for preschoolers. The developed instruments can carry out valid and reliable, objective, easy, effective, efficient and practical assessments and can be utilized by PAUD, Kindergarten, early childhood trainers and Physical Education Teachers. This type of research is research and development (R&D). The first stage is designing and creating an IoT-based tool system that can measure basic movement skills and display them on the website. The second stage is to characterize and test the feasibility of the system that has been built. The results of the study showed that from the validation process carried out by material experts who had assessed the basic movement skills instrument products, sensor-based manipulative components and the Internet of Things/IoT in terms of the suitability of material and media aspects, they were in the category of very feasible to use, while in the validation process media experts who have assessed the products that have been developed based on the Media Feasibility Aspect are included in the very feasible category for identifying children's talent in sports.

Keywords: Feasibility, Instruments, Talent, Children.

INTRODUCTION

Motor skills are an essential part of the physical education program in preschool. These skills are required for children 3-8 years old, and they are specific and complex basic skills for play, sports, dance, gymnastics, outdoor education, and recreational activities. [1- 3], [10]. By 5-6 years, children will have mastered several motor skills, supported by improved sensory-perceptual abilities. They can walk, run, pick up, and manipulate objects. The child's motor skills, which develop at an early age, significantly impact physical activity later in life. [4], [5].

Early life is the most critical period in a person's life span; if a child experiences obstacles in movement, it will cause delays in the development of other aspects [6-7]. Movement is the main element in developing children's basic movement skills. Therefore, children's motor development will be seen through their various movements, such as crawling, creeping, walking and jumping [8]).

A suitable and good movement activity program can shape and develop children's basic movement skills [9]. Humans need motion to work and defend their lives from threats from their environment; without the ability to move, humans find survival difficult [10], [11].

The study's results stated that 36.07% were in the low category, and 18.98% of children's basic movement skills were in the low category [12]. This data is reinforced by the findings of Bakhtiar [13], which states that boys and girls in rural and urban areas in West Sumatra are severely delayed in locomotor skills and control of objects. Movement delays if left unchecked, will cause several pathological threats, such as: Asymmetric movements, persistence of primitive reflexes, hyper/hypotonia or muscle tone disorders, hyper/hyporeflexia or body reflex disorders, and uncontrolled movements [14]. Furthermore, children's low basic movement skills will cause impaired function of the five senses, body defects, obesity, impaired imitation movements, malnutrition [15], impaired body balance, and slow reaction and coordination.

There needs to be a test instrument for the Fundamental Motor Skills of the Manipulative component integrated with the Internet in evaluating children's motor abilities, which is a fundamental problem in this study. This problem can be solved by creating an Internet of Things (IoT)-based Fundamental Motor Skills test instrument. Various applications and needs have now been developed using IoT, such as the Design of E-Commerce Website for Sales of Sports Equipment [16] and the Design of Website-Based Sports Facility Mapping Application (PSO) [17]. By utilizing the advantages of IOT, all motor skills test results can be appropriately recorded on the website and processed as information on the development of children's motor skills.

Motor learning innovation refers to demands that are integrated with information technology according to the needs of the digital era [18-22]. Motor learning at this time requires development in the form of applications or sensor technology that can facilitate the learning process to be innovative, exciting, and practical. Integrated sensor systems are relevant in supporting learning [23]. Motor skill development is a potential mechanism to reduce the negative impact of physical activity, health, and obesity rates [24-25]. The Internet of Things (IoT) is widely used in today's technological development. IoT can be defined as communication between one device and another using the Internet. This advancement in IoT technology can facilitate various kinds of work [26]. The Internet of Things (IoT) is used in devices and products that require connections, such as wireless sensors, smart meters, and home automation systems. The quality of an IoT product can be seen from several parameters, namely low power consumption, more extended range, wireless connectivity and higher data processing capabilities [27]. The Internet in the world of sports can be used by utilizing the data contained in a website. A website is a visual part of the Internet, a web application because it can perform specific actions and help you perform certain activities [16]. A website is an application containing multimedia documents (text, images, sound, animation, video) containing the HTTP protocol [28].

METHODS

The development of the Fundamental Motor Skills test instrument for Manipulative components integrated with the Internet of Things (IoT) will be carried out in one year. There will be several research stages, which include exploring potential problems, data collection, product design, procurement of components, assembly, measurement of system performance, and field testing. The type of research is research development (RnD) [29].

The instruments used are questionnaires and evaluation sheets. Product validation is given to material and media experts to get input and recommendations. The validation sheet assesses the feasibility of determining the Manipulative component of the Fundamental Motor Skills test instrument. On the material and media expert validation questionnaire sheet using a Likert scale, a psychometric scale commonly used in questionnaires. This research instrument is an assessment sheet regarding the feasibility of the Manipulative component of the fundamental movement skills test instrument. The instrument was prepared to determine the quality of the media that had been developed. The assessment was conducted through an assessment questionnaire by material experts, totalling 5 (five) experts, and media experts, totalling 3 (three) experts. Quantitative data from the validation of material experts, media experts and respondents are then converted into qualitative data on a scale of 4 using the conversion reference [30].

RESULTS

The first stage in research and development is the process of making products. Suppose the product designed through the Flowchart flow has been developed into a software-based product. The next step is to carry out the validation stage of the product created; experts / Expert judges carry out the validation stage.

In this study, material experts are experts on the fundamental movement skills of manipulative components, and media experts are experts in information and digital media with an assessment of products made based on sensors and the Internet Of Things / IoT.

1. Material Expert Validation

Material expert validation is one of the procedures used in research and development; by providing instruments developed to experts in fundamental movement skills of manipulative components, material experts are given a questionnaire that has been available to provide assessments and suggestions for instruments that researchers have developed. The questionnaire was given to five expert lecturers in the field of fundamental movement skills of manipulative components consisting of two aspects assessed by material experts, namely Material Aspects and Media Aspects.

a. Results and Analysis of Material Expert Validation

Questionnaires were given to material experts in the form of an assessment containing score data on a scale of 1 - 4. On the assessment sheet, some suggestions and criticisms provide input to researchers to revise the products that have been developed; the following is a conversion table for Material Aspects and Media Aspects.

Table 1: Assessment Score Conversion for Material Validation

Guide	Score Interval	Category
Material Aspects	X ≥ 33	Very Suitable / Very Appropriate
	33 > X ≥ 27,5	Appropriate / Feasible
	22,5 > X ≥ 22	Not Appropriate / Not Appropriate
	X < 22	Highly Inappropriate / Highly Inappropriate
Media Aspects	X ≥ 27	Very Appropriate / Very Appropriate
	27 > X ≥ 22,5	Appropriate / Feasible
	22,5 > X ≥ 18	Not Appropriate / Not Appropriate
	X < 18	Strongly Unsuitable / Strongly Inappropriate

The table above is a conversion table for the results of the material expert assessment, the assessment sheet for the Sensor-based manipulative component essential movement skills instrument and the Internet Of Things / IoT, which has been given to the material expert and has been assessed, collected back to be counted and then totalled to classify according to the material expert assessment score conversion table. The results of the assessment of the Sensor Identification and Internet Of Things / IoT material experts can be seen in the table below:

Table 2: Material Expert Assessment Results

NO	Assessed Aspect		Category
	Material	Media	
1	40	34	Very Feasible
2	43	33	Very Decent
3	39	33	Very Decent
4	43	32	Very Decent
5	42	35	Very Decent
Average	41,4	33,4	Very worthy

Table 2 shows the results of the material expert's assessment of the sensor-based manipulative component essential movement skills instrument and the Internet of Things / IoT. The assessed scores are differentiated based on aspects of material suitability and aspects of media feasibility from five material experts with the results of assessment obtained the results of the material aspect assessment of 40, 43, 39, 43, and 42.

The Media Aspect scores from five material experts are 34, 33, 33, 32, and 35. The assessment results are then averaged and grouped based on the Assessment Score Conversion. The average results of the Material Aspect assessment from five experts amounted to 41.4 in the Very Suitable / Very Feasible category, and the results of the Media Aspect assessment from five experts 33.4, which were grouped into the Very Suitable / Very Feasible category.

b. Media Validation Results and Analysis

Media expert validation is one of the procedures used in research and development by providing instruments developed for information and digital media experts. Then, media experts are given a questionnaire that has been available to provide assessments and suggestions for products that researchers have developed.

The questionnaire was given to one expert lecturer in information and digital media, a total of three people. The assessment results can be known after the validator has carried out the assessment process for the instrument that has been developed. At the same time, the aspect assessed is the Media Suitability Aspect. The following is a conversion of the assessment results given by the validator.

Table 3: Assessment Score Conversion for Media Validation

Guide	Score Interval	Category
Media Aspects	X ≥ 36	Very Suitable / Very Appropriate
	36 > X ≥ 30	Appropriate / Feasible
	30> X ≥ 24	Not Appropriate / Not Appropriate
	X < 24	Very Unsuitable / Very Inappropriate

Table 3 is a conversion of the score of the assessment results that the media expert validator has given; after the assessment of the instrument, the results have been obtained as follows:

Table 4: Media Expert Assessment Results

No	Media Aspects	Category
1	44	Very Feasible
2	47	Very Feasible
3	46	Very Feasible
Average	45,6	Very Feasible

Table 4 shows the results of the media expert's assessment of the sensor-based manipulative component essential movement skills instrument and the Internet Of Things / IoT. The assessed scores are differentiated based on the suitability aspects of the media aspects from three media experts, with the results obtained from the media aspect assessment of 44, 47, and 46. The evaluation results are then taken on average and grouped based on the Assessment Score Conversion. The average result of the Media Aspect assessment from three experts is 45.6, with the category Very Suitable / Very Feasible.

DISCUSSION

Based on the results of the study, it was found that from the validation process carried out by material experts who have assessed the product of Sensor-based manipulative component basic movement skills instruments and Internet Of Things / IoT in terms of material suitability and media aspects are in the category of very feasible to use, while in the media expert validation process that has assessed the products that have been developed based on aspects of media feasibility are included in the category of very feasible to use to identify children's talent in sports. Talent is one of the most important factors to encourage development in sports achievement [31]. If not done early on, the identification of sports talent can interfere with the career glory of athletes and will also affect future talent in the years to come. Talent identification and development continue to receive significant investment from sports organizations, highlighting the importance of efforts in identifying potential elite athletes. The ongoing attempt to unearth future talent is accompanied by a growing number of studies that aim to provide solutions and strategies to optimize talent identification and development [32]. This is done in [33] by identifying IoT/Fog-based sports talent during COVID-19 and COVID-like situations. A six-layer model that can facilitate the identification of sports talent remotely by using various latest Information and Communication Technologies such as IoT. This framework is mobile, widely accessible, scalable, cost-effective, secure, platform/location independent, and fast to get the desired results. In addition, the research results [31] show that the main factors affecting sports talent identification include personal physical quality performance, psychological quality, coach knowledge, and sports talent identification policies.

This study's results align with research conducted by [34] that developed an authentic assessment instrument for manipulative basic motor skills in physical education, sports, and health for elementary school students. The study results showed that the instrument has content validity, construct validity, and good reliability. The authentic instrument of manipulative basic motor skills in physical education and sports learning can be widely used as an assessment instrument in learning Physical Education, Sports and Health skills for elementary school students.

Fundamental motor skills can be improved with manipulative games. Manipulative games can stimulate people to be active in performing basic motor skills and fun activities. So, it can be concluded, based on the results of research [35], that manipulative games have a significant effect on improving the basic motor skills of elementary school students. Gross motor intelligence, locomotor skills or manipulative skills were not influenced by gender differences, according to the results of research [36]. The comparison of boys and girls showed no gender differences in gross motor intelligence, locomotor skills, or manipulative skills. However, there were significant differences in gross motor intelligence and locomotor skills in selected girls compared to girls who were not ($p<0.05$). These results suggest that competition programs for girls at preschool age prioritize locomotor development but not manipulative motor skills. Sports programs should be multilateral regardless of the sport that preschoolers participate in. Therefore, preschoolers should be encouraged to develop multilaterally and incorporate tests and exercises for manipulative skills, which can positively impact the child's overall growth (motor, social and psychological) in the future.

CONCLUSION

The results of the study concluded that from the validation process carried out by material experts who have assessed the product of Sensor-based manipulative component basic movement skills and Internet Of Things / IoT in terms of Material Suitability Aspects and Media Aspects are in the category of very feasible to use, while in the media expert validation process that has assessed the products that have been developed based on Media Feasibility Aspects are included in the category of very feasible to use to identify children's talents in sports.

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