

## Multimedia Development Based on Android in The Prevention and Handling of Injuries to Sports Players

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### Abstract

The purpose of this study are: to develop Android-based multimedia in prevention, to manage injuries to athletes, to knows the development results developed as a medium of knowledge and information on injuries by using the method (1) initial analysis, (2) prevention needs analysis and injury management, (3) analysis of making counts, (4) planning the initial product, (5) expert validation, (6) revisions, (7) small scale tests, (8) revisions, (9) product testing, (10) revisions. The results of the validation of material experts I and II which covered all aspects obtained a percentage value of 83% and 90%, while the validation of programmer I and II experts obtained a percentage value of 93% and 86% with very good categories. The results of small-scale trials obtained a percentage value with trainers and futsal extracurricular students as much as 84% while the results of large-scale product trials obtained a percentage value of 89% with very good categories. Conclusions and suggestions in this study produce PPC futsal multimedia products based on android applications in the prevention and handling of injuries. The suggestion that PPC futsal multimedia can be used as a science and information related to futsal sports injuries that can be used by coaches and extracurricular students.

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## INTRODUCTION

Sport is a movement activity that is used to improve human quality so that people can be physically and mentally healthy. Sports activities become part of the basic needs in daily life in improving the fitness needed in carrying out their duties, as stated in (Law of the Republic of Indonesia Number 3 of 2005 concerning the National Sports System Article 1 Paragraph 5).

Sport is a necessity in its activities for human life individually and in groups, which aims to nourish the body, and spiritually. Although exercise is healthy, exercise is also at risk for injury in its activities, which is difficult to predict (Mutohir, and Maksum, 2007).

Speaking of many types of sports injuries and can be grouped based on place, process, and time of injury (Lutan, 2001). In general, the types of injuries that may occur are a bruising injury, ligament injury, injury to muscles and tendons, bleeding to the skin, and fainting. In harmony with Setiawan (2011) as for the causes of sports injuries usually due to trauma/direct impact or repetitive exercise for a long time.

The sport meant by the researchers was futsal extracurricular training conducted in schools and outside schools, as well as to develop students' talents and interests to enrich and expand themselves in sports achievements (Law of the Republic of Indonesia Number 39 of 2008 concerning Student Development). Injuries can occur during sports both during learning, practice and competition, substantial daily activities, and these events are difficult to avoid (Sukarmin, 2006).

Injuries to futsal extracurricular sports activities can be grouped as follows level 1 (minor injury), namely blisters, bruises, and sprains. Level 2 injury (moderate injury), namely pain, swelling, disturbances in muscle function, and muscle strains, tendons, ligament tears 3. Level 3 injury (severe injury), namely fracture head injury where an acute injury is an injury that must be handled intensively by experts using medical assistance.

From the results of the observations and experience of the researchers as for the problems

that are currently occurring and unresolved, as follows: (1) Lack of understanding of trainers and extracurricular students regarding the futsal sport, (2) Insufficient knowledge and understanding leads to discomfort in the management of injuries when an injury occurs which results in a lack of proper handling of injury, (3) In the field of futsal extracurricular trainers (trainers), not all trainers understand the types of handling injuries, and proper care, so that athletes,(students) can continue to achieve continuity in their careers, (4) Not only that the injured sufferer still believes in the *dukun urut*, rather than the physiotherapist, and the massage expert in handling the injury appropriately, (5) Lack of information and direction in the management of injuries appropriately in futsal sports.

The recovery of injuries depends on the first aid decision given (Setiawan, Sulaiman, and Rustiana, 2014). In line with Arif Setiawan (2015) knowledge of sports injuries and massages, is very important for those who are engaged in sports, health, and for those who are involved in the field of social work, such as club coaches, teachers, and others to master knowledge about massage, both theoretical knowledge and mastery of practical skills.

In the journal Meikahani, and Kriswanto (2015) entitled "Development of pocketbooks for the introduction of relief and the treatment of sports injuries for junior high school students." This research is in the form of a booklet containing knowledge, help, and minor injury care for students of Public Junior High School 4 Depok, there are weaknesses in this book which are presented directly by the author, one of which is still handbook, procurement of pocketbooks is still expensive, media books are not fast in delivering information.

Media functions in attracting students' attention and helping to accelerate understanding in the information process (Fathurrohman, and Sutikno, 2007). The presence of media has an essential meaning in the process of information; among others, the media can be an intermediary in helping students understand obscurity and complexity of material (Sulistiyani, Jam, and

Rahardjo, 2013). Also, Arsyad (2011) media also functions in motivating students and providing students with similar experiences about events in their environment. Judging from the type, the media is divided into visual media, audio media, and audiovisual media.

Visual media is media that only relies on the sense of sight. This visual media displays images, photos, and prints. Audio media is media that only relies on sound capabilities such as radio, cassette recorders, and LPs, while audiovisual media is a medium that has sound elements, and image elements. This type of media has a better ability because it covers both the first and second type of media (Fathurrohman, and Sutikno, 2007).

Whereas according to Hofstetter (2001) multimedia is the use of computers to display information that is a combination of text, graphics, audio, and video so that users can navigate, interact, create, and communicate with computers.

Following the background of the existing problems, and pay attention to some previous studies or findings related to research on the development of prevention, and managing sports injuries, then further formulated the concept of multimedia product development model PPC futsal application based on Android is an application concept that can be one solution to inform the importance of understanding first aid injuries both in practice and theory, when injury occurs.

The existence of this study is expected to be useful for students and extracurricular trainers, as well as all futsal sportsmen in adding information, and insight into injuries to futsal sports and facilitating trainers, and students in the instructions to overcome injuries when the injury occurs.

## METHODS

The procedure of development research carried out includes several activities, including initial analysis, handling needs analysis, and prevention of injury, analysis of making counts, planning the initial product, expert validation,

revision, small-scale trials, revision, product trial, revision (Borg, and Gall, 2003).

The trial subjects were selected using a purposive random sampling technique. The research subjects include (1) four expert experts as validators, namely: two sports injury experts and two programmers, (2) two trainers and ten students (small scale test), (3) four trainers and twenty students (product trials/large scale). The type of data used in this study is a quantitative and qualitative data. Quantitative data is obtained from the results of expert validation assessments, and the outcomes of the questionnaire/questionnaire filling scores by respondents (users).

The assessment category consists of 5 assessment criteria, namely: very poor/very less precise/very less clear (value 1), not good/less precise/less clear (value 2), quite good/quite precise/quite clear (value 3), good/right/clear (value 4), and very good/right/clear (value 5). While qualitative data is obtained from the results of interviews, as well as some input, and criticism given by expert sources or other research subjects. The data analysis technique used is percentage by dividing the acquisition score divided by the total score at times 100%.

## RESULTS AND DISCUSSION

Following the results of existing research, data obtained from the steps of the research development procedures used by researchers. The results of the development are PPC futsal based on Android applications in the form of an Application Package that can be downloaded in play store, so that users can easily access using mobile phones to add information and knowledge about injuries, especially futsal injuries.

This application itself is made easy with images, descriptions, and videos in it. The menu in the application is an explanation of sports injuries, prevention of injuries, principles of handling injuries, handling injuries, and equipped with location injury experts especially in Kubu Raya District, Pontianak to facilitate users to communicate further.

The results of the validation of material experts I and material II obtained the value of percentage I which included aspects of display quality of 86% and 94%, and which included elements of the content received by the percentage of material experts I 81% and material experts II 87%, while for all aspects obtained the value of the percentage of material experts I 83% and material experts II 90%. In the category results from the assessment of material experts who cover aspects of the quality of the display, and the content of the material and the overall elements get a very good category.

Validation of programmer experts on PPC futsal products obtained a percentage value for 91% of the display aspects of programmer I and 88% of programmer II experts. In the programming aspect, the percentage of 95% of programmer I and 84% of programmer II experts was obtained. The overall results of the percentage aspects obtained were 93% of programmer I experts and 86% of programmer II experts. In the category results from the assessment of engineers who cover aspects of the content, and the usefulness and overall aspects of getting a very good category.

In a small scale test conducted at the Public Senior High School O1 Rasau Jaya, and Vocational High School Panca Bhakti with 12 respondents consisting of 10 students, and two extracurricular trainers the results of the assessment on the aspects of the display, material content, and uses and overall aspects get a very good category. The following in table 1 describes the results obtained from a small scale test.

**Table 1.** Small Scale Test Results

Information	Percentage (%)	Category
<u>Trainers and students</u>		
Display aspect	85	Very good
Content aspect	85	Very good
Useful aspects	83	Very good
Total (N)		12
<u>Trainers and students</u>		
All aspects	84	Very good
Total (N)		12

Whereas the large-scale product trials were carried out at Public Senior High School 01 Sungai Raya, Public Senior High School 02 Sungai Raya, and Senior High School Taman

Mulia with a total of 24 respondents consisting of 4 trainers, and 20 extracurricular students. The results of the assessment on the aspects of the display, the content of the material, and aspects of performance and the overall aspects of testing large-scale products get a very good category. For more details, the following table 2 describes the results obtained from large-scale product trials.

**Table 2.** Large Scale Test Results

Information	Percentage (%)	Category
<u>Trainers and students</u>		
Display aspect	88	Very good
Content aspect	89	Very good
Useful aspects	91	Very good
Total (N)		24
<u>Trainers and students</u>		
All aspects	89	Very good
Total (N)		24

The development of Android-based PPC futsal multimedia products in the prevention and handling of injuries for trainers and extracurricular students of Senior High School in Kubu Raya Regency, of course, begins with reviewing existing problems regarding the lack of knowledge, and information regarding prevention, and handling injuries appropriately, and correctly in accordance with procedures for treating wounds.

Therefore an alternative solution to a better problem is the need for modification or development of multimedia in conveying information about injuries. The multimedia modification that is developed certainly must pay attention to or adapt to the characteristics of students, and trainers, so that changes made can help students, and trainers in prevention, and handling injuries.

The presence of media has an essential meaning in the process of information, among others, the media can be an intermediary in helping students understand obscurity, and material complexity (Sulistiyani, Jam, and Rahardjo, 2013). Also, the media functions in motivating students and provides students with similar experiences about events in their environment (Arsyad, 2011).

In the initial planning, the cost of making this PPC futsal product amounted to three million rupiah, after the stages of research, and revision

of the product through relevant experts, and small-scale tests and large-scale product trials. Then obtained a calculation of the cost of making a product of five million six hundred thousand rupiah, due to several inputs, and improvements to produce an ideal, effective, and efficient product.

Injury is not something that happens, but there is a cause. Sports injuries are caused by various factors, including mistakes in training methods, structural abnormalities, and physiological weaknesses of the function of supporting tissues and muscles (Bahr, 2003). In this case, the relevant research is among others (1) Adobe flash player based media development prevention, help, and sports injury care for junior high school physical education teachers (Irawan, 2014), (2) Sumartiningsih (2012) sprained ankle injury (ankle sprains), (3) Dharmadi (2015) this study entitled "Sports safety through a safety manual.

The purpose of the researchers pay attention from several previous studies or findings related to PPC futsal multimedia development research is to explore information from previous research as a comparison material both about the shortcomings of existing advantages. In this multimedia development research on Android-based PPC futsal applications, this is an application concept that can be one of the solutions to inform the importance of understanding first aid both in practice and in theory when the injury occurs.

## CONCLUSION

Based on the results of research on the development of Android-based multimedia in the prevention, and handling of injuries in sportspeople in Kubu Raya District. It can be concluded: (1) Produce Android-based PPC futsal application multimedia products for extracurricular trainers and students, (2) Results of multimedia product development for Android-based PPC futsal applications on assessment for material experts and programmers who cover the appearance, content of the material, and the overall aspects of getting a very good category. In

small-scale trials and large-scale product tests, an assessment was obtained from respondents consisting of coaches and students who covered aspects of appearance, content and usability, and overall aspects of getting a very good category.

## REFERENCES

- Arsyad, A. (2013). *Media pembelajaran*. Jakarta: Penerbit Raja Grafindo.
- Bahr, R, & Holme, I. (2003). Risk factors for sports injuries — a methodological approach. *British Journal of Sports Medicine*, 37(5), 384-392. Retrieved from <https://bjsm.bmj.com/content/37/5/384.long>
- Borg, & Gall. (2003). *Education research*. New York: Allyn and Bacon.
- Dharmadi, M. A. (2015). Keselamatan olahraga melalui buku pedoman keselamatan dalam olahraga. *Jurnal Ilmu Sosial dan Humaniora*, 4(2). Retrieved from <https://ejournal.undiksha.ac.id/index.php/JISH/article/view/6383>
- Fathurrohman, P. & Sutikno, S. (2007). *Strategi belajar mengajar: strategi mewujudkan pembelajaran bermakna melalui penanaman konsep umum dan konsep islami*. Bandung: PT Refika Aditama.
- Irawan, D. (2017). Pengembangan media berbasis adobe flash player pencegahan, pertolongan, dan perawatan cedera olahraga bagi guru pendidikan jasmani sekolah menengah pertama (smp). *Jurnal Pendidikan Jasmani dan Olahraga*, 2(2). Retrieved from <http://ejournal.upi.edu/index.php/penjas/article/view/09-02-01>
- Law of the Republic of Indonesia Number 3 of 2005. *Sistem keolahragaan nasional*. Jakarta: Kementerian Negara Pemuda dan Olahraga Republik Indonesia.
- Lutan. (2001). *Olahraga dan etika fair play*. Depdiknas: Dirjen Pemberdayaan Ilmu Pengetahuan dan Teknologi Olahraga.
- Meikahani, R., & Kriswanto, E. S. (2015). Pengembangan buku saku pengenalan pertolongan dan perawatan cedera olahraga untuk siswa sekolah menengah pertama. *Jurnal Pendidikan Jasmani Indonesia*, 11(1). Retrieved from <https://journal.uny.ac.id/index.php/jpji/article/view/8166>
- Mutohir, T. C., & Maksum, A. (2007). *Sport development index: alternatif baru mengukur kemajuan*

- pembangunan bidang keolahragaan (konsep, metodologi dan aplikasi)*. Jakarta: PT Indeks.
- Hofstetter, Fred T. 2001. *Multimedia Literacy. Third Edition*. McGraw-Hill International Edition, New York
- Setiawan, A. (2011). Faktor timbulnya cedera olahraga. *Media Ilmu Keolahragaan Indonesia*, 1(1). Retrieved from <https://journal.unnes.ac.id/nju/index.php/miki/article/view/1142>
- Setiawan, B., Sulaiman, & Rustiana, E. R. (2014). Pengembangan self massage dan terapi latihan pada cedera ankle (pergelangan kaki). *Journal of Physical Education and Sports*, 3(1). Retrieved from <https://journal.unnes.ac.id/sju/index.php/jpes/article/view/4784>
- Sukarmin, Y. (2006). Petunjuk praktis pencegahan kecelakaan dalam proses pembelajaran pendidikan jasmani di sekolah menengah pertama dan atas. *Jurnal Pendidikan Jasmani Indonesia*, 5(1). Retrieved from <https://journal.uny.ac.id/index.php/jpji/article/view/6222>
- Sulistiyani, N. H. D., Jam, J., & Rahardjo, D. T. (2013). Perbedaan hasil belajar siswa antara menggunakan media pocket book dan tanpa pocket book pada materi kinematika gerak melingkar kelas x. *Jurnal Pendidikan Fisika*, 1(1). Retrieved from <http://jurnal.fkip.uns.ac.id/index.php/pfisika/article/view/1784>
- Sumartiningsih, S. (2012). Cedera keseleo pada pergelangan kaki (ankle sprains). *Media Ilmu Keolahragaan Indonesia*, 2(1). Retrieved from <https://journal.unnes.ac.id/nju/index.php/miki/article/view/2556>