

Computer Based Exercise Program Design

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Abstract: The complete figure of sports coach' competene consists of academic and professional ability as a whole. The academic competence is defined as the scientific basis of the training implementation tips which is the foundation for the development of professional competence. The outcome of this study is the improvement of professional trainers, therefore training for sport coaches is required continuously based on the plan making of training program. The target that is expected to be achieved in this year's research is to obtain a computer-based exercise program plan. In details, the specific objectives of this study are: (1) describing the beginner, medium and achievement training programs; (2) analyzing the need for a computer-based exercise program plan in training activities; (3) finding out the characteristics of the design of training programs in sports training activities; (4) creating a computer-based exercise program design application in sports training activities. The research method consisted of the details of design type, subject, variable, instrument, and data analysis by employing descriptive research type conducted by survey and development method. Research subjects in survey research consisted of sports trainers in Malang especially for needs analysis, while for small group trial was in Malang and Surabaya and for field test was in Malang, Surabaya, Jember, and Kediri. Research instrument was based on research variables. Benefits which are expected to achieve, are based on the research findings which will be presented and discussed in this study such as: empirical data of trainer cognition, trainer characteristics and program application to design training programs that are indispensable for conducting training related to professional trainers based on computer based exercise application program.

Keywords: application, design, exercise program

I. INTRODUCTION

Sports are defined as all aspects of exercise that requires regulation, education, training, coaching, development and oversight (Law No. 3 of 2015). The scope of the sports system consists of sports education, recreational sports, and sports achievements. Sports achievement is a sport that fosters and develops sportsmanship in a planned, tiered, and sustainable efforts through the competition to gain achievement with the support of science and technology.

Many factors influence the improvement of national sport achievement, one of them is training system and methodology which is equipped with various research result from various fields of science such as science, physiology, biomechanics, physical exercise, nutrition, psychology, test and measurement,

sociology and theory exercise, motor learning, statistics, health and history [7]. Various areas of support to improve the quality of systems and training methods, have been conducted with the hope of being able to provide a beneficial contribution theoretically to the quality of systems and training methods.

In line with the development of the era, the nation of Indonesia is required to be able to follow and anticipate sports development program by utilizing the progress of science and technology especially in sports related scheme. Competition achievement in sports is increasingly stringent which demands physical quality, knowledge and technology of Indonesian man who can compete in international sporting event.

Information technology has been rapidly developing along with increasingly sophisticated computer functions in assisting human problem solving including sports related problems. All the sporting individuals, especially trainers directly related to the achievement of athletes, expect to master information system based on science and technology that is able to quickly and accurately solve problems. One of the accurate factors for providing information is the computerized system. With a system that can support and facilitate the performance of trainers, especially in making a proper and accurate training program in accordance with systematic and methodical scientific principles, it is expected that the creation of sports training achievement can be more modern and valid.

Sports development achievement utilizing science and technology research on the pattern of sports performance improvement is often blamed for not maximal coaching athletes that impact on the level of achievement especially national athletes at the International level. Therefore, the application of science and technology in conducting coaching athletes is of crucial matter to be taken seriously. For that matter, it is necessary to be a step further by utilizing science and technology in the field of sports, to encourage sport achievement in Indonesia. One of the science and technology factors in achieving high sports accomplishment is utilization in planning the proper training program.

The training program developed by the trainer greatly influences the achievement of the athlete's performance, therefore good training programs should be carefully, systematically and gradually planned [10] with reference to methodical and scientific procedures [7] in order to develop bio motor skills, tactical skills, health care, theoretical knowledge, injury prevention and mental aspects. Most trainers, especially trainers in various areas [2] have not been maximized in the

preparation of training programs on the coaching exercise. Preparation of the training program is still working a lot in manual guide without heeding the various science background, especially in the application of science and technology in the preparation of training programs. There are many trainers who do not show their training programs to other trainers or their athletes, this raises some of the questions whether the trainer is making an exercise program or indeed his training program does not meet the expected standards to improve his athlete performance. A coach must educate the various disciplines that support his performance as a trainer, especially in the creation of training programs.

By using a multidisciplinary approach, researchers will conduct research by collaborating the disciplines of sports, especially the design of training programs with information systems technology that is artificial intelligence / artificial intelligence (AI) based system. Collaboration of these two disciplines is intended to optimize research that is increasingly modern and sophisticated. Information systems based on artificial intelligence (computer) has the opportunity to run human logic that is applied in a programming system so that the created program will run in accordance with what has been conceptualized. With these advantages, it is expected that most of the logic / concepts are able to be applied in the computer. The exercise program is a complicated logic and time consuming. Thus, the coach needs to thoroughly understand in order to become a professional coach. However, trainers as ordinary people certainly have a variety of deficiencies both in physic and cognition. As time passes, it will decrease, so if someone is faced with so many tasks in a long time, then fatigue will come and cause a decrease in concentration. The decrease in concentration will affect the performance so that the task is not resolved or the training program is not maximized as many books should be used as a design guide and should be read in order to follow the rules.

In order to achieve the qualified training programs (better, systematic, methodical, and scientific) for the performance of national trainers and educators in sports, it is necessary to take a further step by utilizing technology and information that is artificial intelligence based information system or also called as computer-based program in designing the creation of sports exercise program. To improve the professional trainers in training their athletes, a computer-based exercise program or Artificial Intelligence (AI) program is essentially required.

The target of this research is a model of computer-based exercise program or Artificial Intelligence (AI) for sports coaches in East Java to improve local and national sports achievements. The development of dynamics of the live of increasingly global society today is characterized by the progress of science caused reactualization in the way of looking at the knowledge of someone who wrestle in the field of training, especially sports coaching. The main ingredients for a nation to grow through the flow of globalization is knowledge. The quality of education and training can be developed in accordance with the global development if all people have knowledge by following the development of science and technology.

A very important role for the education and training process to participate in providing direction in the development of education is Technology. Information technology is part of the media used to convey the message of science, from printed media to telecommunication media and Internet media (E-Learning). With the development of technology, it is wished that all levels of society must master technology to compete in this global era, especially to welcome MEA (Economic Community of Asia). The success of the public in sports can be measured through the sports index of the SDI (Sport Development Index) which consists dimensions of (1) participation, (2) open space, (3) physical fitness and (4) human resources (Ditjora, 2004). The Field of Human Resources must be prepared from the beginning, especially the trainers who have a very important role besides the athletes. Our country of sport is especially centered in Asia. Thus, to lift the sports rank we need to work together in all fields; one of them is an expectation for the trainers to have the skills to create an exercise program with artificial intelligence (computer). According to Thompson (1993: 61) "practice is a systematic process to improve the fitness of athletes according to the chosen sport". Thus, a systematic exercise of activity is carried out repeatedly with progressively increased loads over long periods to improve the performance of athletes in certain sports.

In order to properly run the exercise, great attention should be devoted in designing the exercise program that fits the principles of practice.

II. METHOD

The research design used in this research is the design of research development from descriptive research design and procedural development (Malang State University, 2017). The whole research of making the Artificial Intelligent (AI) Program Application (SOPPLAI) is implemented in the first year.

Descriptive study to analyze field conditions and to make product prototype is applied in the form of script script Application Design of Artificial Intelligence (SOPPLAI), and Artificial Intelligence Program Design Process. The main product that will be produced in this research is Application Design Program of Artificial Intelligence (SOPPLAI). To produce the main product, the preliminary research is descriptive field study related to field condition which consists of coach performance analysis, training facility and infrastructure analysis, and requirement analysis of the need for application development of Artificial Intelligence (AI) Program Design (SOPPLAI). After the descriptive research is completed then the next step is the making of the script Application of Artificial Intelligence Program Design (SOPPLAI). Based on the results of the script preparation of Artificial Intelligent (AI) Program Design (SOPPLAI) then the next step is to implement the application of Artificial Intelligent (AI) (SOPPLAI) as the main product. The purpose of development in this research is to make script scenario for Application Design of Artificial Intelligence Program (SOPPLAI). To achieve that goal, descriptive research is used with survey method as research design and focus group discussion. The survey method aims to collect coach performance analysis data, analysis of training

facilities and infrastructure, and needs analysis of the need for application development. Based on data analysis, results will reveal the prototype and product specifications of performance analysis of trainers, analysis of training facilities and infrastructure, as well as needs analysis of application development.

The development plan is used to develop the product, which is the performance analysis of the trainer, the analysis of training facilities and infrastructure, as well as the needs analysis for the development of the Artificial Intelligent (AI) Training Program Application (SOPPLAI). The product development model used is a procedural development model. The procedural development model is a descriptive model. To produce a product in the form of Artificial Intelligent (AI) Program Application (SOPPLAI), some steps must be carefully fulfilled. (Malang State University: 2000). The description of the concepts, variables, indicators and research instruments as well as the scope of the study, is as follows:

Development stages is the steps undertaken in the research and development activities consist of preparation of development activities, product development, product trials, product revisions, and revised product reviews. development activity preparation is done before implementation, tool preparation, implementers and visuals that will be used in this development program. Each program created, requires two main components of hardware and applications. While the minimum Operating System that can run Application Design Program of Artificial Intelligence (AI) (SOPPLAI) is Windows 7 Basic.

Product development: the first activity of product development is to conduct discussion (focus group discussion) about system design by using application or computer program Visual Basic 6.0 with Microsoft Access database and Adobe Photoshop CS3 design. The next step is implementation by designing and making Artificial Intelligent (AI) Program Application (SOPPLAI). The system design is described as follows:

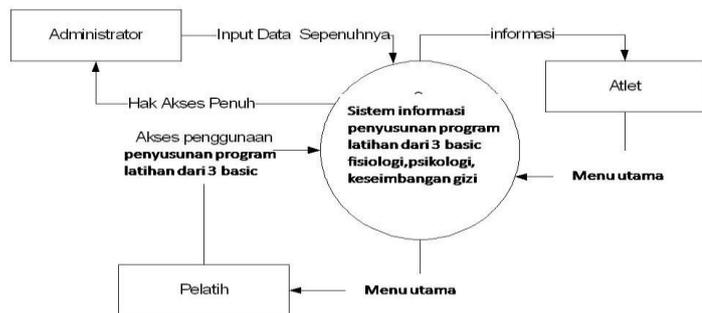


Figure 1 Context Diagram

In developing the products, then given inputs in the form of answers to questions is compiled in inventory. The subjects of field trials are trainers and lecturers of sports training as product users of Artificial Intelligent (AI) Program Application (AI) (SOPPLAI).

1. Product revision of Artificial Intelligent (AI) Program Application (SOPPLAI) is based on the results of further tests.
2. The subject of the research used as the respondent in the requirement analysis activities on the Artificial Intelligent (AI) Program Application (SOPPLAI) is the trainer, in this research is the coach sports club in Malang East Java. The subject of the coach's research as the respondent is the trainer who is still actively training in certain sports clubs in Malang City East Java. The number of respondents is 30 trainers determined by purposive sampling. Criteria of respondents are trainers who still actively train. Experts who are the subject of this research are academics in the field of sports coaching and information technology experts from UNESA Surabaya, UNY Yogyakarta and UM Malang. As for field trials, there are trainers and sports students from several cities in East Java, which are Malang, Surabaya, Kediri, Jember and Sidoarjo.
3. The instruments which are used for collecting coach performance analysis data, needs analysis, and media analysis of clubs to practice are as follows:
 - a. Inventory to collect data on performance analysis of trainers, needs analysis Artificial Intelligence Program Design (ARP) and media analysis of clubs to practice. Prior to inventory instruments used to collect research data, first tested the validity of the contents.
 - b. Focus Group Discussion is conducted to design scenarios. Artificial Intelligent (AI) (SOPPLAI) is based on the needs analysis of the research subjects of trainers and lecturers.
4. The research instrument used for data collection in the implementation of research and development of Artificial Intelligent (AI) Program Design (SOPPLAI) format consists of rating formats by using rating scores and essays.
5. Experts observe the Artificial Intelligence (AI) Program Design (SOPPLAI) Application, followed by an assessment using the value scale. Expert review data which are divided into three, which are sports expert review, information technology expert, and learning instructor of sport coaching methodology. The results of the study of sports coaches in the form of value about the quality of the contents of Application Design Program of Artificial Intelligence (AI) (SOPPLAI) theoretically. The results of the review and consulting of information technology experts are the values of the quality of scenarios, systems and design of Applications of Artificial Intelligence (AI) (SOPPLAI) is based on Software Working Principles and Design Applications of Artificial Intelligence (AI) (SOPPLAI). The results of studies and consultation of sport coaching experts is described in the form of quality content value related to learning. The results of this expert review and consultation are used as a basis for revising the developed product from observation and rating formats using rating, scale and inventory.
6. Inventory is used to collect field trial data. The inventory contains the questions and suggestions provided to the field trial subjects. The contents of these questions are related to the materials and the design of Artificial Intelligent (AI)

Application Program Design (SOPPLAI). The subject of field trials is the sports club coaches in Malang.

7. The steps taken in descriptive research with survey method are as follows.

III. RESULTS & DISCUSSION

The results of the needs analysis from the 18 trainers in East Java showed that 55% were fond of being a trainer, 72.2% always created an exercise program, 50% of trainers made training programs 2 times in 1 year, 56% had not set up training program, 52% had not controlled the implementation of program, 61% of trainers always paid attention to the components in the drafting exercise program, 55% of trainers knew the needs of the components of the preparation of training programs, 55% were definitely needed to know the components of the preparation of exercise program, 66.7% the trainers rarely organized the training program systematically and methodically, 66.7 the trainers felt it was necessary to organize the training program systematically and methodically, 94.1% of the trainers knew that the preparation of a systematic and methodical training program had an important role in achieving maximum athlete achievement, 61.1% of trainers were able to make the training program methodically and systematically, 83.3% of the trainers felt that the training program was in line with the athlete's needs, 72.2% of the trainers in the training program used Ms Excell, 50% 50% of trainers felt little help in the preparation of training programs, 61.1% of trainers costed less for training programming services, 72.2% trainers were eager to create their own training program, 83.3% of trainers never knew the application in the preparation of an exercise program, 94.4% of trainers never used a special application for training programming, 70% 6% of trainers were eager to use special applications for the preparation of training programs, 77.8% of the trainers stated that it was necessary to develop a special application for the preparation of an easier Indonesian language training program.

The results of the field test in east java, small group 85,88% and large group 86,68%. Field trials are the stages for product development test of research subjects; the purpose is to know the application of the developed product and to obtain the research subject's response to the developed product

IV. CONCLUSION

From the results of the needs analysis, it can be concluded that the trainers really want a special application to plan and develop sports training programs in order to improve sports achievements at regional, national and international levels. Such applications can facilitate the trainers to develop a well-measured exercise program, game or artial arts by using Indonesian language.

REFERENCES

- [1] Ambarukmi, D. H., dkk. 2007. *Physical Coach Level 1*. Jakarta: Deputy Assistant of Development of Sportsmanship and Sports Development Deputy of Achievement Improvement and Science and Sport Science of Ministry of Youth and Sport.
- [2] Bompa, T. O. & Haff, G. G. 2009. *Periodization: Theory And Methodology Of Training*. Fifth Edition. Translated by: Ramdan Pelana, dkk.
- [3] Budiwanto, S. 2012. *Sports Coaching Methodology*. Malang: State University of Malang.
- [4] Budiwanto, S. 2014. *Research Methodology: Its Application In Sport*. Malang: State University of Malang.
- [5] Collin, DR. dan Hodges, PB. 1978. *A Comprehensive Guide to Sport Skills Test and Measurement*. Unites State of Amerika: Bannerstone House.
- [6] Fahri. 2014. *Development of Dribbling Basic Technique Training Model (Dribble) in Bolabasket Games Using Drill Level through Video of Extracurricular Participants of SMP Negeri 17 Malang*. Malang: State University of Malang.
- [7] Harsono. 1988. *Coaching and Psychological Aspects in Sport*. Jakarta: CV. Tambak Kusuma
- [8] Sukadiyanto & Muluk, D. 2011. *Introduction to Theory and Methodology of Physical Training*. Bandung: Lubuk Agung.
- [9] Wissel, H. 2000. *Basketball: Steps To Success*. Jakarta: Grafindo Persada.
- [10] Yudiana, Y. dkk. 2008. *The Basics of Sports Coaching*. First Edition. Jakarta: UniversitasTerbuka Lynch, Brian K. 1996. *Language Program Evaluation*. Cambridge: Cambridge University Press.