



Available online at **FACTUM**; Jurnal Sejarah dan Pendidikan Sejarah
website: <https://ejournal.upi.edu/index.php/Factum>
FACTUM: Jurnal Sejarah dan Pendidikan Sejarah, 9 (1). 2020. 39-50

RESEARCH ARTICLE

**MODEL OF HISTORY EDUCATION LABORATORY
MANAGEMENT (EXPLORATION STUDY OF LABORATORY
MANAGEMENT FROM ORGANIZATIONAL AND
ADMINISTRATIVE ASPECTS)**

Oleh:
Tarunasena, Ayi Budi Santosa, Iing Yulianti¹

Naskah diterima : 6 Desember 2019, **Naskah direvisi** : 28 Februari 2020, **Naskah disetujui** : 20 Maret 2020

To cite this article: Tarunasena., Sanosa, A.B., & Yulianti, I. (2020). Model of history education laboratory management (exploration study of laboratory management from organizational and administrative aspects). *FACTUM: Jurnal Pendidik dan Peneliti Sejarah*, 3 (1). 2019. 39-50, DOI: <https://doi.org/10.17509/factum.v9i1.21693>

ABSTRACT

The background of this research is based on the importance of forming professional history teacher candidates following the above-mentioned expectations, the Department of Historical Education needs to empower and develop the History Laboratory as a superior program. The History Education Laboratory is centered on the field of science, a place of authority and academic integrity. The History Education Laboratory was formed to meet the needs of the department and the development of academics. The main limitation of this research problem is "what is the model of Management of Historical Education Laboratory in Higher Education from the Organization and Administration aspects? Qualitative research methods are research procedures that produce descriptive data in the form of written or oral words from and observable behavior. The objective of the researcher to use a qualitative approach is to look for a complex and holistic description of the subject matter studied in this regard regarding the management model of the Historical Education laboratory in tertiary institutions.

Keywords: 21st century, historical education laboratory

¹Tarunasena, Ayi Budi Santosa, dan Iing Yulianti adalah dosen Departemen Pendidikan Sejarah FPIPS UPI. Penulis dapat dihubungi di *email* : tarunasena@upi.edu

PENDAHULUAN

The success of a teaching-learning process is greatly influenced by one's interests and talents. One effort to develop an interest in learning is how the learning process can be presented attractively. Interest and attention are two things that affect the success of teachers and students in teaching and learning activities. Interest and attention are closely related to one's feelings and those feelings are contagious. If a teacher takes an interest in the material taught, then the teacher will carry out the profession with enthusiasm and students will respond well. These conditions will create a fun learning process and can achieve the expected learning goals.

History learning material teaches many stories of the past, when events occurred and who did it. If the material is not well packaged, it can become a saturating subject. Especially if the learning process is not supported by professional teachers and do not have interest or attention in teaching subject matter to students. But instead, the subject of history has the potential to be taught in interestingly and enjoyably if a history teacher meets the criteria of a professional teacher, skilled, and animate the material being taught.

Professional teachers are not only good at mastering theories of teaching and learning and mastery of teaching materials. Teachers are also required to have skills and art in teaching historical subject matter. One of the arts of teaching is to have the power of imagination and inspiration for the material taught. Imagination and sentiment will be increasingly helped if there are learning media that support the problem being taught to students.

To form a professional history teacher candidate following the above

expectations, the Department of Historical Education needs to empower and develop the History Laboratory as the Department's flagship program. This laboratory can be developed for the collection of historical source materials, such as exhibits of objects, images, and photographs. Historical laboratories can also be used as research centers or research for lecturers and students. Recreation can also be a function of the development of historical laboratories. Therefore, the historical laboratory is expected to be a study material for academics, both lecturers and students. Even if necessary, lectures can be held in the laboratory room so that learning will be much more alive.

Why does the Department of Historical Education need to develop a History Laboratory? As explained earlier, historical learning material is generally memorized and filled with imaginative material, because it discusses the past that has already happened, not experienced and witnessed by students or students. Not surprisingly, learning history is only considered a fairy tale, far from reality, very difficult to memorize, and ultimately boring. For this reason, to bring historical material closer to the object of events, this year the Department of Historical Education programmed laboratory management from the organizational and administrative aspects.

Laboratory (abbreviated as a lab) is a place of scientific research, experimentation, or scientific training. Laboratories are usually created to allow these activities to be carried out in a controlled manner. The Historical Education Laboratory is a place for teaching and learning and the practice of historical research; a place for providing information about historical sources both for students and teachers; a place to in-

crease teaching materials such as the publication of textbooks, scientific journals, and research reports which are equipped with discussion activities. All activities in this laboratory aim to support student lectures and teacher research. To improve the competitiveness of students at the University, this laboratory is a very significant place in simulating the ability of a theory to be practical through intense practicums.

Thus it is hoped that the Historical Education Laboratory would become a center of scientific knowledge, a place of authority and academic integrity. The History Education Laboratory was formed to meet the needs of the department and the development of academics. The History Laboratory is a place for teaching and learning of Historical methods courses and historical research practices; a place for providing information about historical sources both for students and teachers; a place to increase teaching materials such as the publication of textbooks, scientific journals, and research reports which are equipped with discussion activities. All activities in this laboratory aim to support student lectures and teacher research.

The main limitation of this research problem is “what is the model of Management of Historical Education Laboratory in Higher Education from the Organization and Administration aspects?: Based on that problem, then made some research questions which is:

1. What is the model of managing historical education laboratories from the organizational and administrative aspects of overseas education campuses?
2. What is the management model of historical education laboratories from the organizational and administrative

aspects of education campuses in the country?

3. How is the implementation of the management of historical education laboratories of educational campuses at home and abroad in the History Department?

LITERATURE REVIEW

Laboratory Conditions

The following is a list of laboratory equipment found at the Historical Education Laboratory.

Tabel 5.1 Laboratory Equipment

For a clearer list of equipment in

No.	Tool Name	Number of Tools
1	Laboratory head room	1
2	Laboratory secretary room	1
3	Historia journal room	1
4	Seats	35
5	Tables	40
6	Computers	4
7	Printer	3
8	Smart board	1
9	Bookcases	6
10	Wardrobe space	3
11	Map table	1

the enclosed space in photographs and films (DVD). Responsible for managing and implementing Laboratories and IT Departments. Responsible for conducting laboratory activities and IT Departments in accordance with the vision, mission and goals of the institution. The authority to manage the History Education Lab includes:

- a. Manage laboratories in accordance with the academic objectives of the Department.
- b. Providing services for laboratory users

- and the academic community of the Department.
- c. Maintain, improve, develop tools and media in the laboratory according to the needs of the Department.
 - d. Collaborating with other agencies in the framework of developing the Department's laboratory and network.
 - e. Create and up dating the Department of History Education website.
 - f. Facilitating e-learning programs and learning media.

Teachers in the field at a certain activity and at certain times often ask whether the Department of Historical Education has learning media in the form of documentary films, both national and international. The films are needed in order to attract students' interest in learning history, eliminate verbalism, bring the material closer to the object, and add insight into teacher and student knowledge. Thus, the Program for the Development of Historical Laboratories for Organizational and Administrative aspects through Documentary Film Documentation is highly anticipated and needed by the world of education, especially history and social studies teachers in schools and colleges.

History Laboratory Development Program Through the search for management models from the aspects of Organization and Administration as well as documentation of Documentary Films felt necessary by the Department of History Education of FPIPS Universitas Pendidikan Indonesia because it has been assessed based on SWOT analysis (Strength, Weakness, Opportunity, and Threat), namely as follows.

First, strength in Department of History

Education are have a history laboratory, has experts in the fields of history and history education, has supporting facilities and infrastructure such as computers, LCDs, camcorders, digital cameras, and computer technicians for making documentary films.

Second, weakness which is a weakness of the Department of History Education for this program include:

- a. the use of existing historical laboratories has not been utilized optimally
- b. there is a lack of collections of history learning materials in the history laboratory
- c. documentary films that tell a variety of historical events have not been widely owned by the Department of Historical Education
- d. practicum activities and student field work lectures to various historical heritage sites that are held every semester have not been documented results in a documentary film, even though the results of the visit can be a learning medium needed by teachers / prospective teachers.

Third, opportunities owned by the Department of Historical Education for this program are as follows:

- a. Every semester and every year students of the Department of Historical Education hold practicum activities and Field Work Lectures (KKL) to various historical objects or sites in Java and Bali.
- b. Many historical heritage objects which represent the era of historical propagation are scattered in various regions in Indonesia.
- c. The Ministry of Education often uses the National Archives as a research

center so that it can be traced to the existence of documentary films owned by the National Archives.

- d. The Department of Historical Education has alumni of history teachers in various regions in Indonesia who are in dire need of documentary films to support the media of learning history in schools.

Fourth, threat in laboratory development activities through documenting and making historical films, such as:

- a. no permission to copy, buy, or reproduce documentaries owned by the National Archives and historical objects or sites.
- b. It is feared that there will be damage to facilities and infrastructure in making documentary films
- c. Delete or lose files by computer virus

Based on the SWOT analysis, a laboratory management model is needed from the aspects of Organization and Administration to support the process of learning history in schools and the Department of Historical Education. which can raise the image of the Universitas Pendidikan Indonesia, especially in education way.

National Education Policy and Laboratory

National Education System Law No. 20 of 2003 Chapter XII Article 45 mandates the need to provide educational facilities and infrastructure. Each formal and non-formal education unit provides facilities and infrastructure that meet educational needs in accordance with the growth and development of the physical, intellectual, social, emotional, and psychological

potential of students. Government Regulation No.19 of 2005 concerning National Education Standards in article 1 paragraph 8 among others, stating that the minimum criteria regarding learning spaces, ... laboratories, ... are needed to support the learning process, whereas article 42 requires that every educational unit must have facilities which include furniture, educational equipment, educational media, books and other learning resources, consumables , as well as other equipment, and are also required to have infrastructure that includes land, classrooms, laboratory rooms, and other spaces / places needed to support an organized and continuous learning process.

In general in Indonesia, the image of learning laboratories at the elementary, secondary and tertiary levels of education has always been synonymous with natural studies and studies such as biology, chemistry, physics, languages and finally computers. Of course the image is not wrong considering that in the Republic of Indonesia Minister of Education Regulation No. 24 of 2007 concerning the standards for Facilities and Infrastructure it is clearly stated explicitly that the minimum requirements for schools must include biology laboratories, physics laboratories, chemical laboratories, computer laboratories, and language laboratories. Likewise in higher education, laboratories are identical with the study of these sciences and vocational engineering study programs with all their applications. But along with the development of theories and thinking in a progressive-constructiveistic education, supported by the strengthening role of the study of social sciences, including science education

social knowledge, the need to have a social science laboratory is increasing.

The character of social science is different from natural science, and this also certainly affects the laboratory model it develops. So that the characteristics of the social studies laboratory have some differences with the science laboratory. Even so, the functions, benefits and allotment are more in common. experiments such as the Natural Science laboratory. Nevertheless in the Social Sciences laboratory it can be equipped with two or three dimensional teaching aids for social studies teaching.

According to the Regulation of the Minister of Research, Technology and Higher Education of the Republic of Indonesia Number 44 of 2015 concerning National Standards for Higher Education Article 33, universities must provide facilities and infrastructure to meet educational needs in accordance with the talents, interests, potential, and intelligence of students. Learning resources must also be provided, facilitated, or owned by Universities in accordance with the Study Program developed, and can be used jointly by several Universities. Laboratory facilities, libraries, computing, information technology in tertiary institutions are facilities that are the minimum requirements for conducting education, research, and community service activities in accordance with the levels and educational channels.

Thus it is clear that the existence of the laboratory is very important because its function and benefits as a means of supporting majors / study programs in the field of education and teaching are used directly in the teaching and learning process so that learning objectives are

achieved, applied research, and community service.

Management of the Historical Education Laboratory

The History Education Laboratory aims to facilitate activities with lecturers and students in the context of historical work practices which are specifically concentrated on historical research and the development of historical learning media. This laboratory activity is carried out in an integrated manner between heuristic and analytic activities on various community events, both at the local, regional and international levels. The results of this activity can later be accessed for research purposes. Besides that, other activities that have been and will be developed include:

- a. The publication of history books, history education, and others that are relevant to scientific education and history
- b. Documenting documentary films through the collection and making of documentary films (in the flagship History Education program funded by DIPA UPI in fiscal year 2008, the History Laboratory succeeded in (a) collecting documentary films in audio-visual form on various historical events, both in Indonesia and outside Indonesia in accordance with the time of the breaking down of history which is packaged in the form of digital data (VCD or DVD) which is expected to be a source of learning history, both in Higher Education and Middle / High Schools (Middle School / High School) and (b) Making a minimum a documentary film about one of the historical heritage sites in Central Java in the form of audio-visual which is

- packaged in the form of digital data (VCD or DVD).
- c. Student skills training, especially in the development of Life Skills in making Replica items of historical heritage (2009 History Education flagship program)
 - d. Teaching practice for students before attending the Field Experience Practice (PPL). This lab can be used as Micro Teaching. (For this activity in the future the Laboratory can also be designed as a mini micro teaching)
 - e. Development of student practicum
 - f. Other activities related to historical research

Discovery Learning and project learning (inquiry) are learning models that require laboratories. These two learning models have gained a major place in Indonesia especially in the 2013 Curriculum. The emergence of these learning models in the 1960s and 1970s actually relates to the development of natural science curriculum. The thought of Jerome Bruner, a cognitive psychologist from the university around 1959, inspired the curriculum innovators of natural science courses who believed that basically children have potential.

The ability to solve problems, interests and natural motivation to learn knowledge about the world they see (Bruner, 1960). Therefore children should not be left isolated from facts, but rather they must be guided to find the structure, or concepts and theories that become pillar of a science and knowledge. They must be given the opportunity to have experience in the form of learning activities to recognize the structure of science accompanied by the introduction of the physical structure (real objects) of a phenomenon in the

laboratory (Mattews, 1994). Since then scientists continue to try to interpret and interpret Bruner's thoughts so that learning activities in laboratories can be accepted by various groups both in the university environment through theoretical-empirical research and praxis from teachers in learning in schools. Even according to Rudolph (2003), the birth of the inquiry approach in learning is nothing more than an expansion of the meaning of experiential learning (laboratory). The assumption that the learning experience in the laboratory helps students understand the material, phenomena, concepts, models and interrelationships, is increasingly accepted and continues (extends) to be examined and proven.

Based on these thoughts, an understanding is obtained that a laboratory can be interpreted as an institution and a place, both in door and out door that function to carry out the activities of investigating, testing, experimenting, training equipped with certain equipment. From that also obtained the meaning that the learning laboratory is a place of learning with methods of experience (practice) observation and discovery that is not limited in the classroom but also outside the classroom such as gardens, markets, settlements, settlements, indigenous communities, watersheds, forests, and others where there is community activity.

RESEARCH METHODS

This study uses a qualitative approach, which starts with data and leads to conclusions. Qualitative research methods are research procedures that produce descriptive data in the form of written or oral words from and observable behavior. The objective of the researcher to use

a qualitative approach is to look for a complex and holistic description of the subject matter studied in this regard regarding the management model of the Historical Education laboratory in tertiary institutions.

Documentation of documentary films that contain historical events in human life is very unlimited, for this it is likely that not all historical objects can be documented. Thus in the coming years documentary film commentaries, both through purchase and self-production, will continue to be followed up so that the historical laboratory owned by the Department of Historical Education is felt adequate, at least there is for every historical breakdown. The films that are owned can later be used as learning media, both in lectures and in the teaching-learning process in the classroom. The impact of this program is expected to improve the quality of teaching and learning of teachers and lecturers.

The activity of developing the historical laboratory of the Department of History through documenting documentary films will involve several participants, including several lecturers, students, and site officers visited. UPI FPIPS History Education Lecturers involved were lecturers who were experts in the fields of historical science and PBM History. They are also expected to be able to provide a concept of directing the film to be documented. While the students involved are those who master the film design and editing program. While location officers are required to accompany historical objects and resource persons for the provision of documented historical objects.

DISCUSSION

On the first day of the workshop, participants were given a presentation by the Eye History Society of Semarang State University. The material presented discusses the graphic info design, types of films, and the overall filmmaking process. On the sidelines of the presentation there was also a discussion process between the participants and the presenters regarding the material presented. The material presented is very interesting. The Eye History Community of the Semarang State University already has very far progress in the development of ICT-based learning media in collaboration with the Laboratory of History Study Program in Semarang State University. Owned devices are already very capable to be able to carry out the production process both video and infographic. After the presentation, participants were also asked to make a synopsis of the documentary film individually as a preliminary exercise and preliminary overview before trying to carry out the video production stage. Then we were asked to be able to produce a product in the form of a documentary video that would be assigned through several groups.

After that, participants were grouped into three large groups. The three groups were assigned to make a documentary. For Group 1, assigned to make a documentary film about the Indonesia Sues Building. Group 2, assigned to make a documentary about life style. So, Purnama Coffee Shop was chosen as a place for making films. While Group 3, was assigned to make a documentary film about the video profile of the Isola Building in Universitas Pendidikan Indonesia.

After the place is chosen, then the

structure is arranged in producing this profile video for each member as follows:

GROUP 1: INDONESIA BUILDING SITES

- a. Director: Awaludien (1807325)
- b. Cameraman Team: Naufal F. (1801510), Ghifari Rahman (1803671), Siti Julaiha (1701277), Dewi Sella (1806576), Azzura Firdaus (1808089).
- c. The Script Writer Team: Widi Hadistiani (1703613), Firda Tri U. (1704226), Tia Oktarina (1700842), Ghina Fauziyah (1704580), Hefilda Dwi B. (1705753), Yuli Yulianti (1703730), Faidah Amany (1600695)
- d. Research Timi: Farhan Setiawan (1701804), Maulida Indah P. (1704731), Aditya Rachman (1702212), Widiyanti (1805412)
- e. Dubber: Viola Amelianda P. (1701241)
- f. Editor: Erna Sari (1801608), Ahmad Fajri P. (1704230), Alissa Pujiyanti (1700089)

GROUP 2: PURNAMA COFFEE SHOP

- a. Director: Andika Fibio (1807937)
- b. Research Team: Annida Azizah N. (1700466), Zalfa Rizka S. (1800159), Elvira Damayanti D. (1801309), and Irma Siti N. (1703913).
- c. Manuscript Team: Muhammad Miqdad R. (1702089) and Widiyanti (1703921).
- d. Cameramen: Lulu Nurjamil (1601985), Vivi Yana F. (1700796), Siti Nurmila (1701236), Syifa Senja S. (1702496), Rachmat Hidayatullah (1701979), Hanna (1705872), and Isra Diana (1805984).
- e. Talents and Dubber: Dania Shinta (1706076) and Pikri Ahmad Sidiq (1703324).
- f. Editor: Muhammad Rafly (1808182),

Belva Priyatama (1807682), Toriszha Sudrajat (1705602), Vira Anindhita W. (1803961), Vebyanti Az'zahra (1801930), Selly Ayu R. (1703955).

GROUP 3: ISOLA BUILDING

- a. Producer: M Farhan Chohan (NIM 1706082)
- b. Director Team: Shanti Fatiarif Z A (1703740), Amor Patria (1703142),
- c. Endah Febriyanti (1701699), Rama Ramadhan (1705720), Desy Maulidiyani (1700717), Angga Arya P H (1806238), Iis Leni (1804870)
- d. Cameraman Team: Tamara Dewi R (1701052), Putri Rahayu G (1703058),
- e. Iqromatunnisa (1700890), Nur Insani M (1701657), Iis Ristikasari (1806215), Ferry Rachmat S (1807807), M Refi Omar Ar Razy (1700105)
- f. The Script Writer Team: Dian Nuraeni (1706055), Belinda Ismarini (1705717),
- g. Cahya Wulandari (1808107), Fajri Nuur L (1801627)
- h. Dubber: Hanafianzya Nur D (1704051)
- i. Editor: Nadi Naufal M (1701656)

On second day of the workshop, all participant producing a documentary films.

GROUP 1: INDONESIA BUILDING SITES

All members of Group 1 carried out the production stage of documentary filmmaking which took place at the Indonesian Sues Building Jl. Pioneer of Independence No. 5 City of Bandung. Group 1 was accompanied by Mas Taufiq from Semarang State University History Eye. In this production phase, photographs, videos and interviews were conducted at the Indonesian Defendant building, Mr. Salim as an officer. Group 1 was given guidance on how to use the camera for

video shooting, video recording angles in shooting, using a tripod, camera settings, public speaking, and plotting models.

After Ishoma, Group 1 conducted a presentation on the editing process in the Front Lobby of the National Education Museum as a provision in the video editing stage after the video production process was carried out.

GROUP 2: PURNAMA COFFEE SHOP

On the second day, all members of Group 2 made the process of making a documentary film which took place at Warung Kopi Purama Jl. Alkateri no. 22 KotaBandung. Group 2 was accompanied by Mas Juna and Mas Muif from the Eye History of Semarang State University. We were given directions for the use of cameras, the use of dreadlocks, camera shooting angles, camera motion, public speaking, to plotting models. Because our group takes the theme of lifestyle, the content and language we convey is not too formal so that it can be understood by many people. The models that play a role in presenting food and drinks at the Warung Purnama Coffee Shop are Pikri and Dania.

After completion, Group 2 headed to the Indonesian University of Education Campus to have lunch. On the second day the material for the documentary was immediately processed in the editing stage. In the editing process we consulted with Mas Juna. We discuss the selection of songs that are suitable for our videos, then the video transitions, video effects, and so on. We were constrained about a laptop for video editing and in the end we lent a laptop by Mas Juna for the editing process. We were constrained because our video editing file was not saved on the laptop and was deleted. Until finally we repeat part of our editing process and our video can be

finished.

GROUP 3: ISOLA BUILDING

The second day of the workshop, all members of Group 3 carried out the stage of producing documentary filmmaking at the Isola Building, Universitas Pendidikan Indonesia. Group 3 was accompanied by Mas Irfan and Mas Ghani from the Eye of the Semarang State University community. In this production phase, a number of photos, videos and voice actors were taken. Group 3 was guided by Mas Irfan and Mas Ghany for shooting techniques such as how to set ISO, Shutter Speed, Diaphragm, shooting angle, motion in shooting, how to hold the camera properly, then learn how to operate the drone for shooting, to consultations the results of taking pictures are associated with the video editing process.

After completion, Group 3 headed to the Shell Dome located next to the National Education Museum, Universitas Pendidikan Indonesia to hold lunch. After finishing the Break, Praying and Eating, continued with the presentation of the editing process in the Front Lobby of the National Education Museum. After receiving the presentation, group 3 conducted a video editing process that had passed the production stage.

In this editing phase we consulted about video editing applications such as Adobe Premiere Pro, Adobe After Effects, Adobe Audition, to consultations on effects, transitions, synchronizing between videos, dubbing and songs, tips and tricks in video editing, and color grading to provide more vibrant color hues in the video. After the editing process is complete, the video is exported into the full mp4 video to be presented the next day.

The obstacle that we feel as a whole in

the process of production and editing as a whole is the lack of quantity of devices that we use. In our group there are 22 members, while the device only has 1 DSLR camera, and 1 Drone. So not everyone has the opportunity to try to learn to use a camera or drone in the production process this time. In the editing stage we also had difficulty because our laptop specifications were not qualified enough to carry out the editing process which is very complex and requires high laptop / computer specifications. But with all the limitations, we were able to complete a documentary video about Villa Isola.

On the third day, the agenda was to show the video that had been made, besides that the video was reviewed and evaluated and then given overall suggestions and input for the process of making videos in the future, the final results of the documentary film from each group were held at the National Education Museum. Suggestions and criticisms of the results of the documentary film were given by Mr. Syaeful, Mas Taufiq, as well as representatives from the Department of History Education of the Indonesian University of Education. The workshop was officially concluded on this third day and closed with a group photo.

CONCLUSION

Learning laboratories in tertiary institutions have the following characteristics:

- a. Typically opened during lecture days, but in certain cases can also be opened as needed both before and after lecture.
- b. Open to all students who need additional assistance in learning certain topics or need help solving problems in working

on a project / assignment.

- c. Supported by a trained and dedicated manager, staff or technical staff, usually led by a lecturer with the additional task of being assisted by technical and laboratory assistants.
- d. Students will get special time in certain disciplines or intensive academic assistance in training related tasks with the aim of helping them work together with colleagues or in the interests of achieving certain goals.
- e. In some campuses they are part of the choice of activities, but some also place activities in the laboratory as an integrated part of the lecture program.

Assesing from the character, the learning laboratory should be a room or place that is relatively large, flexible and contains the tools or lecture tools needed in learning with various approaches, such as small group collaboration learning, presentations, debates, writing, and web teleconferencing. The latter activity illustrates that in the ICT era, as pointed out by Scott Metzger, the learning laboratory provides sufficient space for students to learn virtually about various activities and assignments through equipment with the latest technology.

Laboratories in tertiary institutions generally include type II, III to IV. Type II Laboratories are basic science laboratories at the preparatory level (Semesters I, II), or technical implementing units that conduct education and / or training with category II equipment supporting facilities, and managed materials are general category materials to serve student education activities. Whereas Type III laboratories are scientific fields laboratories located

in departments or study programs, or technical implementing units that carry out education and / or training with equipment supporting facilities of categories I, II, and III, and the materials managed are general and special category materials to serve educational activities, and research of students and lecturers. Type IV laboratories are integrated laboratories located in the study centers of faculties or universities, or technical implementing units that carry out education and / or training with equipment supporting facilities of categories I, II, and III, and materials managed are general and special category materials to serve research activities, and community service, students and the public

REFERENCES

- Emda, A. (2014). Laboratorium sebagai sarana pembelajaran kimia dalam meningkatkan pengetahuan dan ketrampilan kerja ilmiah. *Lantanida Journal*, Vol. 2 No. 2, 2014
- Fatchiyah. (2010). *Seluk beluk pranata laboratorium pendidikan perguruan tinggi*. (online) dapat diunduh di fatchiyah.lecture.ub.ac.id/.../seluk-beluk-pranata-laboratorium-pendidikan-perguruan.pendidikan-perguruan.
- Felicia West and Thomas, G.,JR. (1973). *A major role for laboratory schools. educational leadership*. Washington : Asociation for Supervision and Curriculum Development
- Hikmah, N, Saridewi, Agung. (2017). Penerapan laboratorium virtual untuk meningkatkan pemahaman konsep siswa. *EduChemia* Vol.2, No.2, Juli 2017 (Jurnal Kimia dan Pendidikan)
- Hidden Curriculum (2014). In S. Abbott (Ed.), *The glossary of education reform*. Dapat di unduh melalui <http://edglossary.org/hidden-curriculum>
- Imansari, N. (2017). Manajemen laboratorium pendidikan teknik elektro (studi kasus di fkip-universitas PGRI Madiun). *JUPITER (Jurnal Pendidikan Teknik Elektro)*, Volume 2, Nomor 1, Edisi Maret 2017, 1-7
- Peraturan Bersama Mendiknas dan Ka BKN no 02/V/PB/2010 dan No 13 tahun 2010 tentang petunjuk pelaksanaan jabatan fungsional pranata laboratorium pendidikan dan angka kreditnya
- Peraturan bersama Mendiknas-BKN. Lampiran I, II, III
- Rosada, R. Kadarisman, dan Raharjo. (2017). *Pengelolaan dan pemanfaatan laboratorium IPA*. Jakarta: Kemendikbud
- UU Nomor 8 Tahun 1974 tentang Pokok-Pokok Kepegawaian
- UU Nomor 43 Tahun 1999 tentang jabatan Fungsional
- UU Nomor 20 Tahun 2003 tentang Sist Pendidikan Nasional
- Vendamawan, R. (2015). Pengelolaan lab kimia. *METANA*, Vol. 11 No. 02, DESEMBER 2015, Hal. 41 – 46