Developing vocational synthetic video motion learning using motor slider

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Developing vocational synthetic video motion learning using motor slider

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Abstract. We describe a method for improving the function of the manual slider to be an electrical slider with a technique to enhance the quality, making the effect and removing the undesired camera shakes. The moving of the camera ball head used belt strapped to a motor with a simple electronic circuit using IC regulator LM 317 that can set the speed of moving to the right or left. This study has the objective to help the making of the video e-learning so that the results can be optimized, can reduce the video image shake due to hand power limited, so the video like as professional video. This research using Research and Development method (R&D). There are 10 steps according to the development of this model, namely the potential and problems, data collection, product design, design validation, design revisions, product testing, product revision, utility testing, product revision, and mass production. However, this study is limited to the following five steps to the first product revision. The conclusion that motor slider is overall valuable and well accepted educational tools to create video motion and the video results can be as video training.

1. Introduction

A video is a form of multimedia that conveys information through two simultaneous sensory channels: aural and visual. It often uses multiple presentation modes, such as verbal and pictorial representations in the case of on-screen print and closed-captioning [5,8]. Using audio-video materials in the classroom is nothing new since filmstrips were first studied during World War II as a training tool for soldiers [4] educators have recognized the power of audio-video materials to capture the attention of learners, increase their motivation and enhance their learning experience. Both the content and technology have developed considerably since that time, increasing the availability and the value of audio-video materials in the classroom. Media development mapped out by Barrett in as the table 1 below.

Table 1. Portfolio construction tool compared [3].

	Common Development Tools	Structure & Links	Player Available	Advantages	Disadvantages	Ease of Use* 1 = low skill 5 = high skill	Technology Required 1 = low tech 5 = high tech	Cost (with educator discount)
Relational Database	FileMaker Pro	Fields, records, or files linked by common fields	Yes	Flexible reporting, network-friendly, Web accessible, cross-platform	Size of files, requires player	4 to develop, 2 to use	3	$65–156
Hypermedia	HyperStudio, Digital Chisel	Electronic cards linked by "buttons"	Yes	Widely available in classrooms, construction tools included, some software cross-platform	Not easily Web-accessible (requires browser plug-in), view limited to screen size	3 to develop	3	$39–199
Multimedia Authoring	Macromedia Authorware, Director	Icon- or time-based environment	Self-contained	Most flexibility in development, CD-ROM, cross-platform	Steep learning curve	5	5	$128–699
Web Pages	Adobe PageMill, Claris Home Page, Composer	Pages viewed with a Web Browser (Netscape or Internet Explorer) using links created in HTML	Browser (free)	Web-accessible, cross-platform	Multimedia (video) not well integrated, complex authoring	2 with editor, 4 without	4	Free–$79
Adobe Acrobat	Adobe Acrobat Exchange	Postscript-based pages that can be navigated sequentially or by using bookmarks, links, or buttons	Reader (free)	Web accessible, cross-platform, create files from any application, ideal for CD-ROM, can capture Web pages with links	Size of files, limited construction tools	2	4	Exchange is $40–90
Slideshows/ Presentations	Microsoft Works, PowerPoint, AppleWorks	Slideshow presentation or "Binder" (Microsoft Office) to link documents together	No	Widely accessible software, cross-platform	Not directly Web-accessible, difficult to create hypertext links, requires original application to read	3	3–4	$46–210
Digital Video	QuickTime or AVI format, Movie Player Pro (for editing), AppleVideo Player (for digitizing), Avid Cinema, iMovie	Record performances in and out of the classroom; digital video editing can be used to prepare artifacts for presentation	QuickTime, RealPlayer (both free)	Web access, high interactivity, random access, editing	File size, storage quality, bandwidth requirements, hardware requirements to digitize video	Level 5 skill needed to create digital video, although with tools such as Avid Cinema and iMovie, the learning curve is flatter	5 to use computers with video digitizing boards. Digital-video cameras streamline the process, especially with the latest computers	Editing software from $29 (MoviePlayer Pro) to ≥$500 DV cameras <$1,000.
Analog Video	Video on tape: VHS, 8mm	Standard video used to capture performances in and out of the classroom; also a universal format for final presention portfolio	All that is required is a VCR	Ubiquitous access, cheap storage medium, acceptable quality, hardware requirements	Linear access, low interactivity, no Web access	Level 2 skill needed to create analog video, although editing analog videotape is more complicated	Can be recorded with low-end equipment	Other than the cost of a camera or VCR, the only additional cost is videotape; analog video editing system ≥ $250; 8mm camera ≥ $300

2. Literature review

An electronic circuit that is used to regulate the voltage of the motor shown in figure 1:

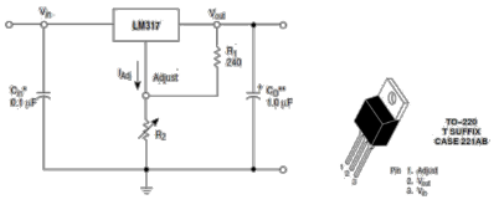

Figure 1. Electronic circuit using IC LM317.

Internal Short-Circuit Current Limiting Constant with Temperature, Output Transistor Safe-Area Compensation, Floating Operation for High Voltage Applications, Eliminates Stocking many Fixed Voltages, Available in Surface Mount D PAK-3, and Standard 3-Lead Transistor Package, NCV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable These are Pb-Free Devices. An electronic circuit using IC LM317 is an adjustable 3-terminal positive voltage regulator capable of supplying in excess of 1.5 A over an output voltage range of 1.2 V to 37 V. This voltage regulator is exceptionally easy to use and requires only two external resistors to set the output voltage. Further, it employs internal current limiting, thermal shutdown, and safe area compensation, making it essentially blow-out proof. The LM317 serves a wide variety of applications including local, on card regulation. This device can also be used to make a programmable output regulator, or by connecting a fixed resistor between the adjustment and output, the LM317 can be used as a precision current regulator [1].

The research conducted in developing online test application using CodeIgniter framework in Vocational High School (SMK). From the validator, it can be obtained from the media expert value of 81.25% which means the application is very valid and can be used. From the validation expert about the aspect of Validation, Content gets a valid value which means can be used, while the aspect of Language and Writing Problem gets a very understandable value which means can be used in testing. According to research by User Acceptance Testing (UAT), applications can be received very well by the students and can be used to do the final semester or midterm's exams [10].

An instructional media is needed to help students achieve the best learning outcome. The method used was Research and Development (R&D) using post-test-only in controlled quasi-experimental group design [8,11].

The terms Electronic Portfolio and Digital Portfolio are used interchangeably; however, there is a distinction. an Electronics Portfolio contains artifacts that may be in analog forms, such as a video tape, or may be in the computer-readable form: in a Digital Portfolio, all artifacts have been transformed into computer-readable form. An electronic portfolio is not a haphazard collection of artifacts (i.e., a digital scrapbook or a multimedia presentation) rather a reflective tool that demonstrates growth over time [3].

The use of video learning already explores [9]. Their research explores the uses of camera features on the cell phone to capture subjects in the creation of Javanese traditional wedding makeup using the traditional costumes of each area in Indonesia. The technique of taking a picture using mini glide cam which implemented to stabilize the video to eliminate shaking when still recording.

3. Method

The method of this research using the model of Research and Development (R & D) as figure 2. There are 10 steps according to the development of this model, (1) namely the potential and problems, (2) data collection, (3) product design, (4) design validation, (5) design revisions, (6) product testing, (7) product revision, (8) utility testing, (9) product revision, and (10) mass production. It takes an initial data collection to determine the potential and problem that could be developed and modify in the use of a manual slider to be an electric slider. Whether using the motor slider, can reduce the vibration video and the need for electronic circuits, as well as other supporting equipment. Then the design of electrical slider validated with the objective of motor slider design as the expectations. The next stage is the first test to determine the voltage requirement, if necessary, it needs to modification electronic circuits base on the basic circuit. This method is limited to utility testing.

Figure 2. Complete step using R&D method [11]

4. Results and discussion

This experiment using a design study with the Research and Development (R & D) [11] in 10 step, but this research is limited as: from the flowchart above can be explained namely: (1) Potential and

problems; the potential and problem that could be developed and modify in the use of a manual slider to be an electric slider.

Starting from a video produced some movement seen online courses can be unsightly and so we need a method or product that could dampen or reduce unwanted motion. The movement is commonly shaking when video camera recorder exposed for scratching or using the hand as a buffer that holds the camera well. Whereas the movement of the camera must be stable so that the resulting video does not disturb focus of learning and well received by learners, This study has the objective to help the making of the video e-learning so that the video results can be optimized, can reduce the video image shake due to hand power limited then the video like as professional.

Whether using the motor slider, can reduce the vibration video and the need for electronic circuits, as well as other supporting equipment. In this study, carried out a search on the website http://vi-learn.unesa.ac.id , there is kind of video learning with unstable motion, unfocused video subject, (2) the Data Collection ; Once the potential and problems can be shown in a factual and up to date, we then need to collect a variety of data that can be used as material for planning a video e-materials are expected to be used as a solution and produce a video e -material stable in this research, data collecting: a) collect material that is suitable and can be used as a video, b) make concept story board video e-materials, c) collecting pictures, music, and materials used in the development of video material, d) e-journal relevant research, (3) Product design ; the product design stage, which is produced a prototype, making video e-materials. This stage starts with making a slider, installing the motor, installing a circuit of the simple electronic motor drive as figure 3.

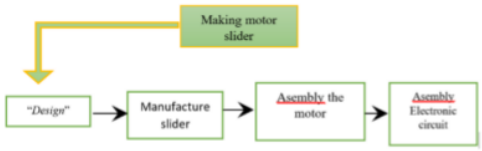

Figure 3. Step work on the manufacture of motor slider.

(a) (b)

Figure 4. (a) slider without the motor (b) slider with motor circuit

Design Validation; validation is the process of product design activities to assess the product. Validation is done for research instruments such as the observation sheets filled by three expert lecturers, namely, materials experts, media experts, and linguists. In this case, the product is partially multimedia video material subjects. Validation is done by seven lecturers are experts, subject matter experts, media experts, and linguists. Rate on video covers three aspects are considered, namely: a) format media assessed to see the opening menu of applications, the harmony of colour display background with the text, the clarity of the instructions for use and the buttons function properly, b) the video format assessed the suitability of video material that haircut (Graduation), video quality, image clarity, clarity of narration or audio, the suitability of music illustrations to support the display and buttons function properly, c) the format of the material assessed the suitability of the material with the theory, text settings, selecting the model and size of the text, an explanation letter, and buttons function properly, (5) Product Revision ; this step is to revise form as assessment, update question

form, (6) Product Validation; validation is the process of product design activities to assess the product. Validation is done for research instruments such as the observation sheets filled by three expert lecturers, namely, materials experts, media experts, and linguists. In this case, the product is partially multimedia video material subjects. Validation using UAT [2,10] is done by 7 lecturers are experts, subject matter experts, media experts, and linguists. Rate on video covers three aspects are considered, namely: a) format media assessed to see the opening menu of applications, the harmony of colour display background with the text, the clarity of the instructions for use and the buttons function properly b) the video format assessed the suitability of video material that barbershop base women (Graduation), video quality, image clarity, clarity of narration or audio, the suitability of music illustrations to support the display and buttons function properly c) the format of the material assessed the suitability of the material with the theory, text settings, selecting the model and size of the text, an explanation letter, and buttons function properly, (7) Product Testing 1 ; this step is testing the slider to generate video with certain conditions such as the length of the slider x cm takes a few seconds, with a certain voltage, (8) Utility Testing ; furthermore, It is known that the IC need protection using a diode. By using the formula

$$V_{out} = 1.25V \left(1 + \frac{R_2}{R_1}\right) + I_{Adj}\, R_2 \qquad (1)$$

When external capacitors are used with any IC regulator it is sometimes necessary to add protection diodes to prevent the capacitors from discharging through low current points into the regulator figure 4 shows the LM317 with the recommended protection diodes for output voltages in excess of 25 V or high capacitance values (C_O > 25 _F, C > 10 _F). Diode D_1 prevents C_O Adj from discharging through the IC during an input short circuit. Diode D2 protects against capacitor C discharging through the IC during an output short circuit. The combination of diodes D_1 and D_2 prevents C from discharging through the IC during an input short circuit. The modification circuit as figure 5. The formula

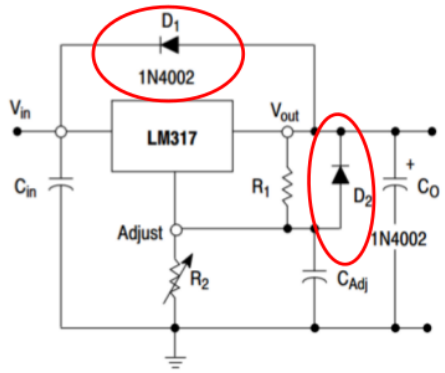

Figure 5. The basic circuit with diode modified

Table 2. Simulation results using slider motor

Distance (cm)	120	120	120	120
Voltage	3.4	8.3	11.7	16.5
Speed Time	25'97''	20' 11''	10'3''	6'51''

If the voltage applied to the motor is getting low, will produce motor movement slowly so that cameras are used to move slowly and the video motion effect will be produced, but if the voltage applied to the motor is high (in this case a maximum of 24 Volts) the motor movement into normal even faster, and motion video effect will not be generated. Symbol m meaning minutes, the symbol s means seconds.

5. Conclusion

It is important to modify the basic circuit using a diode to protect IC to be long life the motor and ensure the battery full charge and also to prevent the capacitors from discharging through low current points into the regulator IC. The research by User Acceptance Testing (UAT), applications can be received very well by the validator, and also suggests that slider motor can be supported to make synthetic video motion. This may be more suited to make video e-learning. The motor slider is overall valuable and well accepted educational tools to create slow motion video and the video results can be video training.

References

[1] Anonymous, *ON Semiconductor LM317, NCV31*, www.onsemi.com
[2] Davis F D 1989 Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly* **13** 3 p 319-340
[3] Barret H 2000 Create Your Own Electronic Portfolio, *Learning & Leading with Technology* **27** 7 p 14-21
[4] Hovland C I, Lumsdaine A A and Sheffield F D 1949 *Experiments on mass communication* (Princeton, NJ: Princeton University Press)
[5] Mayer R E 2001 *Multimedia learning* (Cambridge: Cambridge University Press)
[6] Miller P 2001 Learning styles: Multimedia of the mind (ERIC Document Reproduction Service No. ED 451 140)
[7] Wibawa S C 2013 Creative Industry Collaboration for The Creative Portfolio *International Conference on Creative Industry (ICCI)* p 265-367
[8] Wibawa S C, Beauty Media Learning using Android Mobile Phone *International journal publish on www.ijirae.com* 2349-2163 **2** 11
[9] Wibawa S C and Gareca C 2014 Students' Creative e-Portfolio: Using Android Cellphone Cameras for Inventive Beauty Photography *Proceeding International Conference on Advances in Education Technology (ICAET 2014)* p 121-124
[10] Wibawa S C, Wahyuningsih Y, Sulistyowati R, Abidin R, Lestari Y, Noviyanti and Maulana D A 2018 Online test application development using framework CodeIgniter *IOP Conf. Series: Materials Science and Engineering* **296**
[11] Wibawa S C, Cholifah R, Utami A W and Nurhidayat A I 2018 Creative Digital Worksheet Base on Mobile Learning *IOP Conf. Series: Materials Science and Engineering* 288-012130

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