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ALAT PRAKTIK FISIKA DENGAN KREATIVITAS SEDERHANA
(PHYSICS PRACTICE TOOLS WITH SIMPLE CREATIVITY)

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ABSTRAK

Riset yang berjudul "Alat Praktek Fisika Dengan Kreativitas Sederhana "bertujuan untuk menjawab semua persoalan yang ada di setiap sekolah yang berhubungan dengan kelengkapan alat peraga yang ada disetiap sekolah di Indonesia (sekarang). Terutama terfokus pada alat praktek konservatif dan non konservatif. Dengan memanfaatkan bahan-bahan yang mudah didapat dan harganya juga murah. Bahan-bahannya seperti Terplek yang menjadi bahan dasar utama dalam alat peraga kemudian komponen lain seperti pegas, beban, dan sebagainya.

Kata kunci :Fisika, Alat, Praktek, kreativitas sederhana.

Abstract

The research entitled " PHYSICSPRACTICE TOOLS WITH SIMPLE CREATIVITY " aims to answer all the problems that exist in each school that is related to the completeness of the props that exist in every school in Indonesia (now). Mainly focused on physics props Conservative and Non-Conservative Style *By utilizing materials that are easily available and the price is also cheap. Materials such as Terplek which became the main base material in props then other components such as springs, batteries, lights, loads, and so forth.*

Keyword**: **Physics, Tools, Practice, Simple Creativitity

1. Intruduction

Science is divided into several branches of science, including Physics. Physics is the most fundamental science because it deals with the behavior and structure of objects. One of the things that need to be considered in supporting the learning of physics so that the delivery of the concept can be better that the availability of adequate facilities such as one in the form of visual aids in accordance with physics teaching materials taught in school. In the process of physics learning in physics teaching aids can clarify the presentation of messages and information about physics lessons delivered by teachers. Physics props are tools specially made for certain physics lessons eg electric and magnet used for electromagnetic lessons, optical props used for optics lessons and mechanical props used for mechanical learning. The use of props physics itself serves to help and facilitate students in understanding a basic concept of many subjects physics lesson which is an abstract lesson. But not all schools have adequate teaching aids to help the learning system in school, especially in physics lessons. The limitations of the school's props are due to the high cost of visual aids and the lack of funds they have to purchase the visual aids. That's why I am doing a new innovation which can solve every school problem in terms of

equipping props. Through this research explained that the tools are simple and easy to obtain can be used as a learning tool based on cheap technology and easy to understand and operated. In addition, this study also focuses on one of the materials in physics, namely "Conservative and Non-Conservative Style", which applications in daily life quite a lot but have no props for this material. Therefore with this research, help improve the education system in Indonesia, especially schools that are still experiencing the problem of the completeness of props.

1. Research Methode

2.1 Research Sites

Physics Laboratory Akademi Maritim Belawan Medan Jl. Kapt.Muslim no.26 Helvetia Timur Medan

2.2. Tools and Materials

2.2.1 Tools

- Saw, Palu, and Tang.
- Ruler, Pencil, and Scissors
- Digital Ampere Meter
- Screwdriver and Shoot Glue

2.2.2 Materials

- Teriplek
- 1 flat Zinc
- 3 pieces of spring
- Load (100 gr, 50 gr, 30 gr)
- Nails
- Copper Wire / Coil
- 8 pieces Battery 1.5 V
- 3 pieces of light bulbs
- Cable
- Switch
- Pingpong Ball

2.3 Working Procedures

2.3.1 First of all a chop saw with:

a. Size 59 cm x 47.3 cm, as the base base of props.

b. Size 30 cm x 24 cm, as a base of spring force props, gravity gravity, and friction.

c. Size 54.2 cm x 30 cm, as the height of the props.

d. Size 27.7 cm x 17.7, as a spring-style props.

e. Size 54.2 x 5 cm, as the side of the props (for the right and left side).

f. Measures 8 cm x 4 cm, as a falling load retainer (for the top left) and 12 cm x 4 cm, as a falling load retainer (for the lower right).

g. Size 4.5 cm x 5.2 cm, as a base. Size 4.5 cm x 1.5 cm, as the right and left sides. Size 5 cm x 1.6 cm, as the back side (base of the load fall).

h. Size 27 cm x 7.5 cm, as a derivative.

i. Size of 28.1 cm x 13.3 cm, as a derivative support.

j. Size 38.6 cm x 7.3 cm, as flat field.

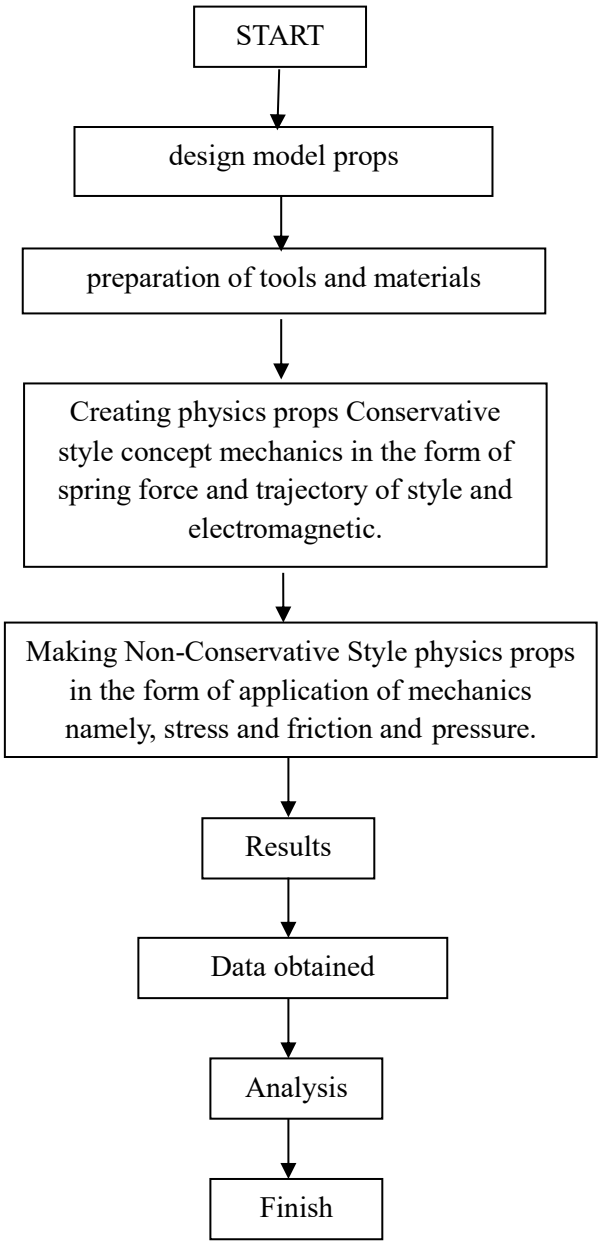
k. Size 8.7 cm x 7.2, as a flat field foot.

l. Size 13.1 cm x 8.5, as a place to switch and buffer derivative at the bottom. Size 18cm x 8.5cm, as cover, Size 34.3cm x 6.3cm, as the right and left lane, the size 21.8cm x 6cm, as the derived path.

Prosedur

1. Cut some parts according to the function. The base and height and the spring props are cut off on the left side by the size of the load. And also the part where the switch is cut to the size of the switch used.
2. Zinc scissors with size 28.8 cm x 6 cm, as a derivative in props as much as 3 pieces. Then bend both sides of the zinc inward to a semicircle.
3. Then raft all the parts together. The base, height, spring props, the right side and left side, and also the load holder into one part of the paste with nails as peyangga use wire or copper. Then spikes 3 springs to the inner part of the spring force props, so that the spring does not fall side of the spikes in the bend to the right or left. After that practice the zinc that has been in the form of a semicircle to the front height of the props.
4. After one component is completed proceed to another component of the derivative path of the fall of the ball. By bringing together the remaining teriplek parts that have been sawed in size in the initial step. The component comprises the component parts of the load receiver that fall on the gravity and friction props. Then the other components are parts that serve as a place where the ball fall and where scalar that will flow the flow of electricity to the lamp.
5. After all parts are finished assembled, then take the ping pong ball. Bolongi a bit of the side then fill with the residue from the sawmill of various materials such as teriplek, pralon pipe and others in order to get a strong texture and like a golf ball.
6. After all components are finished and the ping pong ball also contains residues, then all components are adhered to the base of the props using nails and wire or copper. (Tips: at the time of nailing some components like the right and left side make sure the spikes are in the middle so that the spikes do not come out of teripke that will be united so components are easy to get off.)
7. Then after all the components made of teriplek have been completed in the paste with the base of the props, the next step is to make a series electric circuit to turn on the lights. (In this case applied the principle of voltage and also electromagnetic). The electric circuit used is a simple electrical circuit consisting of only 3 for a 1.5 V battery. And the lamp used is a colorful fluorescent light to add an interesting element in the props.
8. After the electrical components and series flow, then the last thing we do do final testing about the success of props. Then put the load on the spring, put the load on the friction and gravity props and drop the ball that already contains the residue above the derivative and when the ball falls back and presses the switch.
9. After the testing process is complete then finished is the process of making a simple physics props and can already be used in helping the understanding of the material of physics is "Conservative Style and Non-Conservative Style."

Flow Chart


START
design model props
preparation of tools and materials
Creating physics props Conservative style concept mechanics in the form of spring force and trajectory of style and electromagnetic.
Making Non-Conservative Style physics props in the form of application of mechanics namely, stress and friction and pressure.
Results
Data obtained
Analysis
Finish

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2. Result/Discussion

The spring elasticity force has resulted that weight difference differences (100 gr, 50 gr, and 30 gr) suspended in each spring affect the elastic level of each spring. In addition, the load that has the most weight (100 gr weight) is the spring that has the best elasticity than the other two springs (50 gr and 30 gr). Therefore the spring elasticity force is influenced by the mass of the object.

Gravitational force is the result that the force of gravity is constant ie the initial velocity equal to zero ($V_{\circ} = 0$). In addition, the force of gravity is also influenced by the attractiveness of the earth so that any type of object that is dropped will fall down. And the last is the force of gravity is not influenced by the mass of the object, for example when a load of 100 grams dropped simultaneously with a load of 50 gr then both these loads will arrive at the ground at the same time. In this case the implementation of some gravitational law proposed by Ishac Newton, namely:

A. Newton's Law I
B. Newton's Law II
C. Newton's Law III

Electromagnetic results show that each electric current requires a link between the battery with a switch light and the battery can be a good electrical conductor to turn 3 lamps at the same time.

results obtained from Non-conservative styles

Friction or Friction. The result of all trials is the greater weight the friction force will also be greater. In addition, the surface of the friction also affects the resulting friction large or not. The more rough surface will be the greater the friction force while the more smooth the surface will be the less friction generated.

Other contact styles. It is found that every activity undertaken will definitely relate to each other and have contact with other styles. Like the force of gravity combined with friction and pressure.

Pressure and Voltage, that is, when the load down the zinc is made an alloy between gravity and pressure. If there is no pressure then the load will not roll down. Whereas in the case of electric current flow from the battery to the switch it needs the appropriate voltage so as not to happen short circuits that result in undesirable things.

3. Conclution

From the description and explanation as well as some tests that have been done then it can be concluded:That Conservative style and Non-Conservative style consisting of several styles having different properties can each be made in one props so that it saves time and workmanship.Applying the principle of several styles in a props such as a combination of frictional forces with gravity combined in one work and also the gravitational force which is combined with electromagnetic.Previous props of some of these styles are made separately and the work is done one by one but with this innovation all the styles can be made in one props so as to be effective and efficient.Of the several forces applied in the props it is found that one force has a relationship with another. And everything is included in the Mechanics system. Mechanics is part of a physics lesson that studies the basics of Physics lessons.

Suggestions

From the development that I have done I hope that this tool can be accepted in the community well and hopefully this tool can help the performance and development of education system in Indonesia especially in the field of practice and visual. I hope that after this there are more and more new.

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