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TABLE TENNIS LAUNCHER

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Abstract

The learning of the table tennis course is a practical course where the characteristics are unique so that mastery of basic techniques is highly dependent on doing more repetitions. The correct movement will appear along with the automation of the motion. The purpose of the research and development of this table tennis throwing device is to (1) develop a table tennis throwing tool for the process of implementing table tennis learning, (2) obtain empirical data about the feasibility of the table tennis throwing tool that has been developed. The ultimate goal of this development research is to produce a product in the form of learning media, namely a table tennis launcher that can provide meaningful movement experiences and can help improve basic technical skills to the ability to play table tennis. The method used Research and Development (R&D) methods from Borg and Gall. The research subjects are college students of Sports Education at Universitas Bina Darma. Instrument test used observation and questionnaires. Data analysis techniques were carried out with qualitative and quantitative approaches. This product is produced through the research and development stage. The resulting product is a table tennis ball. Based on the product trial analysis phase, the resulting product answers the needs and becomes a solution for lecturers and students in the implementation of table tennis course learning. Based on the results of validation tests, instrument reliability tests, small group try-out and field try group, this table tennis launcher is feasible and can be used in learning table tennis theory and practice courses.

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INTRODUCTION

Technology can not be separated in carrying out a learning. A teacher/lecturer must be responsive to technological developments, when a teacher/lecturer is less responsive, it will greatly affect the learning experience of his students. Adapting technology in learning is one of the right steps in improving the quality and management of learning. Utilization of media for learning is one form of technological adaptation in learning. Learning media is a means of conveying information to students in a constructive manner, not only theoretically. According to Ramli (2012) learning media actually includes three types, namely (1) teaching aids, (2) teaching aids, and (3) learning resources.

Various weaknesses during the learning process can be found and analyzed to find the right solution, including the table tennis course. Table tennis theory and practice courses are one of the subjects that must be taken by students. Table tennis is a world-famous racket sport and the participants are second rank (Asri, 2017). Table tennis is a small ball game that is unique and recreational in nature which is very popular with children or parents, in the game of table tennis there is no need to take up too large a room, people only provide tables and bats to do table tennis (Herliana, 2019).

Competencies that must be achieved by students are not only in cognitive and affective aspects but also in mastering psychomotor aspects/skills in this case is the ability to basic table tennis techniques. This is a characteristic of the table tennis course that mastery of basic techniques is very dependent on the more repetitions, the correct movement will appear along with the automation of the movement. Motion automation cannot be obtained without repetitive activities. Fitts and Posner's in Edward (2011) which says that :

"In this stage, the underlying knowledge needed to perform skills has been entirely transferred from declarative memory into procedural memory. Learners no longer need to think about how to perform a skill. In fact, over time, learners may even forget exactly how they perform a skill, even though they can do it proficiently".

This means that at this stage the movement produced by them is an automatic movement. This is because it has been given repeated exercises so that the movement looks as if the movement can be done without thinking, even though the results are obtained from continuous practice.

Therefore, the implementation of learning must be student-centered by providing a lot of treatment (table tennis drills) , not more on the number of lecture methods that are carried out. This is in line with the opinion of Kurniawan et al (2018) which says that student centered learning (SCL)-based learning is a very good method in providing opportunities for students to explore their abilities, so that it is not focused on the will of educators or lecturers but on learners.

Based on the results of a preliminary study to obtain data on needs analysis/needs assessment in the field during the implementation of table tennis course learning, it was found that (1) a partner who can throw the ball stably and purposefully is needed, (2) limited learning time so that lecturers cannot do it. drill optimally, and (3) the limitations of the learning media for table tennis courses are one of the obstacles to the learning process running optimally.

Previous research that has been carried out includes research from Syarifatunnisa et al (2017) entitled "Development of microcontroller-based table tennis thrower technology" where

the results of the research are that the thrower is made to have two menus, namely the mode menu (slow, medium, hard, and expert).) and control menu (forward spin, backward spin, slow normal, fast normal, right, center and left). Next is a study from Imaniar et al (2016) entitled "Development of a Table Tennis Ball Throwing Tool (Robodrill IR-2016) for Drill Practice of Drive and Spin Punch Techniques). The result of the research is that the ejection device is produced to train drive and spin shots at an affordable price and can also be recommended for use by athletes/players.

Based on the needs analysis as well as previous research, the researcher feels that there is a need for innovation so that the learning of table tennis courses can be carried out properly so that the objectives and results of a lesson are also achieved properly. Therefore, researchers will develop a table tennis thrower. The hope is that this table tennis thrower is not only for learning table tennis courses, but is also expected to help relevant sports stakeholders (government, local governments, private parties, educational institutions, academics, practitioners and the community) so that in the future they can improve sports achievements in Indonesia.

METHODS

The research method is research and development (R&D) methods from Borg and Gall (2007). The validity test (construct validity) was carried out by experts while the reliability test used SPSS statistics 21. The main objective in this research was to produce a product that can be used for the implementation of table tennis learning so as to improve basic technical skills and play table tennis.

Participants

The criteria for research subjects will be explained in the table below:

Table 1. Research Subjects

No	Research Steps	Total Subjects	Criteria	Instrumen
1.	Preliminary Research	-	● Table Tennis Lecture ● College Student	Interview, Questionnaire, and Observation
2.	Evaluation Expert	3	● 1 person learning expert ● 1 person test and measurement expert ● 1 person media expert	Questionnaire Sheet
3.	Product Trial a. Small group try-out b. Field try group	12 36	● 12 person college students ● 36 person college students	Questionnaire Sheet

Sampling Procedures

The sampling technique in this research is random sampling.

Materials and Apparatus

The data in this research were obtained by experiencing, doing, asking, and observing. Data can be in the form of primary data and secondary data. Primary data obtained through questionnaires,

observations, interviews. Secondary data is obtained through analysis of various types of documents. Sources of data based on data collection techniques, among others, obtained from respondents, the circumstances of certain things or events, the environment or research place, photos, and relevant documents. The data used in the development of this table tennis ejection device is qualitative data, because the data obtained is expressed in sentences and not with numbers. Quantitative data is obtained by changing the qualitative data to quantitative by giving a score to the qualitative data.

Procedures

The procedures and steps in the research are (1) the first time that is determined is the problem or potential that is the basis for developing the model, (2) collecting information as a rationale for making concepts, (3) model making (product design), the form of the design is a tool table tennis lontar, (4) construct validation and reliability test, construct validation is carried out by the expert concerned while the reliability test is carried out in the laboratory on the consistency of the speed and distance of the ball, (5) revision, from the results of expert tests (design validation) and reliability tests, (6) product trials, carried out by practicing table tennis balls with 12 children, (7) revision of product trial results, (8) use trials or larger group tests to 36 children, (9) product revisions second, revisions are carried out by experts, in order to obtain perfect results, and (10) the model can be produced.

Design or Data Analysis

The data analysis technique in the development of this table tennis launcher is to use qualitative analysis techniques and quantitative descriptive percentages. Qualitative analysis techniques to analyze data from experts in the form of input, comments, criticism and suggestions. Descriptive quantitative analysis techniques in the form of percentages were used to analyze the results of data collection from small group trials and large group trials. The percentage formula used by researchers to process data is as follows:

The formula for processing data each subject testing (Nana, 2011) :

$$p = \frac{x}{xi} X\ 100\%$$

Description :

P : Evaluation subject result testing percentage

X : Total answers subject score percentage.

Xi : Total answers maximum in the aspect of subject assessment testing.

100 % : Constant.

RESULT

Needs Analysis

The results of preliminary studies (observations, interviews and documentation) on lecturers and students in order to obtain data on needs analysis/needs assessment in the field during the implementation of table tennis course learning data obtained that (1) a partner is needed who can throw the ball stably and purposefully, (2) the limitations of the learning media for the table tennis course are one of the obstacles to the learning process running optimally, and (3). a lot of learning time is wasted on movement correction while doing drills optimally.

Expert Validation

Expert validation consists of 3 (three) experts consisting of material experts, media experts and test and

measurement experts. Validator is someone who is an expert in their field. The results of the evaluation and validation of material experts obtained a score of 90 with excellent criteria, the results of the evaluation and validation of media experts obtained a score of 88 with excellent criteria, and the results of the evaluation and validation of test and measurement experts obtained a score of 88 with excellent criteria . The results of the experts show that the products made have been made according to the needs (college learning process), portable and economical in price. This means that the product is worth testing.

Tool Reliability Test

This reliability test aims to see the extent to which the product made remains consistent after being carried out repeatedly on the same subject. Consistent here is consistent with the results of distance and speed.

Table 2. Reliability Test

Cronbach's Alpha	N of Items
0.86	100

Picture 1. Table tennis launcher

First Revision Step

After the validation test was carried out by the experts and the instrument reliability test was carried out to measure the consistency level of the tool, a revision was made based on input and suggestions from the experts. The inputs from the experts are: (1) the strength of the tool is due to the use of a large capacity dynamo, (2) the regulation of the ball coming out of the ball holder, and (3) regulating the speed of the ball, do not stabilize the speed. After the product is revised, the product is feasible to be tested in the field.

Small Scale Trial

Small scale trials were carried out in a sports laboratory with a trial sample of 12 people. The results of the trial show that the product is comfortable to use, safe to use, easy to use, easy to carry (portable), helps lecturers in delivering material, is effective and efficient in learning, but there are some inputs that must be improved by researchers.

Second Revision Step

After conducting a small-scale test, it turns out that there are still things that need to be considered by researchers. The thing to pay attention to is the length of the tool's operation with the length of lecture time, this is related to the normal temperature of the dynamo (level of resistance). After the product is revised, the product is tested again to enter a large field trial.

Large Scale Trial

A large-scale trial was carried out in a sports laboratory with a trial sample of 36 people. The trial results show that the product is comfortable to use, safe to use, easy to use, portable (portable), helps lecturers in delivering material, is effective and efficient in learning.

Third Revision Step and Final Product

After receiving input and suggestions from small-scale trials and large-scale trials of the product

development of this table tennis ejection, nothing needs to be revised, all aspects have met the standards and are very feasible to use.

DISCUSSION

Based on the results of research that has been done, this product is feasible to use because it answers the needs based on a need assessment. The table tennis launcher is a tool or machine that throws the ball automatically to students, so that it can help lecturers and students in the learning process. Assist with time management, class management and material management.

This launcher is one of the media in learning. The existence of learning media facilitates interaction and delivery of material to students. However, without the seriousness of the students, they will not get maximum results from learning and training. This is in line with the opinion of Haris (2020) who said that without the seriousness of an exercise you will not get maximum results. In addition, learning media can facilitate various types of learning from students. According to Ramli (2012) there are seven types of student learning, namely visual, auditive, kinesthetic, tactile, olfactory, gustative and combinative.

This table tennis launcher has several limitations including (1) the materials used are not optimal due to the limitations of researchers in finding materials that are suitable for the product being made, (2) the common perception with the team that makes the tool that it affects the time of manufacture.

CONCLUSION

Based on the data obtained from the results of field trials and discussion of research results, it can be concluded that:

1. This product is produced through the research and development stage. The resulting product is a table tennis ball. Based on the product trial analysis phase, the resulting product answers the needs and becomes a solution for lecturers and students in the implementation of table tennis course learning.
2. Based on the results of validation tests, instrument reliability tests, small-scale trials and large-scale trials, the table tennis launcher is feasible and can be used in learning table tennis theory and practice courses.

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REFERENCES

Asri, N., S, & Mukarromah, S.,B. (2017). Pengaruh Metode Latihan Multiball dan Koordinasi Mata Tangan terhadap Peningkatan Keterampilan Forehand Drive Tenis Meja. Journal of Physical Education and Sports, 6(2), 179–185.

Bimantara, A. B. (2021). Pengembangan alat bantu pelontar bola Tenis Meja menggunakan kendali SmartPhone berbasis Mikrokontroller (Doctoral dissertation, Universitas 17 Agustus 1945 Surabaya).

Borg, W.R. & Gall, M.D. (2007)., Educational Research An Introduction. Longman New York.

Edwards, H. Wiliam. (2011). Motor Learning and Control From Theory to Practice. USA : Wadsworth.

Kes, M., & Murniati, S. (2020). *Pengembangan Alat Pelontar Bola Tenis Meja* (Doctoral dissertation, FKIP).

Kurniawan,M. Arif; Agus Miftahillah; Nilna Milhatan Nasihah. (2018). "Pembelajaran Berbasis Student-Centered Learning di Perguruan Tinggi: Suatu Tinjauan di UIN Sunan Kalijaga Yogyakarta". Lentera Pendidikan, 21(1), 1-11.

Melya Nur Herliana. (2019). Pengaruh Bentuk Latihan Menggunakan Dua Meja Terhadap Ketepatan Forehand Dalam Permainan Tenis Meja. Journal of S.P.O.R.T, 3(2), 93-97.

Rachman, Imaniar ,Sulaiman , Rumini .(2017). " Pengembangan Alat Pelontar Bola Tenis Meja (Robodrill IR-2016) untuk Latihan Drill Teknik Pukulan Drive dan Spin". Journal Physical education and Sport, Vol. 6 (1), 50-56.

Ramli. (2012). Media dan Teknologi Pembelajaran. Banjarmasin : Antasari Press.

Satria, M. Haris. (2020). Fartlek Exercise On Aerobic Resistance. Jurnal Kinestetik, 4(2), 134–139.

Santoso, T. (2016). Penerapan Hasil Penelitian Pengembangan Alat Bantu Return Board Dalam Mendukung Pembelajaran Tenis Meja Ramah Anak.

Saputro, H., Subandi, S., & Priyambodo, S. (2015). Robot Trainer Tenis Meja Enggunakan Atmega 16. *Jurnal Elektrikal*, *2*(1), 60-68.

Sudjana, Nana. (2011). Penilaian Hasil Proses Belajar Mengajar. Bandung: PT. Remaja Rosdakarya.

Supratno, S., & Suciawan, I. (2021). Sistem Antarmuka Komputer Berbasis Borland Delphi 7.0 Untuk Pengaturan Lemparan Bola Pada Robot Pelatih Tenis Meja. *JREC (Journal of Electrical and Electronics)*, *9*(1), 29-41.

Syarifatunnisa, Kusmaedi, Nurlan, Indri, Nur Rahayu. (2017). " Pengembangan Teknologi Alat Pelontar Bola Tenis Meja Berbasis Microcontroller". Jurnal Terapan Ilmu Keolahragaan, 2(1), 51-55.