User Interface Design of Multimedia-Based ICT Learning Module

Yanuard Putro Dwikristanto and Tanti Listiani

University of Pelita Harapan, Tanggerang, Banten

{yanuard.dwikristanto, tanti.listiani}@uph.edu

Keywords: ICT, Learning Module, Multimedia, Diverse Learners.

Abstract: Information and Communication Technology has been growing very rapidly. It allows varieties of multimedia-based elements of media learning to support more meaningful learning. The ability to use Information and Communication Technology must be mastered by students including student-teachers. Students at Pelita Harapan as Teachers College University came from various regions and culture throughout Indonesia. However, not all the students got adequate computer learning in their high school, and this difference affect their ICT skills. This study aims to develop multimedia-based ICT learning module. The data of students' ICT skills, socio-cultural background, and learning styles were collected through questionnaires and interviews. The results then analysed and developed into a user interface of the learning module. The user interface designed to accommodate different skill, cultural background and learning styles of the students. Lastly, the module made successfully and it can be used to help students in mastering the learning of Information and Communication Technology appropriately.

1 INTRODUCTION

Information and Communication Technology ought to be mastered by student-teachers for education field. At least, they should know how to use application programs such as word processing, spreadsheet, and slide presentation. According to Newby et al. (2006) and Shelly et al. (2006) these application programs are the most well-known programs and can be used as aid tools for carrying out daily works.

Student-teachers of Education Faculty of Pelita Harapan University come from various regions and culture throughout Indonesia. Not all of the students got adequate computer learning in their high school. These diversities affect them how to learn ICT skills. They learn ICT in their first-year college. In the class, they got support from lectures and their seniors as ICT tutors. But, they found difficulties when they did their ICT homework. Even, many of senior students didn't use these application programs well as expected in their first-year ICT class after they levelled up to second, third and fourth year.

Learning module could be an answer to solve learning difficulties (Depdiknas, 2008). There are six characteristics of learning module. There are self-instructional, self-contained, stand-alone, adaptive, user friendly and consistent (Anwar,

2010). Self-instructional means not dependent on other parties. Self-contain means comprehensive learning materials. Stand-alone means not dependent on or be used in conjunction with other media. Adaptive means keep pace the development of science and technology. User friendly means meet the familiar rules with the learner. Consistent means constant in the use of fonts, spacing, and layout.

Learning module, which is systematically and interestingly arranged in accordance to the needs of learners, could help students learn to achieve the desired learning objectives by themselves (Winkel, 2009). Based on survey to the first-year student-teachers, it is known that spreadsheet is the most difficult application program among word processing and slide presentation. They are struggling enough to develop their spreadsheet skills. Per this survey, it is also known that their visual-auditory learning style is also the biggest among auditory-kinesthetic and visual-kinesthetic. Visual and auditory persons learn abundantly from what they see and hear (Tileston, 2010). Multimedia concept could meet the needs of visual and auditory persons. Multimedia means multiple media. The media can be still graphics and photographs, sound, motion video, animation, and/or text items combined in a product whose purpose is to communicate information in multiple ways (Roblyer and Doering,

2010). There are five elements could be integrated in multimedia. They are text, image, animation, audio and video. These five elements could be understood by seeing and or hearing. Based on these backgrounds, Spreadsheet Learning Module will be developed on multimedia concept as a pilot model for ICT Learning Module.

2 RESEARCH METHODS

This research method is a research and development (RnD). The module is developed using ASSURE model. ASSURE is one of instructional system design model. It was developed by Sharon E. Smaldino, James D. Russel, Robert Heinich, and Michael Molenda. This model is very appropriate to develop instructional system design related with media and technology (Pribadi, 2009). ASSURE stands for Analyse learners; States objectives; Select methods, media, and materials; Utilize materials; require learners' participation; then Evaluate and revise. The learners as the participant of the research are first year student-teachers from economics, social, and physics study programs. They are 80 student-teachers. They are studying ICT Essentials subject this 2017/2019 odd semester.

3 RESULTS AND DISCUSSION

The result of the research is describing the first four steps of ASSURE through quantitative and qualitative data. These four steps are (A) analyse learners; (B) states objectives; (C) select methods, media, and materials; and (D) utilize materials.

3.1 Analyse Learners

Analyse Learner was conducted to find out the learning style and ICT skill level of student-teachers. Based on survey to 80 student teachers, there are 65 student-teachers have visual-auditory learning style, 13 student-teachers have auditory-kinesthetic, and 2 student-teachers have visual-kinesthetic. Figure 1 shows the pie chart of learning style comparison of the student-teachers.
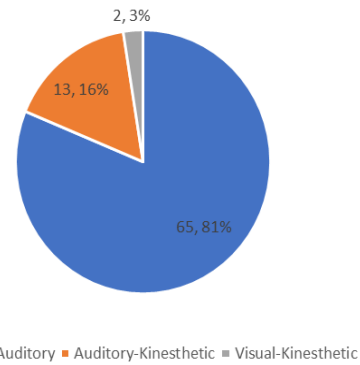

Figure 1: Learning Style Student-Teachers.

It shows that visual-auditory is the biggest learning style of the student-teachers among auditory-kinesthetic and visual-kinesthetic. These mean that most of the student-teachers could easily understand the lesson through what they see and hear.

Student-teachers ICT skill level is also surveyed. They fill number 1 to 5 to know about their skill level of word processing, spreadsheet, slide presentation and internet. Number 1 means very difficult. Number 2 means difficult. Number 3 means neutral. Number 4 means easy. Number 5 means very easy. Spreadsheet got the lowest score among word processing, slide presentation and internet. Figure 2 shows the bar chart about the skill level of word processing or Ms. Word, spreadsheet or Ms. Excel, slide presentation or MS. PowerPoint (PPT) and internet.
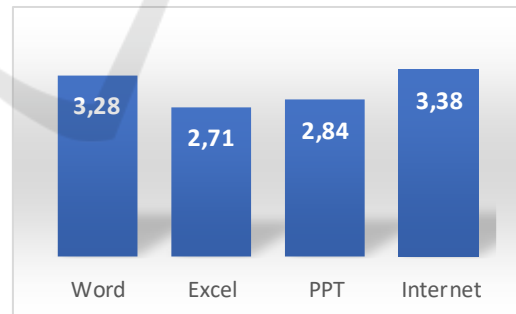

Figure 2: ICT Skill Level.

It shows that their spreadsheet or excel skill level is below three and lower than PPT. This means excel is difficult for them.

3.2 States Objectives

Based on the analyze learners result and ICT course outline, the objective of the module is determined. The purpose of the module will be focused on the

spreadsheet or Ms. Excel skills. The module will be designed and developed based on multimedia concept to accommodate visual and auditory learning style of student-teachers. The state objectives of the module are by surfing the content in ICT Interactive Tutorial Module Excel Part:

- Session One: Student teachers are expected to be able to remember and understand the basics of Excel 2016 Application Program by answering the problem of theoretical tests and working on the given practice questions appropriately;
- Session Two: Student teachers are expected to understand the use of formulas in Excel and apply them through the completion of various cases of data and numerical data management appropriately;
- Session Three: Student teachers are expected to use table and graphics facilities in Excel to present data in an interesting and meaningful way so that data can be read easily through the work of various case-given problems appropriately.

3.3 Select Methods, Media, and Materials

Students are expected to be able to learn self-instructionally without lectures or tutors. The method to be used is by using learning module. This module will be developed in digital form with computer program. The module will be set to be surfed interactively.

The media will be used is computer that supports visual and audio devices. The selected computer program to develop the interactive module is PowerPoint 2016. PowerPoint was chosen because this program could support multimedia aspects including text, images, animation, audio and video powerfully. Besides, it is more familiar and easier to design and develop audio visual learning media using PowerPoint.

The material in the module is about Excel skill. It is divided in three sessions. In session one, the module will discuss about Excel Menu, Work Area, and Cell. In session two, it will discuss about Formula skill in Excel, using arithmetic operator and function. In session three, it will discuss about conditional formatting, sort and filter, chart, and pivot table and chart.

The module is designed in three main parts. They are opening, main menu and closing. The openings are apperception and learning objective.

Apperception will prepare student-teachers to be ready to enter the learning module. There are some provocative sentences to attract them browse deeper inside the module in apperception. Below is the user interface of Opening Apperception (see Figure 3).
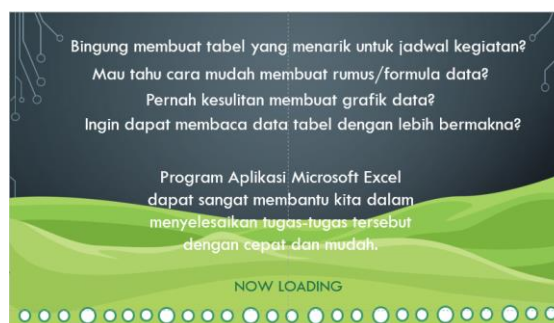

Figure 3: Opening Apperception.

The second opening is learning objective. Learning objective will be shown after apperception. After that student-teachers could continue to enter the menu of the learning module. Below is the user interface of the Opening Learning Objective (see Figure 4).

Figure 4: Opening Learning Objective.

There is also an option if the student-teachers cancel to enter the module. They could click the "X" button. It will close the learning module. If they click continue button they will be directed to the main menu of the learning module.

The main menu of the learning module consists of three parts. The first is *"Kenalan dulu yuk!"*. If they click it, they will be directed to beginning explanation about the main topic in each session. The second is "Menu". If they click it, they will be directed to the main menu of each session topic. The third is *"Penutup"*. If they click it, they will be directed to the end part of the learning.

Below are user interfaces of Learning Module Main Menu (see Figure 5) and Main Menu of Session Topic (see Figure 6).
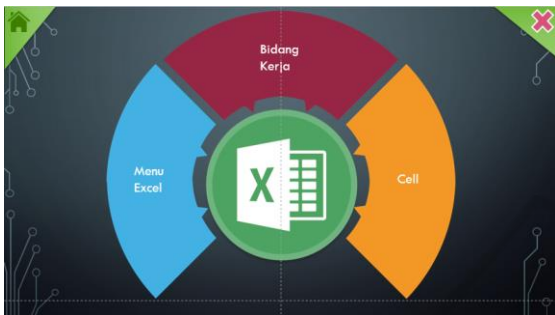
Figure 5: Learning Module Main Menu.

Figure 6: Main Menu of Session Topic.

They could click house button if they need to go back to the Learning Module Main Menu (Figure 5) from Main Menu of Session Topic (see Figure 6).

If they click to one topic of the menu, they could be directed to the sub topic menu. For example, if they click menu "Cell" in the Figure 6, then Sub Topic Cell Menu will be shown up with 4 options. Below is the user interface of Sub Topic Cell Menu (see Figure 7).

Figure 7: Sub Topic Cell Menu.

They could click the back button "←" if they need to go back the topic menu (see Figure 6) from Sub Topic Cell Menu (see Figure 7).

The detail explanation of topic and or sub topic selected will be done step by step and

systematically. Below are two examples of user interface of Format Cell explanation. These will be shown after them select "1. Format Cell" in the Figure 7.
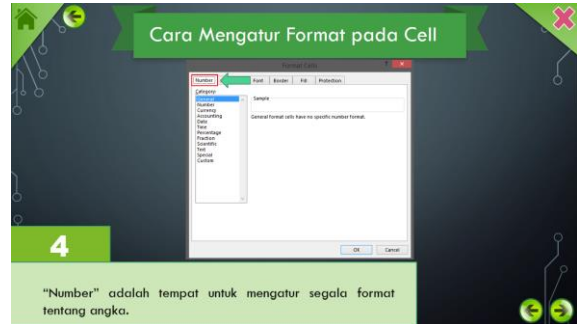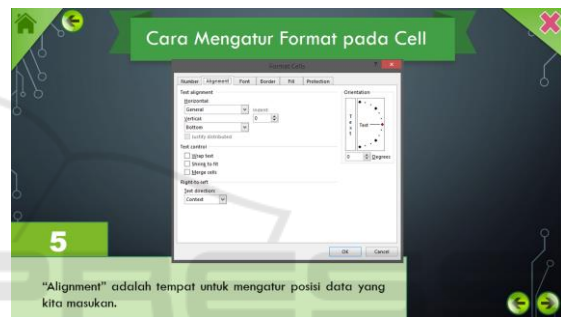

Figure 8: Step 4 Format Cell.

Figure 9: Step 5 Format Cell.

In Figure 8 and 9, they could see the title first, then the dialog button explanation will appear in the middle with red box will blink to point the place, after that the explanation of text will run below with the step number. They could select next button "→" to continue or previous button "←" to go back to previous step.

The closing user interface is the end interface of the learning module (see Figure 10). They will see the conclusion, provocative statement to continue learn next session, and credits in the closing user interface.
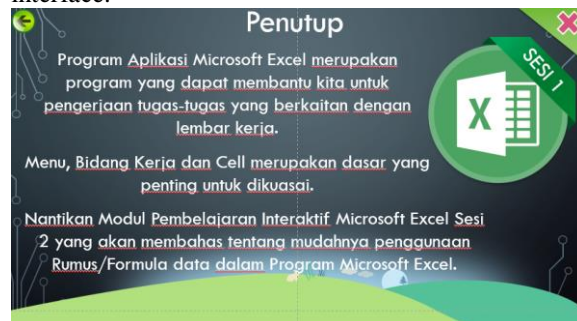

Figure 10: Closing.

If they need to go back to the learning module, they could click the back button "←". It will lead them to the opening of the learning module.

This module is also equipped with instrumental music from the beginning. It will accompany student-teachers while they surf the learning module.

3.4 Utilize Materials

Before the student-teachers use the learning module, designer and other ICT lectures first test it. The result is very good. The visual image is clear, the text is simple, the font and layout are consistent, the music sounds modern and energetic. But, the navigation is still confusing especially in Learning Module session 2. It needs to be fixed. Nevertheless, in general they recommend these to be used soon to the student-teachers since they feel that it will help much the student-teachers to learn self-instructionally about Excel.

This ICT Interactive Tutorial Module Excel Session 123 could be played in every Personal Computer with Microsoft Office 2007 or above inside it. It needs also active speaker or earphone to listen the music background. They also need mouse, so they could select the list menu, options and browse easily the module.

4 CONCLUSIONS AND RECOMMENDATION

The ICT Interactive Tutorial Module Excel Session 123 has already designed and developed. The user interface design has accommodated multimedia elements such as text, images, animation, audio and menu navigation. These elements could be designed and developed using PowerPoint.

Even though in general this module gets good approval, the navigation in Session 2 needs to be fixed. After that the development of this learning module could be continued to the step 5. Step 5 is Requires Learners Participation. In this step, student-teachers will use the module as users. After step 5 is step 6, the last step of ASSURE method. It is Evaluate and Revise. In this step, all users could give their evaluation of the learning module when they used it. If there is something needs to be revised, then the revision will be done to improve the quality of this learning module.

REFERENCES

Pribadi, B. A., 2009. *Model Desain Sistem Pembelajaran: Langkah Penting Merancang Kegiatan Pembelajaran yang Efektif dan Berkualitas*. Jakarta: Dian Rakyat.

Depdiknas., 2008. *Panduan pengembangan bahan ajar*. Dirjen Dikdasmen Direktorat Pembinaan SMA.

Tileston, D. W., 2010. *What Every Teacher Should Know About Diverse Learners*. California: Corwin Press.

Shelly, G. B., Cashman, T. J., Gunter, G. A., Gunter, R.E., 2006. *Teachers Discovering Computers: Integrating Technology and Digital Media in the Classroom.* Boston: Thomson.

Anwar, I., 2010. *Pengembangan Bahan Ajar: Bahan Kuliah Online*. Bandung: Direktori UPI.

Roblyer, M., Doering, A. H., 2010. *Integrating Educational Technology Into Teaching*. Boston: Pearson.

Newby, T. J., Stepich, D. A., Lehman, J. D., Russel, J. D., 2006. *Educational Technology for Teaching and Learning* (3rd Ed.). New Jersey: Pearson Prentice Hall.

Winkel, 2009. *Psikologi Pengajaran*. Yogyakarta: Media Abadi.