

Lightboard: Inexpensive and Easy-To-Develop Media for Making Nursing Practicum Videos

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Abstract

Since the outbreak of the SARS-CoV-2 virus in Indonesia, the Government has closed schools and conducting learning from home, which forces universities to use distance education. One alternative is to use videos that have been shown to have a positive effect on student learning, satisfaction, engagement, interest, inspiring, and facilitating problem-solving. There is a new medium known as a “lightboard”, which is most often made up of a panel of glass surrounded by LED light that makes the writing luminous and highly visible on the camera. The purpose of this study was to develop a inexpensive and easy-to-develop lightboard media to make nursing practicum video. This study uses research and development methods. The object being developed is a lightboard media to make a practicum video. The results showed that the video made with lightboard as a medium have fulfilled the aspect of simplicity, clarity, convenience, educative, and attractiveness. Lightboards have proven to be effective as a medium for making practical videos that are inexpensive and easy-to-develop. Authors strongly recommends nursing study programs to use lightboards as a medium for making nursing practicum videos. Furthermore, research to test the effectiveness of light board media on other practical materials is recommended.

Keywords: *lightboard; video; nursing; learning*

Introduction

Since the outbreak of the SARS-CoV-2 virus in Indonesia on March 2, 2020, the Government of the Republic of Indonesia has issued various policies to break the chain of spread of the virus, One of them is closing schools and conducting learning from home, which forces universities to use distance education.

Costley & Lange suggest using video as an alternative because it has been shown to have a positive effect on student learning, satisfaction, engagement and interest ⁽¹⁾. Alpay et al, states that video as a communication tool can facilitating problem-solving, assisting in the mastery of learning, and inspiring and engaging students⁽²⁾.

McCorkle & Whitener mention that there is a new technology for making effective practical teaching videos, known as “lightboard” ⁽³⁾. The lightboard is a low-tech hardware for recording instructional videos created by Michael Peshkin, and registered under the name Lightboard Open Source Hardware Initiative ⁽³⁾.

Lightboards are most commonly constructed as a panel of glass surrounded by a strip of small LED lights that illuminate dry erase markers to make writing highly visible on camera ⁽³⁾. When using the Lightboard, instructors write text on a glass that is brightly illuminated such that text is highly visible on the board ⁽⁴⁾.

The purpose of this study was to develop a inexpensive and easy-to-develop lightboard media to make nursing practicum video. The authors uses the technique of interpreting the results of blood gas analysis by Hennessey and Japp as an example of a course given with lightboard media in this study ⁽⁵⁾.

Material and Methods

This study uses research and development methods. Research and development methods refers to activities for innovation by institutions or corporations to develop or improve their existing products or service ⁽⁶⁾. The object that being developed was a lightboard media to make a practicum video. The authors simplifies the steps of the research and development method into three parts, namely: (1) the preliminary study stage; (2) media development stage; and (3) the evaluation stage.

1. Preliminary study

In the preliminary study stage, authors searched for literature related to lightboard and the interpretation of blood gas analysis. The author uses the simplified interpretation method of blood gas analysis results by Hennessey and Japp ⁽⁵⁾.

2. Media Development

In the media development stage, the researchers carried out:

a. Initial design

At this stage, the researcher prepared all the raw materials needed to make light board media, along with other equipment for video production. The authors followed the construction considerations by Hay & Wiren as a design in this study ⁽⁷⁾.

The following were the materials prepared:

- Acrylic glass
 - LED strip light
 - Wood
 - Clamp
 - Neon marker
 - Microfiber Wipe
 - Plastic cleaner
 - Microphone
 - Black cloth
 - Camera & tripod
 - Lighting
- b. Video production

Authors records a video of the interpretation of the results of the blood gas analysis that is delivered on a lightboard media

c. Design validation by experts

Authors ask 5 participants, consisting of: 2 material experts (1 ICU nurse with more than 10 years experience, and 1 critical care nursing lecturer); 2 experts in learning communication media (1 lecturer in multimedia science and 1 professional video editor); and 1 learning design expert, to assessed the video. Authors used the Chaeruman online learning media evaluation instrument to assess whether the video has met the standards of effective learning video ⁽⁸⁾.

d. Small group trial

In small group trial the video were tested on Akademi Keperawatan Husada Karya Jaya's students who had passed the Emergency Nursing course

(n=30). Respondents were asked to watch and fill out a developed questionnaire (using google form). Aspects assessed by respondents are: (1) Simplicity; (2) Clarity; (3) Convenience; (4) Educational; and (5) Attractiveness, using a 4-point Likert scale (not enough; enough; good; very good).

e. Large group trial

Similar to the small group trial, in the large group trial, respondents (n=304) were also asked to watch videos and fill out a questionnaire (using google form). Aspects assessed by respondents are: (1) Simplicity; (2) Clarity; (3) Convenience; (4) Educational; and (5) Attractiveness, using a Likert scale.

Respondents who are included in the study are:

- 3-Year Diploma Nursing Student
- Have passed the emergency nursing course
- Willing to be a respondent by filling out a questionnaire (google form)

3. Evaluation

In the evaluation stage, the researcher create a final model of the lightboard media.

Results

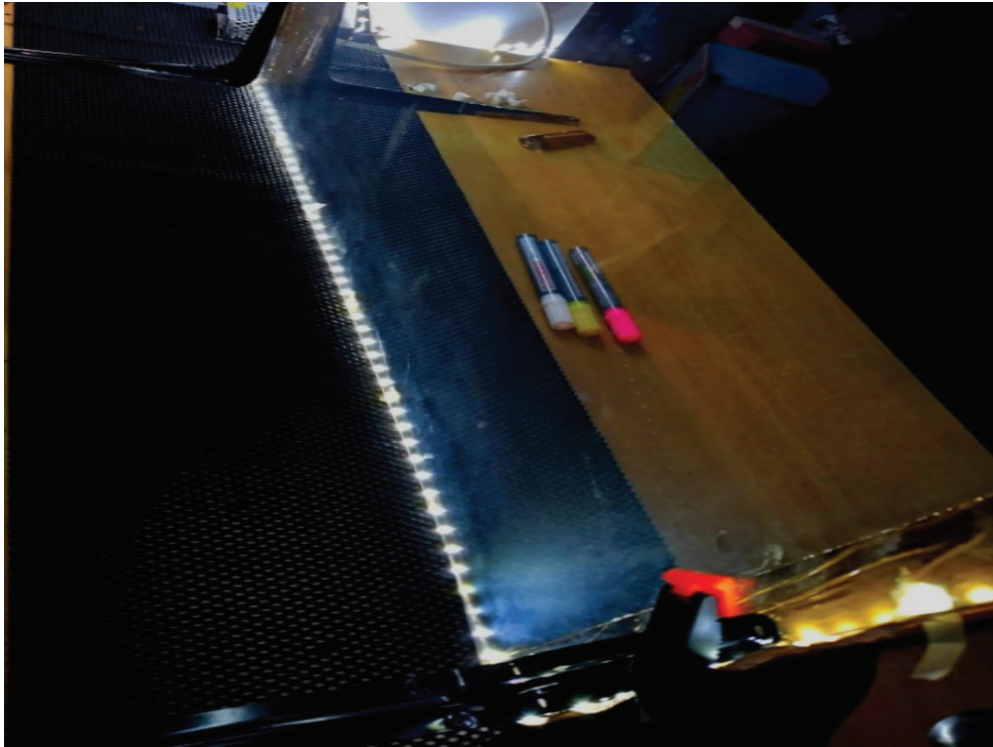
Initial Design

Authors use a custom built 100 x 100 cm plexiglass (acrylic glass). Wood was used as a frame so that the plexiglass can stand stable. The LED strip light is looped around the plexiglass to allow light to spread throughout the panel. Clamp is used for clamping panels to a wooden frame. Neon markers are special markers that glow when exposed to light. Microfiber Wipe is used to erase the text on the panel. The black cloth is used as a background for the teacher.

For the equipment for video production, authors uses a Canon EOS M mirrorless camera, Takara ECO 173A tripod, Boya BY M1 microphone to record the teacher's voice, and round lighting to make the teacher look bright, because the video production using lightboard media is carried out in dark conditions.



Picture 1. Initial Design of Lightboard



Picture 2. Initial Design of Lightboard

Video production

Authors records a video of the interpretation of the results of the blood gas analysis that is delivered on a lightboard media. To record the video, the authors places the camera across the board about 2 meters where the teacher sits with a black background. The teacher writes the technique for interpreting the results of the blood gas analysis on a light board while explaining.

After the video was recorded, the author edits the video using Adobe Premiere software, where the video was reversed so that the text that was seen from right-to-left (appears to be writing backwards) becomes from left-to-right (appears correctly written).

Design validation by experts

Material experts (n=2) judge that the video produced is correct and free from conceptual errors.

The expert also considered that the videos produced were up-to-date, both in terms of the scope and depth of the material, as well as in terms of the references used.

Experts in learning communication media (n=2) assessed that audio, narration, and the suitability of language and communication styles were in accordance with the characteristics of nursing students. The expert also considered that the accuracy of the use of intonation, tempo and rhythm with the purpose and content of the material was good.

Finally, the learning design expert (n=1) assessed that the video produced was in accordance with the media delivery strategy and the characteristics of nursing students, which allowed ease and speed of understanding and mastery of interpretation skills of blood gas analysis results. The expert also considered

that video could encourage its application in real life, and it was appropriate to provide the material with lightboard media.

At this stage, based on expert validation, the author draws the conclusion that the initial design of the light board has proven to be effective in conveying the material to the audience.

Small group trial

Videos that have passed expert validation were then tested on Akademi Keperawatan Husada Karya Jaya’s nursing students who had passed the Emergency

Nursing course (n=30). Respondents were asked to watch and fill out a questionnaire (using google form). The result is the average total very good grade of the five aspects is 88% (see table 1).

Large group trial

Similar to the small group trial, in the large group trial, respondents (n=304) were also asked to watch videos and fill out a questionnaire (google form). Respondents assessed that the video monitoring the results of blood gas analysis using light board media met the aspects of simplicity, clarity, convenience, educational, and attractiveness (see table 2).

Tabel 1. Small Group Trial Results

No	Aspect	Not Good Enough		Good Enough		Good		Very Good		Total	
		n	%	n	%	n	%	n	%	n	%
1	Simplicity	0	0%	0	0%	5	17%	25	83%	30	100%
2	Clarity	0	0%	0	0%	2	7%	28	93%	30	100%
3	Convenience	0	0%	0	0%	3	10%	27	90%	30	100%
4	Educational	0	0%	0	0%	2	7%	28	93%	30	100%
5	Attractiveness	0	0%	0	0%	5	17%	25	83%	30	100%

Tabel 2. Large Group Trial Results

No	Aspect	Not Good Enough		Good Enough		Good		Very Good		Total	
		n	%	n	%	n	%	n	%	n	%
1	Simplicity	0	0%	7	2%	10	4%	287	94%	304	100%
2	Clarity	0	0%	0	0%	6	2%	298	98%	304	100%
3	Convenience	0	0%	8	2%	17	6%	279	92%	304	100%
4	Educational	0	0%	0	0%	20	7%	284	93%	304	100%
5	Attractiveness	0	0%	0	0%	4	1%	300	99%	304	100%

The large group trial showed that the lightboard media have fulfilled the aspect of simplicity, clarity, convenience, educative, and attractiveness with the average respondent giving a very good score on the five aspects is 95,2%.

Evaluation Stage

The evaluation stage is the stage of making the final model of the lightboard media. Because the results of the large group trial were good, the lightboard made in the initial design stage was used as the final model.

Discussion

Lightboard was first coined by Michael Peshkin and registered under the name Lightboard Open Source Hardware Initiative. OSHWA (The Open Source Hardware Association's) defines open source hardware as "hardware whose designs are publicly available so that anyone can study, modify, distribute, create, and sell designs or build other hardware based

on those designs" ⁽³⁾. With the registration of the light board as open source, Peshkin, accompanied by the Google Group, has shared the idea and documentation of the light board design for free to the whole world.

Learning videos using light boards provide a stable pedagogical framework for conveying complex concepts ⁽⁴⁾, and can provide students with understanding, engagement, and satisfaction in learning ⁽⁹⁾.

Our findings show that light boards are effective in conveying the material to the audience. Respondents showed a very good response to the material explained with the lightboard. However, study programs must pay attention to what skills can be imparted through video lightboards, because not all skills can be taught remotely.

Based on the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/MENKES/425/2025 concerning Nursing Professional

Standards, not all nursing skills can be done online. There are skills that must be carried out directly to the patient, for example the skill of venous blood puncture samples written with an ability level of 4 (four). At skill level 4, nursing graduates must be able to do it independently, directly on the client, and be assessed directly through an action test in the clinic.

The results of a systematic review conducted by McCutcheon, Lohan, Traynor, & Martin show that online practicum teaching is no less effective than traditional methods ⁽¹⁰⁾, but Kelly, Lyng, McGrath, & Cannon say that online learning is better used to “complement” rather than replace the demonstration method ⁽¹¹⁾.

This study was descriptive in nature, there were several aspects that are not examined in this study, as well as the data analysis techniques used. Authors does not compare the lightboard with other learning media so that the picture of its effectiveness was also limited.

However, authors strongly recommends nursing study programs in Indonesia to use lightboards as a alternative medium for making nursing practicum videos. Furthermore, research to test the effectiveness of light board media on other practical materials, or compare it with others learning media is recommended.

Conclusion

Lightboard is a inexpensive and easy-to-develop learning media to make nursing practicum videos as an alternative to online learning during the Covid-19 pandemic, or in the future.

Conflict of Interest: Authors states we have no conflict of interest with the subject matter or materials discussed in this manuscript.

Source of Funding: Ministry of Education, Culture, Research, and Technology of the Republic of Indonesia. Grant Number: 1867/E4/AK.04/2021

Ethical Clearance: Ethics approval for this study was obtained from the Husada Karya Jaya Academy of Nursing Ethics Committee Number: 01/SK-KE/III/2021.

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