

Development of Brain Jogging Method to Improve Motivation Learning Outcome of Physical Education on Vocational High School

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ABSTRACT

This study aims to produce a product in the form of modified brain jogging training with an online system. So that it can facilitate the learning process for Physical Education in the era of the covid-19 pandemic. This research is a 4-D development research (Four D) developed. In this study, researchers made modifications through a simplification process. Simplification of the model from four stages into three stages, namely defining (define), design (design), and development (develop). A total of 100 respondents spread across several SMK Kab. Kulonprogo showed the results of the Free Test and Post Test as many as 16242 and 17592, with an average of 162 and 176. To test the normality of the data using the Kolmogorof Smirnov test, the SPSS program. Based on the Kolmogorov Smirnov test, the Kolmogorov Smirnov value was obtained for the free test data, the Sig value. = 0.200 > 0.05, which means the data is normally distributed. Based on the output results of Paired Samples Correlation that the coefficient before and after treatment is 0.930 with a Sig value. 0.00 < 0.05, so the conclusion is significant. In the difference significance test with the help of SPSS software, the results of t-count = -15.334, df = 99 and Sig. (2-tailed) = 0.00 < 0.05. There is an increase in motivation before being given brain jogging exercise and after being given brain jogging exercise. So it can be concluded that there is a significant effect of brain jogging exercise on the learning motivation of SMK Kab. Kulonprogo, Special Region of Yogyakarta.

Keywords: Brain Jogging, Motivation, Vocational High School

1. INTRODUCTION

Physical education is an integral part of overall education through physical education activities that aim to develop individuals organically, neuromuscularly, intellectually, and emotionally [1]. Physical education can stimulate the growth and physical development of students as a whole. Physical education is different from sports, because in education it contains activities that aim to train muscles, enhance coordination, and maintain body health, besides that it also aims to shape the character of students. A physical education teacher not only conveys knowledge, but also educates character and motivates students. In dealing with students, namely students, a teacher must also understand the level of development.

Physical education is a medium to encourage the development of motor skills, physical abilities,

knowledge, reasoning, appreciation of values (attitude, mental, emotional, spiritual, social) and discussion of healthy lifestyles that lead to stimulating balanced growth and development. With physical education students will get various appropriate expressions that are closely related to pleasant personal impressions as well as various expressions that are creative, innovative, skilled, have physical fitness, healthy living habits and have knowledge and understanding of human movement.

Every teacher expects that their students are always successful in the teaching and learning process. Likewise with the District Vocational School students. Kulonprogo is expected to be enthusiastic in participating in Physical Education lessons even though currently the learning is in the online method delivered by the teacher. The online learning process is not easy, because teachers are required to provide

interesting material with materials and methods that are in accordance with the varied character and desires of s so that s are enthusiastic about learning. So far, in providing material, the motivation to learn from s is very important, especially when the Physical Education material is actually interesting when practiced directly. With the pandemic, making the delivery of theoretical material without direct practice plus learning using the online system seems monotonous so that s are less enthusiastic and less motivated in learning.

In Indonesia, there are less developed training models that aim to improve brain function so that it can work more optimally. However, there is one training model that is being developed in Germany, namely brain jogging which is adopted from life kinetics, which is used to train a person's brain organs, including professional athletes. One way to grow motivation is by brain jogging. Because brain jogging is a fun workout, which combines physical activity, brain training, and visualization. Brain jogging is a training such as lifekinetik, brain gym, and brain exercise. But brain jogging is the result of the adoption of lifekinetics in Germany, Australia, and Sweden, and developed in Germany which is used to train a person's brain organs, including professional athletes.

Brain Jogging is a method that specifically helped train the coordination process information via multiple senses [2]. The purpose of the training brain jogging is to stimulate the brain work system so that an increase in cognition / concentration, motivation, intelligence, multitasking (double duty), memory and attention, resistance to stress, and fitness (physical fitness) [3]. The presence of brain jogging training model will be very useful, so as to optimize brain function and enhances critical thinking, concentrate better and focus on performing his duties with passion, hard work, and making quick decisions so that objectives are being achieved well. Brain jogging exercise will accelerate the absorption of information is still able to receive information about the subject matter well and maximal. Jogging brain training exercise is seen as a model from which to improve your skills, cognitive, and mental, given the highly complex motor coordination. Brain Training jogging core containing merges physical training.

The number of special s for the SMK level from 2017 to 2020 has increased, the data can be seen from the following graphic data:

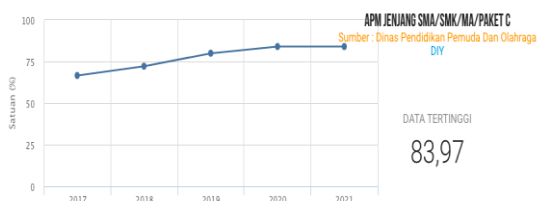


Figure 1. Angka Partisipasi Murni Siswa SMK
Resource: Dinas Pendidikan Pemuda dan Olahraga

From the graphic data, it can be concluded that the increase in the number of s attending school during 2019-2020 has increased. Reinforced by the net enrollment rate (APM) of s to enroll in schools has increased even though the pandemic hit. NER is a description of humans aged 15-18 years who live in certain areas whether they attend school or not. From this absorption, it is indicated that the enthusiasm of s to go to high school is to receive material in 2020.

By implementing online learning, s will spend most of their time at home. They must only be required to study exact subjects, and the rest of the time they spend at home playing *games*. This shows their opportunities for them to move freely are very limited. So, the concerns of academics and practitioners in the world of sports are not excessive because the current generation of s will experience a lot of hypokinetic disease or lack of movement.

In the initial study of preliminary research, researchers used data collection in the form of qualitative data taken from *Forum Group Discussion (FGD)* activities using a *digital zoom meeting platform*. The FGD was attended by representatives of the Principal of SMK Kab. Kulonprogo, coordinator of MGMP PJOK Kab. Kulonprogo, representative of PJOK Kab. Kulonprogo, representatives from parents and representatives from SMK Kab. Kulonprogo. In the event, the topic discussed was the distance learning mechanism that is comfortable for both s and teachers, during a pandemic situation like this.

The conclusion that can be drawn after the FGD is that s need a learning media in the form of learning tutorial videos because through these media s can learn independently what they need to master. The learning media is in the form of offline, offline form due to the opinion of PJOK teachers and school principals that, the characteristics of the location of SMK in Kab. Kulonprogo is not entirely located in a city environment, but is spread out in various corners of the mountains and slopes. So that internet access is very difficult to reach, if the making of learning media is online it will be difficult for both s and teachers who will accompany them. On the basis of the considerations above, the researcher will make a product in the form of a *brain jogging* exercise video to increase motivation to learn SMK in Kab. Kulonprogo.

2. METHODS

2.1. Participants

The sample of this research is the s of SMK Kab. Kulonprogo because the sample is homogeneous and not stratified, the data collection technique using *purposive sampling*. Every high school. Regency. Kulonprogo sampled 5-10 0 people so that the total sample collected was 100 s of SMK Kab. Kulonprogo.

2.2. Procedure

This type of research is research *and development* (R&D). The model used is the development of a 4-D model. The 4-D development model (Four D) is a learning device development model [4]. The 4D development model consists of 4 main stages, namely: Define, Design, Develop and Disseminate. This method and model was chosen because it aims to produce a product in the form of a brain jogging exercise video by hand.

2.3. Data Collection

The product developed is then tested for its feasibility with validity and product testing to determine the extent of its validity and effectiveness. Data collection techniques in this research using interviews, *Group Discussion Forums*, and questionnaires about learning motivation.

2.4. Data Analysis

The data analysis technique used in this study is a qualitative analysis technique with the help of expert judgment who are experts in their respective fields. Expert judgment in this study involved 2 *judgments* from clinical psychology and 2 experts from online-based learning media. The *expert judgment* sheet that has been prepared by the researcher is given to the *judgment* then the *judgment* provides some input and additions to the researcher before developing the *brain jogging* model. Based on input from experts, video tutorials for learning brain jogging through *ball juggling* activities began to be developed.

The product in the form of a *ball juggling* tutorial video consists of level 1 to level 9 with easy to difficult levels. Furthermore, s were given a closed questionnaire containing a questionnaire containing 40 question items about learning motivation. After that, they were given treatment by studying learning tutorial videos. Furthermore, after 12 meetings the s were measured again with the same learning motivation questionnaire to test its effectiveness.

Effectiveness test conducted to determine how much of the effectiveness of video tutorials *juggling balls* that have been made compared with the data before the *pre-test* and the data after a given treatment or *post-test*. According Ghozali (2013: 98) t test is basically used to show how to compare two or more variables. Tests carried out using a significant level of 0.05 level ($\alpha = 5\%$). The hypothesis is done with the following criteria: a) If significant value > 0.05 then the hypothesis is rejected (regression coefficient is not significant). b) If significant value ≤ 0.05 , then the hypothesis is accepted (significant regression coefficient). In the study, all analysis was Carried out with the SPSS Version 22.0 software for Windows, and the statistical significance was set at $P < 0.05$. After the results of efficacy trials discussed in the

Forum Group Discussion with teachers PJOK Kab. Kulonprogo to strengthen the data on the qualitative.

3. RESULTS

Pre Test and *Post Test* data from 100 research subjects on the effectiveness of *Brain Jogging* is shown in the following table:

Table 1. The Paire Research Results

Subject	Pre	Post	Subject	Pre	Post
1	201	208	51	190	190
2	181	199	52	174	188
3	166	188	53	147	162
4	210	218	54	100	100
5	164	196	55	131	151
6	137	161	56	148	168
7	185	207	57	162	172
8	170	173	5*	131	164
9	176	191	59	183	191
10	172	183	60	167	170
11	158	176	61	162	174
12	133	151	62	145	168
13	164	170	63	185	188
14	175	191	64	155	170
15	166	183	65	180	185
16	150	151	66	178	198
17	147	158	67	191	196
18	152	171	68	138	151
19	165	184	69	182	186
20	163	171	70	130	157
21	169	194	71	122	128
22	192	197	72	167	174
23	169	178	73	170	183
24	157	174	74	152	187
25	162	175	75	154	172
26	172	176	76	158	173
27	166	178	77	179	193
28	148	152	78	174	185
29	154	179	79	173	178
30	152	171	80 s	162	177
31	158	171	81	142	167
32	207	209	82	112	131
33	186	197	83	187	193
34	139	149	84	167	189
35	199	199	85	153	175
36	144	151	86	184	202
37	156	168	87	174	183

Subject	Pre	Post	Subject	Pre	Post
38	100	111	88	158	167
39	199	203	89	121	131
40	229	229	90	185	199
41	161	165	91	156	172
42	177	193	92	153	171
43	182	183	93	135	157
44	173	184	94	146	180
45	185	186	95	158	172
46	210	211	96	118	126
47	169	193	97	159	180
48	143	154	98	127	152
49	134	158	99	118	160
50	169	184	100	203	204
Total				16242	17592
Average				162	176

A total of 100 respondents spread across several SMK Kab. Kulonprogo showed the results of the Free Test and Post Test as many as 16242 and 17592, with an average of 162 and 176.

3.1 Normality Tests

To test the normality of the data using the Kolmogorof Smirnov test, the SPSS program. If the calculation results obtained by the probability (p) is greater than the error level (0.05), then the data is normally distributed. Based on the Kolmogorov Smirnov test, the Kolmogorov Smirnov value was obtained for the free test data, the Sig value. = 0.200 > 0.05, which means the data is normally distributed. Meanwhile, the value of Kolomogrov Smirnov for the post test data is Sig. = 0.012 > 0.05, which means the data is normally distributed. Based on this analysis, it shows that the two free test and post test data are normally distributed.

3.2 T-test

Based on the output using SPSS that the average value before being given treatment was 162.42 and after being given it was 175.92. This means that the average value after being given treatment shows an increase. Based on the results of the *Paired Samples Correlations* output that the coefficient before and after being given treatment is 0.930 with a Sig value. 0.00 < 0.05, so the conclusion is significant. In the difference significance test with the help of SPSS software, the results of t-count = -15.334, df = 99 and Sig. (2-tailed) = 0.00 < 0.05. This means that there is a significant difference between before and after being given treatment. Based on this information, it can be said that the developed *brain jogging* activity is effective and can increase the learning motivation of the students of SMK Kab. Kulonprogo.

Brain jogging exercise is proven to increase the learning motivation of SMK Kab. Kulonprogo because, this exercise model contains movements that stimulate the brain to maximize its abilities. The stimulation given will encourage the central nervous system to secrete hormones. The hormone that is needed in carrying out activities is the hormone serotonin. The body's production of *melation* (a hormone produced at night) will be replaced by the production of *serotonin* (a hormone that is only produced during the day). The *serotonin* hormone has the function of influencing psychological balance and regulating body temperature so that humans are cheerful and calm [5].

One way to increase these hormones is through physical activity in the form of *brain jogging* training. The obtained results can be explained by the fact that the *brain jogging* exercises based on stimulation of various brain systems (optical-motor, kinesthetic, auditory, visual) increased the flow of sensory information passing through the nervous system, stimulate the work of superior brain functions (speech, gnosis praxis), thereby enhancing the neuroplasticity properties that affect the level recovery of short-term memory, performance of associations [6].

This hormone functions as a neuro-transmitter (signal carrier) that will be produced when a stimulus occurs to brain cells. "As a result, the hormone serotonin is essential for the human body because it helps manage a happy and positive mood, including preventing depression. A study revealed that serotonin levels' imbalance affects mood disorders that lead to stress, even depression" [7]. Other opinions support that this hormone will motivate a person to work hard to achieve goals and make a person more alert and focused on the task to be achieved [8].

One of the motivations that can be built from within is intrinsic motivation. Intrinsic motivation must be owned by all students, because they have the ability to focus on the growth and improvement of their competencies based on fun, joy, and satisfaction for their involvement in understanding the material provided by the teacher. Students who have intrinsic motivation have the ability; "Motivation to do learning is important in doing learning activities because intrinsic motivation is the driving force that can give birth to one's activities [9].

Students will be more enthusiastic to complete a task because there is a strong motivation that arises from within themselves. Motivation as a trigger in changing the energy in a person into the form of a real activity to achieve certain goals. In other words, the individual is motivated to have an attitude towards the goals he wants without any external (extrinsic) driving factor. To bring up the motivation, there needs to be a stimulus so that the brain translates it into a response. Stimulus is a trigger or command to the brain to perform a certain command [10]. The right

psychological training method to be given to athletes in every training session, one of which is *brain jogging* training. [11] added, with *brain jogging* students can improve their mental abilities and the ability of the human nervous system.

3.3 Product Videos

The research product aims to stimulate the brain's working system so that there is an increase in cognition, senses, and mental power. In more detail, the goals to be achieved from *brain jogging* exercises are to increase concentration, motivation, intelligence, *multitasking*, memory/attention, resistance to stress, and physical fitness [12]. Motivation will grow well if there is a stimulus and response. This stimulus and response will produce hormones via the hypothalamus. Increase serotonin hormone, serotonergic (5-H) neuron serotonin hormone can reduce anxiety, tension and pain. Serotonin can be increased through alternating activities or movements [13].

In the learning video tutorial material contains levels 1-9 which are arranged by researchers from easy to difficult levels. The reason for putting the easy level at the first level is none other than the theory of training speed of motion by [14] that the motion is carried out from simple to complex, from easy to difficult, and from slow motion to faster. The hope of the researcher is that students can gradually master until they reach the maximum level.

In each level, slow motion is given with the aim that the slower the movement, the easier it is for students to imitate and learn it. The Purpose of Using Video Media The purpose of learning to use video media includes cognitive, affective and psychomotor goals. [15]. Cognitive goals can develop cognitive abilities that involve the ability to recognize and the ability to provide stimulation in the form of motion and sensation. And can show a series of still images without sound as well as photo media and frame films.

While the Affective goal By using effects and techniques, video can be a very good medium in influencing attitudes and emotions. The attitudes and emotions of students who see the video show will be calmer and feel entertained because of the presentation of moving images so that they just follow what movements will be shown. In the video there is also a voice from the narrator who helps students to learn the movement independently and the keys to the movement will also be conveyed in the video product.

The purpose of Psychomotor in video products is an appropriate medium to show examples of skills related to movement. Movement can be slowed or accelerated. Through the media, students immediately get a visual vision of their abilities so that they try the skills related to the movement. Benefits of Using Video Media The benefits of using video media include [16].

Provide unexpected experiences to students. And show clearly something that was initially impossible to see. As well as presenting case study presentations about real life that can trigger student discussion. With the video media, students can witness firsthand a wrong movement or a perfect movement that the teacher cannot imitate. Students can also play back video media according to their needs and needs. In a distance learning situation where not all SMK in Kab. Kulonprogo has good internet access, so the *brain jogging* exercise video is designed to be learned offline. Because, learning with video media fosters student interest and motivation to always pay attention to lessons.

Advantages of Video Media [17] there are several advantages of using video media, including: (1) Video can add a new dimension to learning, video presents moving images to students in addition to the accompanying sound. (2) Video can show a phenomenon that is difficult to see in real.

A media video has advantages, among others: 1. By using video (with sound or not), we can re-show certain movements. Video editing creativity is a key factor in the success of making interactive videos, using certain effects to strengthen both the learning process and the entertainment value of the presentation. With video, information can be presented simultaneously at the same time in different locations (classes) and with an unlimited number of viewers or participants with a place and time because students can determine when and where they will learn, with videos students can learn simultaneously independent.

4. CONCLUSION

Research on *brain jogging* exercises to improve motivational abilities provides positive things for students, especially in the midst of ongoing distance learning. In detail, the conclusions of this study are explained as follows. There was an increase in students' memory ability scores before being given *brain jogging exercises* and after being given brain jogging exercises. So it can be concluded that there is a significant effect of *brain jogging* exercise on the learning motivation of SMK Kab. Kulonprogo, Special Region of Yogyakarta.

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