

# Development of a Tool as a Learning Support for Understanding Photography Principle

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## Abstract

This research was an applied research carried out in the field of photography. The main aim of this study was to produce a portable box processing unit to support the operation of a photo studio practice using the dry plate photography technology. A portable box processing unit is a must for dry plate photography-based photo studios in order to make it possible to be operated at various places. Dry plate photography technology is one of the 19th century analogue photography technologies that can still be employed today to set self-portrait photography services as a means to create works of art as well as a medium of education and entertainment for the public and the photography community. The method of this applied research covered three steps, namely the literature study, designing process, and evaluation stage. The method was expected to bring solutions so that the dry plate photography as an interesting, unique photography technique from the 19<sup>th</sup> century could be revitalize in the society.

## Keywords

photography, dry plate, photo studio

## Introduction

*Dry plate photography* is one of the photography methods that was invented in 1870 by Richard Leach Maddox [1]. In 1930's, it got its fame and was widely employed by photographers around the world, including Indonesia. Shortly, dry plate photography is photographing method using a camera and a light-sensitive glass medium that is covered with dry emulsion. It is a further development of the wet plate photography method. Nowadays, especially in America and European countries this method is used again in a different context from its early uses in the 19<sup>th</sup> century. In those countries, it is now used to fulfilled needs arouse in art and entertainment domains. This phenomenon has generated economic potentials. Although there is a promising opportunity to develop it in Indonesia, there has not been an effort to do it. It can be said that this research is the first to examine the dry plate photography development.



Picture 1. Dry plate photography practice in 19<sup>th</sup> century [2]  
(<https://monovisions.com/vintage-19th-century-photographers-with-their-cameras/>)

In the former research, the Old Photographic Processes, a Student Activity Unit of ISI Yogyakarta, was successful to re-actualize the dry plate photography process. However, the research findings were not really applicable due to the absence of the Box Processing Unit (BPU) to process the picture. So far, pictures have been processed in a special dark room available in the campus. It set limitations for the society to access the dry plate photography.

A BPU is crucial in order to conduct the dry plate photography outside the campus in a more effortless way because BPU is a portable substitute device for the darkroom. Considering this situation, BPU needs to be realized. This research was focused on the making of PBU to function as a darkroom so that it would be possible to use the dry plate photography at any place and it could be enjoyed by all members of the society.

## Literature Review

There is very little number of research that are carried out to study the analogue photography practices both in and outside Indonesia. Most of the applied research bringing analogue photography as its subject were conducted by individual or not in an institution-affiliated manner. They were conducted informally by individuals or community without involving institution affiliation. The research disseminated the findings of their studies through the internet and social media. Anton Orloy once organized a traveling photography school named Photo Palace Program (<http://thephotopalace.blogspot.com/p/photo-palace-program.html>, n.d.). The Photo Palace Bus Program has been running until today. Through this education program, Orloy modified a used school bus into a space where he carried out instruction on 'classical photography', i.e., the wet plate photography and the daguerreotype).

Orloy's method is very relevant to this applied research, however a difference lies in the material/ yet it is different in the material used. Orloy chose to use a big bus while in this research with device accessibility as the main consideration, we preferred to use a portable box. The reasons for choosing a portable box were the low-budget production, easy maintenance, simple management, and high accessibility in relation to the geographical condition of Indonesia. Apriyanto et.al. [3] conducted applied research relevant to analogue photography under the title *Transparent Afghan Camera: Karya Fotografi Performatif dan Partisipatoris (Transparent Afghan Camera: A Performative and Participatory Works of Photography)* that was published in *Specta: Journal of Photography, Arts, and Media* 2.1 (2018: 13-24).

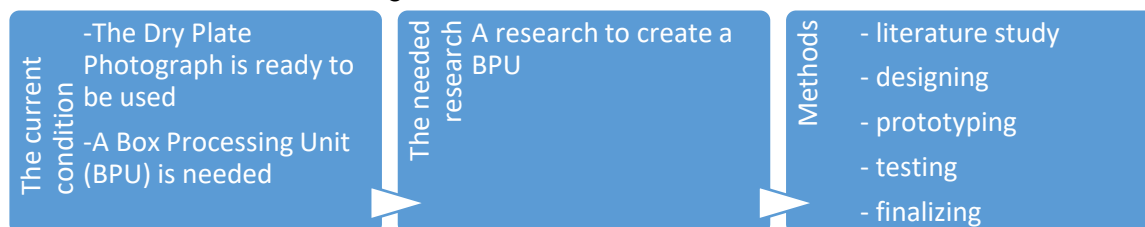
In that research, an afghan box camera was reconstructed to create performative works. The importance of the research was the employment of the black and white reversal technique in order to hasten the photograph processing and could be enjoyed by the audience. In addition to it, the process was also interesting. The afghan box camera today is under the KKM KOPPI management. In 2019, it became a part of ArtJog, an international visual art event in Yogyakarta.

The analogue photography that was set as the major references for this research were the black and white photography and the reversal technique. Suess [4] in his book thoroughly explained the working steps of the black and white analogue photography covering the camera, the light-sensitive materials, the darkroom design, and the works presentation. He presented it using a work scheme. It helped this study by providing a model of how to apply the steps and identify the sources of the possibly arouse technical problems. Anchell [5] also claimed that an ideal darkroom had to fulfill six requirements, as asserted in his statement: "There are six requirements for a darkroom to safely and efficiently process, proof, and print negatives: 1) A source of water; 2) A light tight environment; 3) Proper ventilation; 4) A dust-free environment for film drying; 5) Electricity; and 6). Adequate space." These principles were applied in creating the BPU with several modifications.

## RESEARCH METHODOLOGY

To design the BPU, there were some stages to be undertaken: (1) literature study; (2) designing, (3) prototyping; (4) testing; and (5) finalizing. A literature study was carried out to identify crucial principles in dry plate photography processing. The gained knowledge would be used to base an effective, efficient, and right design process. Adequate insights on dry plate photography served as the foundation in the PBU technical drawing stage. This phase would result in the most suitable material and convenient form of the BPU. Next, the prototype would be produced, tested, and evaluated. The result of the evaluation would be based on the final design.

The KKM KOPPI and our former study had succeeded in re-actualizing the dry plate photography in terms of preparing the materials and photographing. However, the picture-printing process had not been the focus of our attention. There was an urgent need to create a BPU to support the dry plate photography development. In this research context, the work scheme would be the following:



Picture 1. Current condition and research plan

The coming pictures depict the previous achievements relates to this research context.



Picture 2. Dry plate photography that needs a BPU



Picture 3. A BPU used in the past, around 1861-1865 [6]

<https://onphotography.me/2016/12/22/mathew-brady-the-original-war-photographer/>

## FINDINGS AND DISCUSSION

The making of a BPU was conducted following the plan illustrated in the research method section. The main considerations used in designing it were: accuracy, efficacy, and efficiency. So as to recognize substantial standards, a careful literature study on how the dry plate photography worked was executed. Having gathered the needed information, the study was continued by having the next steps: (1) designing; (2) prototyping; (3) testing; and finalizing. The BPU working drawing was made after we got sufficient knowledge about the dry plate photography process.

### 1. Designing and Prototyping

This phase was aimed at creating the most convenient and ergonomic BPU. We decided to design a square BPU to get spacious room to place all devices and materials inside. Visually, square form would provide an impression of solidness and would function as the visitors' eyes catcher when it was operated in public spaces. A bright color and mahogany motifs were chosen and were also expected to be a point of interest because of the resulted antique, artistic, and natural effects.

Its strength, easiness to work on, comfort, and long lastingness of the designed BPU were the most considered factors. Based on those concerns, a decision was made to use mahogany for its strength and durability. In addition to it, mahogany had the required density. It was not too heavy so that it was easy to be moved and carried. However, it was strong enough to endure the wind and sunlight exposure.

Wood was selected to be the material because the top of the BPU would be covered with acrylic sheet. Acrylic could be installed sturdily with wood as the base.

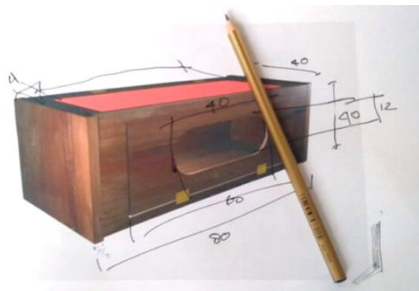
The next phase was designing the BPU by sketching it based on the function it would hold. The followings were the deliberations:

a. Function

The BPU to be functioning was the major concern so that the design process was focused on the efforts to fulfill the requirements of an ideal darkroom for the dry plate photography. The main condition a dark room should fulfill was that it must be impermeable to light spectrum except red spectrum. Consequently, the BPU must be designed impermeable to light too. In order that the photography process running inside the BPU could be observed by people outside it, the observation window was made of red acrylic.

b. Operational Convenience

The operational convenience was in terms of how the BPU operator's hands could freely enter the BPU and conduct some steps of photograph processing. Hence there were two factors should be thought about, i.e. the size of the hand hole and light antidote material to prevent the light from entering the BPU. The solutions for those problems were to design the hand hole as big as the normal people's hand size and to set enough space for the hand movement. For the light penetration problem, a hand-shaped lightproof black cloth completed with rubber at the fingertips was the solution. The design is illustrated by the pictures below:



Picture 4. BPU design



Picture 5. BPU from side-front angle.



Picture 6. BPU with the doors opened.



Picture 7. An opened BPU with its utilization



## 2. Testing and Evaluation

At the testing stage, there were two aspects that should be examined: the function and the convenience. The function aspect referred to the stage where the BPU could function well in achieving the targeted results. In detail, it could be utilized in processing and producing photographs as the ones desired and there was no light leak. Hereinafter, it will be explained the BPU testing done outdoor.



Picture 8. Outdoor BPU testing



Picture 9. Operating the BPU



Picture 10. Operating the BPU after photographing stage.



Picture 11. Photograph development process in the BPU could be observed from outside.



Picture 12. The testing results of BPU indoor use, the picture looks normal (left) and outdoor use, picture cannot be seen (right).

The BPU testing done outdoor and indoor shows results as follows. The testing done indoor resulted in the desired results, meaning the images projected from the picture taking stage could be printed well. Otherwise, the ones done outdoor were not successfully produced. There was excessive light exposure in the BPU. Two possible reasons for this result were: first, the red acrylic area was too wide and too long light exposure so that the red light enter the BPU overly, exceeding the maximal amount that could be tolerated by the photo papers. The second factor was because the entering light was reflected back due to the interior wall of the BPU that was painted with light tone color.

From the evaluation stage, we learned that there were some further steps that should be organized.

- a. Covering the acrylic area with a piece of cloth when the BPU was used outdoor

Disclosing the acrylic area could be done because logically it would prevent the light from touching the photo papers. The possible material to cover was cloth. It was a proper material due to its flexibility that was needed to ensure the BPU operator and also the visitors could inspect the process happened behind the cloth.

- b. Adding more layers to the red acrylic

Adding the acrylic layer logically would reduce the non-red-light spectrums to enter the BPU. However, there was only a small success probability due to the strong radiation exposure from the sunlight.

- c. Adding a dark film glass to the acrylic

By attaching a dark film glass to the acrylic sheet, the non-red spectrum lights entering the BPU would decrease. However, this method would influence the visibility of the observed object in the BPU. Of course, it would limit the chance for the visitor to get the education and entertainment that obviously was the objective of this research.

- d. Painting the BPU interior wall black

Painting the BPU black could reduce the light reflection. However, as also explained in point c, this way would limit the audiences from seeing the process happening in the BPU clearly.

- e. Operating the BPU in an indirect light exposure

Operating the BPU with indirect light might be an alternative to lessen the amount of light that hits the BPU. It might be the solution to keep the BPU to be functional and at the same time to ensure the achievement of the research's goal that was to provide the public with an opportunity to witness a photograph film soaking and printing.

Another benefit gained from this arrangement was that the visitors would feel comfortable since they did not have to watch the process under the sunlight.

Grounded on the formerly elaborated points and considerations, the first point of evaluation was that the acrylic area of the BPU needed to be upgraded to promote its function by attaching one more layer above the acrylic.

The second point was on its convenience aspect. Generally, it can be said that at the first testing, the BPU was comfortable enough to be operated and fitted with the projection of the early stage of the research. The BPU operators could operate the device smoothly and comfortably because it had enough space enabling them to move their hands freely. In terms of

comfort, to optimize the BPU performance, a strong table where the BPU could be placed on was a promising possibility.

### 3. Finalization

After several experimentations, it was found out that to guarantee that the BPU would function optimally as an education and entertainment medium, we decided to operate the BPU under indirect light exposure. Below is the illustration of the final version of how the BPU would be operated.



Picture 13. The BPU was operated under an indirect light exposure.



Picture 14. The BPU was operated at a terrace and the picture resulted.

## CONCLUSION

The designing and testing processes of the BPU came to these conclusions: (1) the resulted design of the BPU could be operated conveniently and it could be proven by the fact that the operator did not find any significant difficulty. At the visitors' side, acrylic area could provide them with an opportunity to get education about photograph processing and also entertainment; (2) BPU could be optimally operated at places with indirect light exposure, for instance terrace or indoor spaces. At these places, there was only minimal sunlight so that the acrylic could prevent all light spectrums except the red one.



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## Biographies



**Muhammad Fajar Apriyanto, M.Sn.**

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Fajar Apriyanto, a man from Solo, was introduced to the world of photography during his junior high school years in his hometown. After completing his high school education, he moved to Yogyakarta and pursued a degree in Visual Communication Design at the Modern School of Design Yogyakarta (1995). In this program, he delved deeper into the world of cameras for a year. His commitment to photography was evident when he enrolled in the photography department of the Faculty of Media Arts Recording, ISI Yogyakarta (1996) during his undergraduate studies. As a student, he specialized in commercial photography. His dedication to photography led him to become a teaching staff member in the Photography Department at FSMR, ISI Yogyakarta. He furthered his studies in the Creation Program at the Postgraduate level at ISI

Yogyakarta (2008). Currently, he is completing his doctoral studies at the same institution (2020).

He is active as a speaker in seminars/workshops, a judge in photography competitions, a researcher, and a lecturer at various institutions including UGM in the Faculty of Medicine, Public Health, and Nursing, Department of Health Policy and Management, the "MMTC Yogyakarta" School of Multimedia, and the Modern School of Design Yogyakarta. He had the opportunity to serve as the head of the photography department from 2008 to 2012 and as the Assistant Dean for Student Affairs from 2016 to 2020. He has a strong interest in organizational activities both within and outside of the campus. He has visited several countries for cultural missions and exhibitions, including Portugal, Spain, Thailand, Cambodia, Beijing, Singapore, Malaysia, and Australia. In addition, he is a practitioner in the field of commercial photography, especially in creating company profiles for businesses.



**Dr. Irwandi, M.Sn.**

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Irwandi began his journey in photography in 1997 while pursuing his education at the Modern School of Design Yogyakarta. In 1998, he continued his photographic studies in the Photography Department at FSMR, Indonesia Institute of the Arts (ISI) Yogyakarta, and earned his Bachelor of Arts degree in 2003. Just three months after graduating, he dedicated himself to his alma mater as a teaching staff member in the Photography Department. In addition to active teaching and exhibiting, he ventured into the realm of old print in 2005. Since then, he has frequently served as a resource person for various old print workshops in different student activity units. His research results in 2009 were published in the form of a book titled "Old Print:

Photography Works Towards the Creative Economy." Furthermore, in 2012, he also published a photography book titled "Reading Portrait Photography: Theory, Discourse, and Practice."

In 2008, he earned a Master of Arts degree in the field of photographic studies from ISI Yogyakarta with a thesis titled "Portrait Photos by Kassian Cephas: Aesthetic, Meaning, and Social Function Analysis." His most recent education was completed in the Doctoral Program of the Faculty of Multidisciplinary Studies, Performing Arts, and Fine Arts Studies Program at the Graduate School of Gadjah Mada University (UGM) Yogyakarta, with a dissertation titled "The Rhetoric of Adolescent Girl Photography and Portrait Studio Practices in Yogyakarta," graduating in 2016. Currently, he remains active in participating in various photography exhibitions, conducting photography research, curating photography exhibitions, and writing articles for scholarly journals. Some of his notable achievements include winning an honorable mention in the FKY Photo Contest in 1997, receiving a Bronze Medal at the Salon Foto Indonesia (SFI) in 1999, and earning an award in the Monochrome Print category at SFI 2000, among other nominations and accolades. In 2019, he studied carbon transfer, liquid emulsion, and wet collodion printing techniques at Gold Street Studio in Australia through a collaboration between D'Arno Gallery and the Photography Department at FSMR ISI Yogyakarta. In 2020, he was appointed as the Dean of the Faculty of Media Arts Recording at ISI Yogyakarta.



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Michael Steve J.S., commonly known as Steve, is a man from Bandung and a freelance photographer based in Yogyakarta, while pursuing his studies in the field of photography at the Indonesian Institute of the Arts Yogyakarta. On the other hand, his photography specialization includes editorial photography and alternative photographic processes. In Yogyakarta, he is quite active as a speaker and conducts workshop classes in the field of alternative photographic processes, especially cyanotype and salt print.

Between 2018 and 2023, he has been actively exhibiting his work in Yogyakarta and Bali, including participation in events like the Solo Photo Festival (2019), Bandung Photo Month (2022), and TKMFI (2023) held at ISI Denpasar. In addition to exhibitions, he has worked as a freelance photographer specializing in concert photography since 2016 to the present. He has served as the official photographer for Toba Audax (2017), documented events such as WE THE FEST (2019), IDCC (2019), and Keroncong Plesiran Vol 6 (2022).

From 2020 to the present, he has also been active as a speaker on alternative photographic processes and has conducted workshop classes, including the Cyanogram Split Toning Museum and Clay workshop (2021), Hand Made Photography at Gama Creative Hub (2022), and Salt Print Fotkom401 (2022).