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PREFACE

Welcome to the 3rd Proceeding of International Conference of Information Technology Systems and Innovation (ICITSI) 2016. The international conference was held in Bandung-Bali, 26-27 October 2016. ICITSI 2016 is hosted by School of Electrical Engineering and Informatics, Institut Teknologi Bandung, and sponsored by IEEE Joint Chapter of Education Society / Electron Devices Society / Power Electronics Society / Signal Processing Society (ES/EDS/PES/SPS), and Joint chapter of Control System Society / Robotics & Automation Society (CSS/RAS).

We invited world renowned academics for keynotes, namely Prof. Jemal H. Abawajy, PhD., DSc., SMIEEE (Director Distribute System and Security Research Cluster, Faculty of Science, Engineering and Build Environment, Deakin University) and Prof. Dr. Ir. Suhono H. Supangkat (KKTI, Institute of Technology Bandung).

We received **185** submissions for ICITSI 2016. After thorough reviews by reviewers, our Program Committee accepted **70** papers (acceptance rate: **37.84%**) for the conference. Afterwards, **62** from **70** accepted papers were officially registered for the conference noted by camera-ready submission for IEEExplore publication and conference proceeding. Later, all authors with registered papers are enlisted to present the paper at the conference. We would like to thank all invited speakers, authors, reviewers, participants, committee members, and sponsors for their supports and contributions in this conference.

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- Armein Z. R. Langi
- Yudi Satria Gondokaryono

Authors Index

Achiruzaman, Mohamad
Adijarto, Waskita
Adiprawita, Widyawardana
Ahmad, A.S
Aini, F. R. Q
Albarda, Albarda
Andika, Aditya
Angela, Dina
Anwar, Hairil
Ardiyanto, Igi
Ariyani, N. F
Arymurthi, A. M
Asrofi, Muhammad
Aulia, M. N
Bandung, Yoanes
Bastian, M. R
Budi, Indra
Cahyadi, A. I
Cahyaningsih, Elin
Candra, Sevenpri
Choridah, Lina
Choridah, Lina
Dewi, M. A. A
Dhany, Tirta
Engel, V. J. L
Febriana, Trisna
Firman, Rachmat
Firmansyah, C. M
Fitriana, A. N
Fitriani, Widia
Ginardi, Hari

Hanafi, M. B
Hanief, Shofwan
Hapsari, I. C
Hardi, Richki
Hendriana, Yana
Hermanoy, Erico
Hidayanto, A. N
Hidayat, Erzi
Husin, Nanang
Hutagalung, Maclaurin
Indrastuti, Reni
Indrayani, Rini
Irawati, Ira
Isdiyanto, Isdiyanto
Jati, A. N
Junaedi, Danang
Kamila, A. R
Karna, Nyoman
Kistijantoro, A. I
Kristianto, Edy
Kurniawan, N. B
Kurniawan, Roy
Kusumasari, T. F
Latifah, Retnany
Marliani, R. S
Mauliadi, Reza
Mengko, Richard
Mengko, T. L. R
Munajat, Enjat
Mursyidah, Mursyidah
Mutijarsa, Kusprasapta
Ni'mah, Iftitahu
Noprisson, Handrie

Novarena, N. S

Nugroho, H. A

Nurrohmah, Isnaeni

Nusantara, A. H. S

Pardede, H. F

Patola, I .E

Pawitan, G. A. H

Permanasari, A. E

Pratama, I. P. A. E

Pratama, Irfan

Pujiyono, Wahyu

Purwandari, Betty

Purwarianti, Ayu

Putra, E. D

Putra, S. D

Putro, B. L

Rahaditya, A. G. J

Rahayu, Puji

Rakhman, R. D

Rasdiana, Erna

Razan, Atsari

Riduan, Fitria

Rimawati, Yeni

Rochman, H. N

Rosiyadi, Didi

Rosmansyah, Yusep

Rumaisa, Fitrah

Sahar, Muzni

Sandhyaduhita, P. I

Saputra, W. A

Saralita, Madis

Sari, W. P

Sasmita, I. G. M. A

Sastrosubroto, A. S

Sembiring, Jaka

Sensuse, D. I

Setiana, Syerly

Setiawan, A. B

Shihab , M. R

Silvia, Silvia

Sirait, E. R. E

Siswanto, Joko

Solihadin, Oih

Suakanto, Sinung

Sucahyo, Y. G

Suhardi, Suhardi

Sukoyo, Sukoyo

Sunandar, Dadang

Sunarya, Unang

Susanti, I. D

Susilawati, Endah

Sutikno, Sarwono

Syamsudin ,Aries

Thohari, A. H

Tianur, Tianur

Ula, Mutammimul

Uluwiyah, Ana

Ummah, Khairani

Utama, D. Q

Utami, Marissa

Virdyananto, A. L

Wahyunggoro, Oyas

Wasitarini, D. E

Wibowo, W. C

Wijaya, Rifki

Wulandari, Yuni

Yap, Marcel

Yulfitri, Alivia

Yuliani, A. R

Yuliant, Rika

Yustianto, Purnomo

Zaenudin, Efendi

Zilvan, Vicky

Zulkarnaim, Nuralamsah

TABLE OF CONTENTS

A-01 **Analysis of Cause and Effect Relationship Risk using Fishbone Diagram in SDLC SPASI v. 4.0. Business Process**
Azzahra Ratu Kamila and Sarwono Sutikno

A-02 **Information Extraction in Statistics Indicator Tables using Rule Generalizations and Ontology**
Muhammad Rio Bastian and Ayu Purwarianti

A-03 **A Case Study on Integration of Conventional Learning System and ICT-based Learning for Job Training System**
Oih Solihadin and Yoanes Bandung

A-04 **A Review of Missing Values Handling Methods on Time-Series Data**
Irfan Pratama, Adhistya Erna Permanasari, Igi Ardiyanto and Rini Indrayani

A-05 **Performance Evaluation of RAID Using Software-Based Accelerator in Virtualization Environment**
Erico Hermanoy, Marcel Yap and Edy Kristianto

A-06 **Designing an Enterprise Architecture Government Organization Based on TOGAF ADM and SONA**
Cipta Muhamad Firmansyah and Yoanes Bandung

A-07 **Performance Measurement Framework of E- Library using Modified Quantitative Models for Performance Measurement System (QMPMS) Method for ICT Infrastructure**
Dewi Endah Wasitarini and Jaka Sembiring

A-08 **Business Process Improvement of District Government Innovation Service Case Study Cimahi Tengah District of Cimahi**
Silvia Silvia, Suhardi Suhardi and Purnomo Yustianto

A-09 **Modeling IT Public Value for ICT Performance Measurement in Government Organization**
Ivadia Elmina Patola, Suhardi Suhardi and Novianto Budi Kurniawan

A-10 **m-Government Implementation Evaluation using A Mixed Method Approach**
Handrie Noprisson, Nanang Husin, Marissa Utami, Puji Rahayu, Yudho Giri Sucahyo and Dana Indra Sensuse

A-11 **Trusted Big Data for Official Statistics Study Case: Statistics Indonesia (BPS)**
Ana Uluwiyah

A-12 **Data Profiling for Data Quality Improvement with Openrefine**
Tien Fabrianti Kusumasari and Fitria Riduan

A-13 **Public Demand to Whitelisting: Another Alternative for More Secure Internet Access**
Emyana Ruth Eritha Sirait

A-14 **Copyright Protection for Color Images based on Transform Domain and Luminance Component**
Asri Rizki Yuliani and Didi Rosiyadi

A-15 **A Centralized Design of Information Network Architecture for Local Government**
Erna Rasdiana and Yoanes Bandung

A-16 **Design of Software as a Service (SaaS) for Regional Data Service Case Study: Statistics Indonesia**
Dadang Sunandar and Albarda Albarda

A-17 **Expert System for Early Diagnosis Of Meningitis Disease Using Certainty Factor Method**
Danang Junaedi and Fitrah Rumaisa
A-18 **Design of Digital Asset Management System for Broadcasting Organizations**
Tirta Dhany and Yoanes Bandung
A-19 **Review on e-Portofolio Definition, Model, Type and System**
Dana Sensuse, Betty Purwandari, Indra Budi, Puji Rahayu and Nuralamsah Zulkarnaim
A-20 **System Security Requirement Identification of Electronic Payment System for Angkot using NIST SP 800-160**
Khairani Ummah, Kusprasapta Mutijarsa, Waskita Adijarto
A-21 **Evaluation of Internet-Based Long Distance Education at Universitas Padjadjaran**
Ira Irawati and Enjat Munajat
A-22 **Modeling Operational Model Data Governance**
Alivia Yulfitri
A-23 **Requirement Engineering for Open Government Information Network Development to Support Digital Startup in Cimahi City Indonesia**
Ahmad Hamim Thohari and Suhardi Suhardi
A-24 **Process Capability Assessment of Information Security Management using ISO/IEC 33072:2016 (Case Study in Statistics Indonesia)**
Yeni Rimawati and Sarwono Sutikno
A-25 **Information Security Governance on National Cyber Physical Systems**
Ahmad Budi Setiawan, Aries Syamsudin, and Ashwin Sasongko Sastrosubroto
A-26 **Measuring E-Learning Readiness in Metrology Training Center Ministry of Trade of Indonesia**
Reni Sri Marliani and Yoanes Bandung
A-27 **Remote Control System as Serial Communications Mobile using a Microcontroller**
Yana Hendriana and Richki Hardi
A-28 **Knowledge Sharing Filtering on OAI-PMH**
Rika Yuliant and Nyoman Karna
A-29 **Factors Influencing Knowledge Sharing among Students in Indonesia Higher Educational Institutions**
Handrie Noprisson, Nuralamsah Zulkarnaim, Erzi Hidayat, Rachmat Firman, Erwin Dwika Putra, Elin Cahyaningsih and Dana Indra Sensuse
A-30 **Linking Spatial Information of Cultural Heritage Metadata with Geo Linked Open Data**
Nurul Fajrin Ariyani, M. Bakhtiar Hanafi, Hari Ginardi and Madis Saralita
A-31 **NUSANTARA: A New Design of Knowledge Management System in Indonesia**
Elin Cahyaningsih, Dana Indra Sensuse, Wahyu Catur Wibowo, Retnany Latifah and Wina Permana Sari
A-32 **Adaptive and Personalized Learning System as Workshop Complement**
Trisna Febriana and Roy Kurniawan
A-33 **Interactive Learning Media Based on RPP ICT**
Wahyu Pujiyono, Yana Hendriana and Istiqomah Dwi Susanti
A-34 **The Cycle of Knowledge in Government Human Capital Management**
Elin Cahyaningsih, Dana Indra Sensuse, Aniati Murni Arymurthi, Wahyu Catur Wibowo and Wina Permana Sari

A-35 **The Influence of Knowledge Management Tools Utilization Towards Knowledge Management Readiness**
Muhammad Rifki Shihab and Yuni Wulandari

A-36 **Applying Analytic Hierarchy Process for Measuring Knowledge Management Readiness in Government Institutions**
Rhesa Darojat Rakhman, Achmad Nizar Hidayanto, Ika Chandra Hapsari, Puspa Indahati Sandhyaduhita and Indra Budi

A-37 **Applying Usability Testing to Improving Scrum Methodology in develop Assistant Information System**
Dana Sensuse, Puji Rahayu, Widia Fitriani, Isnaeni Nurrohmah, Reza Mauliadi, and Hadiyan Nur Rochman

A-38 **Hardware Design of Automatic Arowana Raiser**
Abdul Hakim Satria Nusantara, Agung Nugroho Jati and Rifki Wijaya

A-39 **pSPEA2: Optimization Fitness and Distance Calculations for Improving Strength Pareto Evolutionary Algorithm 2 (SPEA2)**
Efendi Zaenudin and Achmad Imam Kistijantoro

A-40 **Early Diagnosis Expert System Deficiency Vitamins and Minerals in Human Life**
Mutammimul Ula, Richki Hardi, Mursyidah, and Yana Hendriana

A-41 **Prototyping SMS Forensic Tool Application Based On Digital Forensic Research Workshop 2001 (DFRWS) Investigation Model**
A.A. Gde Jordi Rahaditya, I Gusti Made Arya Sasmita and I Putu Agus Eka Pratama

A-42 **User Acceptance of Human Resource Information System: An Integration Model of Unified Theory of Acceptance and Use of Technology (UTAUT), Task Technology Fit (TTF), and Symbolic Adoption**
Aditya Lukas Virdyananto, Made Ayu Aristyana Dewi, Achmad Nizar Hidayanto and Shofwan Hanief

A-43 **Toward Development of Automated Plasmodium Detection for Malaria Diagnosis in Thin Blood Smear Image: an Overview**
Wahyu Andi Saputra, Hanung Adi Nugroho and Adhistya Erna Permanasari

A-44 **Improvement Of Production System Efficiency and Production Capacity Using Line Balancing Method**
Syerly Setiana, Sevenpri Candra and Aditya Andika

A-45 **Optimal Path Planning of a Mini USV using Sharp Cornering Algorithm**
Muhammad Asrofi, Adha Imam Cahyadi and Oyas Wahyunggoro

A-46 **A Framework for 3D Virtual Game Using MOODLE, SLOODLE and Open Simulator Case Study: Training of House Building Data Collecting by National Statistical Office (NSO), Government Agency, BPS - Statistics Indonesia**
Mohamad Achiruzaman and Yusep Rosmansyah

A-47 **Color-Based Segmentation and Feature Detection for Ball and Goal Post on Mobile Soccer Robot Game Field**
Alinda Nur Fitriana, Kusprasapta Mutijarsa and Widyawardana Adiprawita

A-48 **Sensor Networks Data Acquisition and Task Management for Decision Support of Smart Farming**
Sinung Suakanto, Ventje J. L. Engel, Maclaurin Hutagalung and Dina Angela

A-49 **On Real Time Q-Log-based Feature Normalization for Distant Speech Recognition**
Vicky Zilvan, Iftitahu Ni'Mah, Asri R. Yuliani and Hilman F. Pardede

A-50 **A Study of Monte Carlo Localization on Robot Operating System**
Fitria Romadhona Quratul Aini, Agung Nugroho Jati and Unang Sunarya

A-51 **Acceleration of Finite Element Method for 3D DC Resistivity Modeling Using Multi GPU**
Hairil Anwar and Achmad Imam Kistijantoro
A-52 **Automated Detection of Breast Cancer Lesions Using Adaptive Thresholding and Morphological Operation**
Hanung Adi Nugroho, Muzni Sahar, Tianur Tianur, Igi Ardiyanto and Lina Choridah
A-53 **Gamification Framework for Designing Online Training and Collaborative Working System in Statistics Indonesia**
Isdiyanto Isdiyanto and Yusep Rosmansyah
A-54 **Classification Breast Cancer Ultrasound Images based on Posterior Features**
Hanung Adi Nugroho, Tianur Tianur, Muzni Sahar, Igi Ardiyanto, Reni Indrastuti and Lina Choridah
A-55 **Three-wheeled Omnidirectional Robot Controller Implementation**
Gusti Arif Hanifah Pawitan, Kusprasapta Mutijarsa and Widyawardana Adiprawita
A-56 **Public Services Satisfaction based on Sentiment Analysis**
Endah Susilawati
A-57 **Color Blind Test Quantification using RGB Primary Color Cluster**
Dody Qori Utama, Tati Latifah R. Mengko, Richard Mengko and Masyithah Nur Aulia
A-58 **Validated ERP Modules Requirement for Micro, Small and Medium Enterprise Fashion Industry in Bandung**
Joko Siswanto and Anggi Maulida
A-59 **Identification of Business System Based on Business Process of Small Culinary Enterprises**
Joko Siswanto and Nadia Shafira Novarena
A-60 **Business System Requirement for Small Craft Companies**
Joko Siswanto, Sukoyo and Atsari Razan
A-61 **Power Analysis Attack on Implementation of DES**
Septafiansyah Dwi Putra, Adang Suwandi Ahmad and Sarwono Sutikno
A-62 **IT Value Model Driven by Information and Services: A Conceptual Model**
Suhardi, Novianto Budi Kurniawan, Budi Laksono Putro, Purnomo Yustianto

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Interactive Learning Media Based on RPP ICT

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***Abstract*— The students meet constrains in process of teaching and learning activities in the classroom in handicraft materials with the videos of handicraft making process taken from YouTube as these videos are incompatible with the subject and have low quality. The research subjects were the application of interactive learning media for handicraft made-of-soft materials and multimedia-based entrepreneurship. The data collection in this research employed literature study; observation methods done by directly observing the learning methods in class; and interviewing the teacher of handicraft and entrepreneurship subject of the eleventh grade. At the needs analysis, the stages system conducted were user need analysis and data analysis. Subsequently, it was followed by system design, including the design concept (learning scenario in classroom, ICT learning scenarios, evaluation scenario), content design, script design and graphic design. The system testing used two test stages, namely Black box test and Alpha test. The Black box testing tried by the teacher is aimed to determine learning materials validity and the feasibility of multimedia application. Based on these data RPP ICT, it can be concluded that the application of interactive learning media based on RPP ICT field entrepreneurship is feasible to be used in the learning process.**

Keywords—Learning Media; Multimedia; Entrepreneurship; RPP ICT.

I. INTRODUCTION

The 2013 curriculum implementation training module explains that one of elements contributing to realize potential quality development process of the students is the curriculum. Competency-based curriculum initiated since 2004 and 2006 SBC have developed and continued into 2013 curriculum, covering integrated attitude, knowledge and skills competences. The active student learning through observing, asking, analyzing and communicating become the principle in the development of 2013 curriculum. In the observing activities, the students can observe, read, hear and listen the learning. Asking activities with is done orally or in writing and analyzing activities by connecting, determining relevancy, building the story/ concept in learning. And the students can communicate orally, using writing, images, graphics, tables, chart and others in the learning process [1].

SMK Negeri 1 Pengasih is one high school/ vocational school in Kulon Progo which runs 2013 curriculum. One compulsory RPP ICT curriculum in 2013 is handicraft and entrepreneurship. Handicraft made-of-soft materials and entrepreneurship learning material is a part of the course. This learning material is related handicraft with main materials which is soft in characteristics. Meanwhile, entrepreneurship material contains tips and ways to be entrepreneurs and business opportunities in the field of handicraft products.

The handicraft-making material is learned by the students by watching the tutorial videos from YouTube. Tutorial materials from *YouTube* are incomplete and incompatible with the subject, and the video's low quality become an obstacle for students in understanding the process of making handicrafts. Meanwhile, for the entrepreneurial materials, the students simply read from books and listen to the stories of entrepreneurial experience, hence examples are needed for real entrepreneurial experiences and presented before the students to motivate and foster the students' mindset in entrepreneurship.

Therefore, the teaching and learning activities in the classroom is less effective because the students spend too much time searching for information on the Internet. Curriculum 2013 which requires the students to learn actively and independently makes the students experiencing difficulties. Moreover, the presented materials are new and the aid is inadequate.

A teacher or educator is demanded to be more creative in implementing their learning, especially on teaching methods and learning media used. The learning media, as one of factors

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that can improve the learning quality also need to be supported by the innovation of teachers/ educators in the learning process. A teacher/ educator today with rapid technological developments should not be passive, without making innovations in their learning process. A teacher/ educator needs to be up-to-date with current technology, thereby in giving the material in their field, it would be interesting, full of innovation, particularly in the use of learning media, especially if the material being taught can be developed through the technological sophistication. In addition, the presence of innovations in the learning will greatly assist students in receiving the material provided. The technology usage in learning can be done in the use of media and multimedia learning [2].

Hofstetter explained in the book by M. Suyanto [3] that multimedia is the use of computers to create and combine text, graphics, audio, moving images (video and animation) by combining links and tools that allow the user to navigate, interact, create and communicate. The assistance of multimedia "Interactive Learning Media of Handicrafts Made-of-Soft Materials and Entrepreneurship" is later applied to SMK Negeri 1 Pengasih. Learning media is made according to 2013 curriculum and is expected to facilitate teachers in presenting the handicraft made-of-soft material and entrepreneurship to the students. In addition to facilitate the teachers, this learning media is expected to improve the students' interest in learning the material.

II. Literature Review

A. Theoretical Review

The research results conducted by Adang Danu Aw [4] entitled "Multimedia-Based Basic Football Technique Learning". this study employs a visualization program using interactive videos displaying full football movement. The research goal is to build visualization of the basic techniques of playing football based on multimedia as teaching aids in learning the football packed in the form of an interactive CD that can be used in teaching football. This multimedia application contains learning materials equipped with a tutorial and evaluation exercise. Based on the test results, it can be concluded that the program can run well and feasible to be implemented.

The research conducted by Ridwan [5] is entitled "Multimedia-based Physics Subject in the Main Material of Fluid Elasticity for the Eleventh Grade Students". This application provides several material simulations and practice exercise and the solutions for the exercise. Abstract concepts in physics which are hard to imagine should be supported by laboratory practice or physics using learning media aid so that students are helped to understand the physics concepts that are abstract. The objective of this research is to produce multimedia-based physics learning media on the subject of elasticity and fluid to complete and optimize available learning aids. This research results in the application of multimedia-based physics learning media that have been tested; the results can run well and can be used as an alternative media to improve learning process in the classroom.

The research results conducted by Hendriana, Y. et. al [6] The development of information technology, especially the gaming industry which is one of the growing gaming industry is important for brain development, to improve concentration and train properly and solve problems quickly because in the game there are various conflicts which requires us to solve it quickly and precisely

B. Theoretical Basis

1. Computer Based Learning

The use of computers in education is known as computer-assisted instruction (CAI). CAI (Computer-Assisted Instruction) is a delivery system based on microprocessor-based subject of which lesson is designed and programmed into the system. In this mode, the computer can display the learning, use various types of media (text, images, sound, videos), provide activities and learning atmosphere, quizzes or give interaction from students, evaluate students' answers, provide feedback and determine appropriate follow-up activities hence the students can interact actively. There are five types of CAI commonly used [9], namely:

a. Drill and Practice
   Drill and Practice type presents the subject materials to be studied repeatedly. This program type is appropriately used when a teacher presents exercises with accompanying feedback.
b. Tutorial
   This tutorial type presents the materials that have been taught or presents new material to be studied. This program provides opportunities to add subject materials already studied or not in accordance with the existing curriculum.
c. Simulation
   Simulation type provides the opportunity to test the ability of the real application by creating situations involving students to act on such situation.
d. Problem Solving
   The problem solving type presents problems for the students to solve it based on the abilities that they have acquired.
e. Instructional / Educational Games
   Instructional or Educational Game type is a program that creates the abilities in a game environment.

2. Multimedia Basic Concepts

Vaughan [8] describes that multimedia is a combination of texts, art, sound, images, animation and videos conveyed using computers or digitally manipulated and can be conveyed and/ or interactively controlled.

III. Research Methods

1. Research Subjects

Subjects in this research were handicraft made-of-soft materials interactive learning media and multimedia-based entrepreneurship. The system design created was expected to assist in the teaching and learning process at SMK Negeri 1 Pengasih.

2. Data Collection Method
   a. Interview Method
   The method was conducted by direct interviews with related party namely Eni Dwi Suharyanti as the teacher of handicraft and entrepreneurship subject in the eleventh grade at SMK Negeri 1 Pengasih.
   b. Observation Method
   The method was done by directly observing the objects and problems occurred on the research object.

This observation method directly observed learning procedure in the eleventh grade in handicraft and entrepreneurship learning [10].

c. Literature Study Method

The data search method was conducted by literature study, including the student book of Handicraft and Entrepreneurship materials, articles and internet, and referential books on the making of multimedia-based learning media.

IV. Result And Discussion

A. System Analysis

1. User Requirements

a. Teacher

The system design of the teacher is aimed to help facilitate the materials delivery to the students. The requirement stage of users starts from preparing the data associated with handicraft materials made-of-soft materials and entrepreneurship, exercises and evaluations obtained from handicraft and entrepreneurship teacher of the eleventh grade students at SMK Negeri 1 Pengasih in the form of Lesson Plan Based ICT (RPP ICT) Planning, reference books used and teaching and learning activities in the class. For video material, the data are obtained from image directly taken in the institutions and respondents approved by the teacher. Later on, the data are processed into data which will be implemented in the learning system and cannot be changed because they are already in accordance with the users' needs.

b. Students

The system design from the students is aimed to facilitate the students to learn independently without explained by the teacher. The students therefore can understand the learning material regarding handicraft made-of-soft materials and entrepreneurship; listen to videos on handicraft made-of-soft materials and entrepreneurship; and understand the comprehension level of the materials by doing exercises and evaluation.

2. System Requirements

System requirements analysis is an analysis of the data in the system design requirements. The system built in this research is the application of instructional media about the craft of soft materials and multimedia-based entrepreneurs using Adobe Flash Professional CS6 software, CorelDraw X6, adobe premiere pro, adobe after effects, adobe audition CC.

B. Design Concepts

The learning model Computer Assisted Instruction (CAI) to be a reference in the design concept [11]. CAI models were applied, namely:

1. Model Tutorial

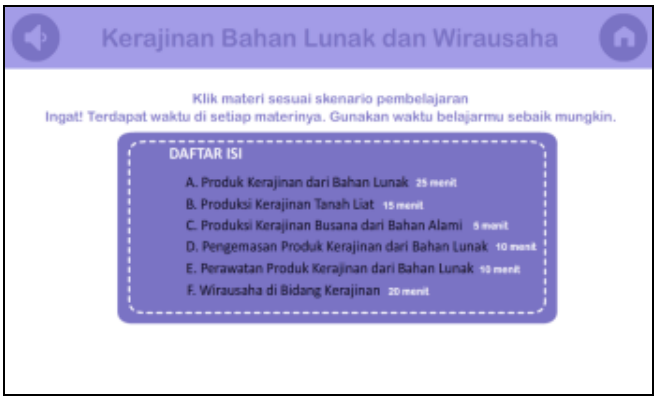

Fig. 1. Display module pages of material

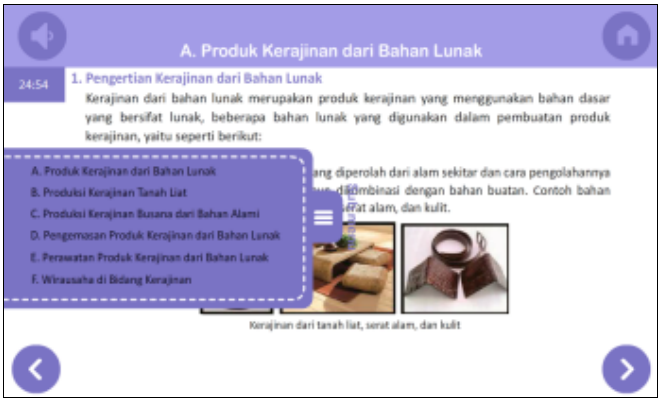

Fig. 2. Display the sub menu page module material

Model tutorial module presents the material in the form of text summary description and pictures of the craft of soft materials and entrepreneurs. On Figure 1 any material given a different time limit. When opening the material Figure 2 there are sub menus material that serves to facilitate the user when an error occurs while to get into one material.

2. Model Simulation

Fig. 3. Display animation craft pulp

Fig.4. Display animated fashion production from natural materials

Fig.5. Display video tutorial craft production process from clay

Fig. 6. Display entrepreneurship videos

The simulation model presents a simulated form of animation craft pulp Figure 3 which describes the processing of paper into crafts, animation production of clothing from natural materials Figure 4 with a step by step explanation in the manufacture of clothing, video tutorials production process craft of clay Figure 5 and videos about entrepreneurship in the craft who share the experience in entrepreneurship Figure 6.

3. Model Exercise

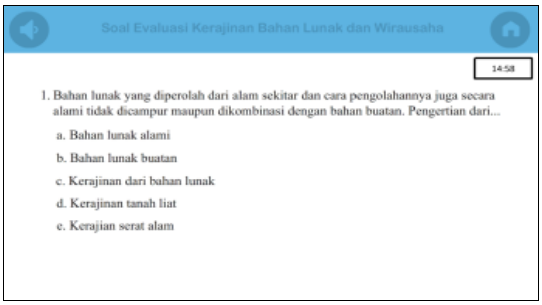

Fig.7. Display page evaluation questions

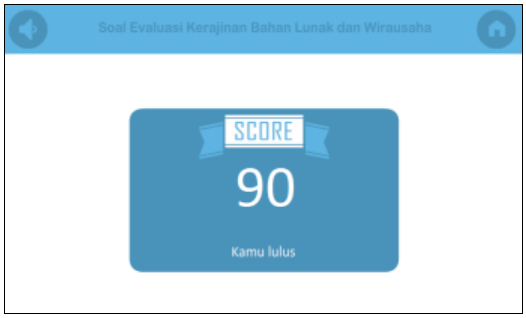

Fig. 8. Display of evaluation results page with the comment pass

Models present the evaluation exercise Figure 7 to provide a series of multiple-choice questions with a duration of working time 15 minutes and at the end Figure 8 students can see the final value achieved with the comment that states pass or not.

4. Game Model

Fig. 9. Display exercises page 1

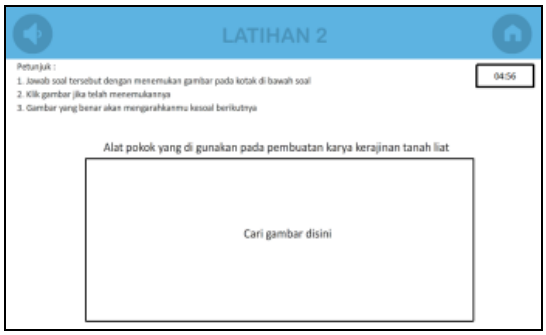

Fig. 10. Page views exercises 2

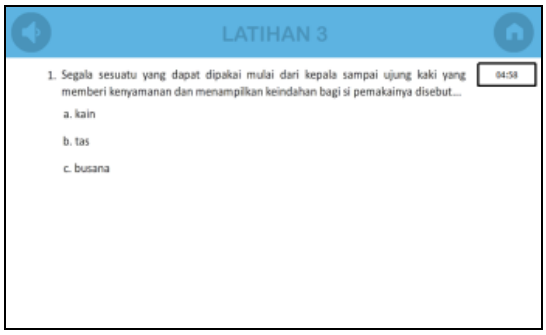

Fig. 11. Display page of exercises 3

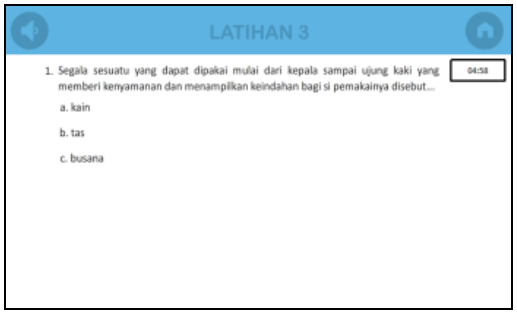

Fig.12. Display page of exercises 4

Game model presents exercises to provide games that are fun to play while learning. There are four exercises on this application. For exercises 1 to 3 have a duration of 5 minutes. Exercises 1 Figure 9 in the form of guesses to answer the question with an interesting answer to the question the answer box below. Exercises 2 Figure 10 in the form of guesses to answer the question by looking picture right answer. Exercises 3 Figure 11 in the form of multiple choice questions that the end of the matter can know the answer. Exercises 4 Figure 12 in the form of a discussion with a duration of about 10 minutes.

C. Testing

Testing the system uses two types of testing such as:

a. Black Box Test

Testing the system using a blackbox test aims to find out the truth of the subject matter and the feasibility of multimedia applications are tested by Eny Dwi Suharyanti as a craft teacher and class Enterprise XI. Based on the results obtained by counting number of answers divided by the number of questions multiplied by 100%, the percentage of votes against the application system is to agree ratings 17/17 x 100% = 100%, Disagree 0/17 x 100% = 0%. From the results of these assessments can be concluded that the application of interactive learning media handicrafts from soft materials and multimedia-based entrepreneurs are in accordance with the needs of teachers and feasible to be used as an alternative media in presenting material aids handicraft made from soft and entrepreneurs in the craft and entrepreneurial subjects.

b. Alpha Test

Testing the system using alpha test aims to test the feasibility of instructional media as tools for learning more effective and attractive so as to motivate students in independent learning. This trial due by 30 students of class XI by trying to run applications that have been designed learning media. When students have completed work on the problems run the application and evaluation of the application, the result is the best value of 30 students are as follows.

From the results of the students scored above the standard 75 KKM. It can be concluded that the results of student evaluation is very good. The next question questionnaire distributed a questionnaire to each student who has tried learning media applications. Assessment is done by counting the number of each answer choice answers divided by the total number multiplied by 100% in the completed questionnaire sheet. Then the percentage of votes obtained results to strongly agree 62/240 x 100% = 26%, agree 171/240 x 100% = 71%, disagree 7/240 x 100% = 3% and disagree 0/240 x 100% = 0%. Thus, the percentage of the number of the most widely agreed to be used as a tool in the learning process students learn the craft material of the soft material and entrepreneurs.

V. Conclusion

Based on the research results and discussions previously described, the conclusions made are as follows:

1. Attractive and interactive learning media for handicraft-made-of-soft materials and multimedia-based entrepreneurship have been made using several multimedia elements, including text, images, sound, animation and videos.
2. The research impacts are the teaching and learning activities in the classroom becomes easier and more enjoyable, the students are more enthusiastic in the attending the study, the implementation of learning time ismore effective, and helping the students in their independent learning material on handicraft made-of-soft materials and entrepreneurship.

References

[1] Modul Pelatihan Implementasi Kurikulum 2013, 2014, "Materi Pelatihan Guru Implementasi Kurikulum 2013 Tahun 2014 Mata Pelajaran Prakarya dan Kewirausahaan SMA/SMK", Badan Pengembangan Sumber Daya Manusia Pendidikan dan Kebudayaan dan Penjaminan Mutu Pendidikan, Kementerian Pendidikan dan Kebudayaan, Jakarta.

[2] Hannah et al. 2012. Multimedia Pembelajaran Seni Musik Berbasis Teknologi Informasi. Fakultas Bahasa dan Seni. Universitas Negeri Yogyakarta

[3] M. Suyanto. 2005. Multimedia Alat untuk Meningkatkan Keunggulan Bersaing. Yogyakarta: Andi Offset.

[4] Adang Danu Aw. 2010. Multimedia-Based Basic Football Technique Learning.

[5] Ridwan. 2009. Multimedia-based Physics Subject in the Main Material of Fluid Elasticity for the Eleventh Grade Students.

[6] Hendriana, Yana, and Renna Yanwastika Ariyana. "Multimedia adventure game folklore "Doyan Nada" for improving the cultural understanding of Sasak (Lombok) to children." *Intelligent Technology and Its Applications (ISITIA), 2015 International Seminar on*. IEEE, 2015.

[7] Nugraha, Adam. 2011. Computer Assisted Instruction (CAI). http://nuabah.blogspot.co.id/2011/03/computer-assisted-instruction-cai.html. Bandung. Accessed on March 29, 2016 at 22:26

[8] Vaughan, T. 2004. *Multimedia: Making It Work*. Edisi ke-6. New York: McGraw-Hill Companies.

[9] Arsyad, Azhar. 2011. *Media Pembelajaran*. Jakarta: PT Raja Grafindo Persada

[10] Hendriana. Y.. Pranolo. A.. Sulaiman. S.. & Fong. L. H. (2015. October). Generic shopping mall directory mobile application. In *2015 International Conference on Science in Information Technology (ICSITech)* (pp. 363-368). IEEE.

[11] Asnawir dan M. Basyiruddin Usman. *Media Pembelajaran*. 2002. Jakarta: Ciputat Pers.