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Designing instructional multimedia system for scout activities

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Abstract. The name for members of organizations engaged in education scouting in Indonesia is Pramuka. This research is aimed at designing an instructional multimedia system for scout activities as an effort to support character development of young generation. To this end, this research used a multimedia system development method that consisted of the following stages: Concept, Design, Material Collecting, Assembly, Testing, and Distribution. The system testing was conducted using black box on all instructional systems. The result revealed that the built functions were in accordance with the design and could run on Android-based smartphones. This research came into a conclusion that the instructional system for scout in question could work effectively and efficiently on mobile devices.

1. Introduction
Pramuka refers to a member of Gerakan Pramuka Indonesia (Indonesian Scout Movement), a scouting organization in Indonesia. Scout teaches soft skills and hard skills outside the school and family environments using fun and attractive methods to students at 7-25 age range [1]. The main aim of scout is to develop good characters. Scout should be better introduced. One of alternatives to improve the effectiveness of scout instruction is through the use of instructional multimedia system To help achieve the aforesaid aim, multimedia-based devices can be used [2]. This study aims to design a learning media application for scouting. As is known, in building applications used software engineering methods. Some research shows software engineering is used for various applications, including information systems, expert systems, decision support systems, and multimedia applications.[3]-[5]

The scout instructional multimedia system is designed for mobile devices, so the chosen building system is Android-based devices. This paper describes the design of instructional multimedia system for scout activities to be run on mobile devices.

2. Methodology
This study used a multimedia design method that consisted of the following stages: concept, design, material collecting, assembly, testing, and distribution [3]. The concept stage determined for what and for whom the system was developed. The design stage was where the storyboard and navigation structure was designed. The material collecting stage was where instructional materials collecting took place. The materials were in the form of texts, pictures, and sounds. The assembly stage was where all materials were combined into instructional media system for scout. To make sure that the design was in accordance with the design, functional testing was carried out using black box method by the application developer and users. The last stage was distribution where the system was stored into storage media in
order to be easily distributed. On Android, the system can be stored in online store like Playstore. The building method of this scout instructional media is displayed using work breakdown structure in figure 1.

![Work breakdown structure of multimedia system for scout.](image)

3. Result and discussion

Technological devices are made to improve the quality of life [6]. One of technological devices that can be used in education is multimedia. This paper describes the design of instructional multimedia system for scout activities. This multimedia system displays and combine texts, sounds, pictures, animation, audio, and videos, implemented using a tool and link to enable users to navigate, interact, work, and communicate [7]. In education, multimedia can be used as instructional media or personal learning media [8]. The use of multimedia for instructions has been proven to create fun learning environments [9], improve learning motivation [10], enhance learning effectiveness [11], enhance understanding [12], promote student-centered instruction, become an efficient investment of learning aid [13].

The development method consists of several stages. The concept stage determines who will be the user and analyzed what is needed to develop the system. The purpose of system development is to provide instructional multimedia that can be run on Android-based smartphones to teach scout-related skills, especially knot system. The resulting application is designed for elementary school students at 7-9 age range and all scout-related parties.

The application is developed to promote elementary school students’ enthusiasm in participating in scout activities. Based on user’s need analysis, the instructional system should be interactive and contains scout skill tutorials. The application should not consume large amount of memory in order to be run on Android smartphones. The goal is to provide:

a. Interactive instructional system that can be used anywhere and anytime.
b. An instructional system that combines texts, pictures, and audio to facilitate the learning.
c. A system that can make use of Android for the young generation character development.

Therefore, hardware and software sufficient to process texts, pictures, and audio are required. The software used was text, picture, and audio processor and combiner. The design stage includes the navigation structure and storyboard designing. The navigation structure used a hieratical model between scenes and the built system. Figure 2 illustrates the navigation structure. The navigation
structure is featured with scene shift navigation, from start to the last material. Figure 2 shows the hierarchical model. Scene 1 is the opening display that can navigate to Scene 2 that displays the main menu.

![Diagram](image)

Figure 2. Navigation structure of scout instructional multimedia system.

From the main menu, the user can go to Scene 3 (introduction to scout), Scene 4 (instructional materials), Scene 5 (about page), or Scene 6 (exit). The instructional materials are displayed in different scenes to make it possible for the students to choose which they want to learn. Every scene requires a storyboard in order for the texts, pictures, and sounds to run synchronously.

The material collecting stage included picture data, audio data, and text data collection. These data were then edited to meet the system design. The edited files could then be combined in the assembly process to develop the instructional multimedia system. The picture files collected were in *.jpg or *.png format so that they would not consume large amount of memory. These pictures are downloaded from the Internet, processed and combined with texts, and saved in the *.jpg format. The picture addition process is as follows: (1) selecting relevant pictures, (2) inserting and editing pictures to meet the system design, and (3) saving edited picture files.

Sound data were collected in *.mp3 format from recording processes or from existing data in various sources. These sound files are used as the background sound when scenes display. The sound data were processed using sound processing software. The sound addition process is as follows: (1) selecting relevant sounds, (2) inserting and editing sounds to meet the system design, and (3) saving edited sound files. The sound files can be taken by cutting sound files from a collected sound files from various sources. The file cutting can be done using sound cutting software, and then the cut files are processed using Android Eclipse Juno.
The application should be error-free before distribution. Therefore, the application was tested by the developer using black box testing method to locate and eliminate errors. The black box test results revealed that the instructional multimedia could run in accordance with the desired design. The testing was conducted on its functions by taking account of the navigation structure. The result showed that the system could run perfectly [3] [14].

The distribution stage is where the product is marketed. It was done by packaging the system in the *.apk format so that it can be stored in Android-based online store like Playstore [15]. The system can be distributed for free by saving it on the scout or school’s websites [16]. Children are fond of this instructional multimedia because it is featured with children songs. Knot system material contained in the system are frequently learned by scouts to improve their skills [17]. The system is effectively used to improve scout skills because the materials are children friendly and featured with many pictures. [18] Some of scout instructional displays on Android smartphone are shown in figure 3.

4. Conclusion

The instructional multimedia system can be prepared for mobile system so that it can be used scout/scouts all over the world since the proliferation of mobile device-based social media. The development of scout instructional multimedia could contribute positively to the reduction of negative Internet content. Therefore, it is expected that there will be more instructional multimedia systems developed for mobile devices. The design of mobile device-based systems such as Android should continue to be developed to increase public access to other educational materials.

References

[1] S A Damanik 2014 Pramuka Ekstrakurikuler Wajib di Sekolah *Jurnal Ilmu Keolahragaan* **13**(2) pp. 16-21

[2] A C Luther 1994 *Authoring Interactive Multimedia (The IBM Tools Series)* (New York: AP Professional)

[3] D D S Fatimah, D Tresnawati and C S Ma'rup 2017 Perancangan Game Puzzle Untuk Pembelajaran Menggunakan Metodologi Multimedia *Jurnal Algoritma* **14**(2).

[4] I Purvanto, D D S Fatimah and Partono 2012 Perancangan Sistem Informasi Transaksi Tabungan Bank Sampah Garut *Jurnal Algoritma* **9**
[5] D A Firman and D D S Fatimah 2016 Pengembangan Sistem Pakar Diagnosis Penyakit Kelinci Berbasis Visual Prolog Jurnal Algoritma 13(1) pp. 177-183

[6] M A Ramdhani, H Aulawi, A Ikhwana and Y Mauluddin 2017 Model of Green Technology Adaptation in Small and Medium-Sized Tannery Industry Journal of Engineering and Applied Sciences 12(4) pp. 954-962

[7] S Sari, D M Aryana, C Z Subarkah and M A Ramdhani 2018 Multimedia Based on Scientific Approach for Periodic System of Element IOP Conference Series: Materials Science and Engineering 288(1) p. 012137

[8] I Farida, I Helsy, I Fitriani and M A Ramdhani 2018 Learning Material of Chemistry in High School Using Multiple Representations IOP Conference Series: Materials Science and Engineering 228(2017) p. 012078

[9] R Aisyah, I A Zakiyah, I Farida and M A Ramdhani 2017 Learning Crude Oil by Using Scientific Literacy Comics Journal of Physics: Conference Series 895(1) p. 012011

[10] S Sari, R Anjani, I Farida and M A Ramdhani 2017 Using Android-Based Educational Game for Learning Colloid Material Journal of Physics: Conference Series 895(1) p. 012012

[11] F S Irwansyah, L Lubab, M A Ramdhani and I Farida 2017 Designing Interactive Electronic Module in Chemistry Lessons Journal of Physics: Conference Series 895(1) p. 012009

[12] I Helsy, Maryamah, I Farida and M A Ramdhani 2017 Volta-Based Cells Materials Chemical Multiple Representation to Improve Ability of Student Representation Journal of Physics: Conference Series 895(1) p. 012010

[13] F S Irwansyah, Y M Yusuf, I Farida and M A Ramdhani 2018 Augmented Reality (AR) Technology on The Android Operating System in Chemistry Learning IOP Conference Series: Materials Science and Engineering 288(2017) p. 012068

[14] N Whitton 2014 Digital games and learning: Research and theory (New York and London: Routledge)

[15] A Saepulloh and D D S Fatimah 2016 Pengembangan Sistem Pakar Diagnosis Penyakit dan Hama Jurnal Algoritma 13(1) pp. 149-156

[16] R Soleh, E Retnadi, and D Tresnawati 2015 Pengembangan Multimedia Pembelajaran Pendidikan Agama Islam dan Budi Pekerti Kelas IV Sekolah Dasar Menggunakan Metode Luther Jurnal Algoritma 12(1)

[17] J Morrison and K Flegel 2017 Interviewing Children and Adolescents: Skills and Strategies for Effective DSM-5® Diagnosis (New York: Guilford Publications)

[18] N C Barnyak and T A McNelly 2015 Young children and families in the information age in Supporting young children’s visual literacy through the use of e-books Dordrecht (Springer) pp. 15-41