

Development of Field Guide Book Identification of Anuran Species in Lambung Mangkurat KHDTK: The Result of Expert Review

Zainudin ^{(1) (2) *}, Yudi Firmanul Arifin ⁽³⁾, Atiek Winarti ⁽⁴⁾

⁽¹⁾ Master of Biology Education-Postgraduate Program, Faculty of Teacher Training and Education Lambung Mangkurat University

⁽²⁾ Study Center and Conservation of Biodiversity of Indonesia

⁽³⁾ Faculty of Forestry, Lambung Mangkurat University

⁽⁴⁾ Chemistry Education, Faculty of Teacher Training and Education Lambung Mangkurat University

*Corresponding Author Email: zainudinbasriansyahakar@gmail.com

Article Information

Keyword:

Development
Book
Field Guide
Anura
KHDTK

Kata Kunci:

Pengembangan
Buku
Panduan Lapangan
Anura
KHDTK

History:

Received : 16/07/2020
Accepted : 19/09/2020
Published : 01/10/2020

Abstract

The forest areas with special-purpose (KHDTK) Lambung Mangkurat University is an important learning resource for many people, especially students. One of the biodiversity in the area that can be utilized is the diversity of Anura. For identified Anuran species, we need the field guide book according to complete with areas character, Anuran list, and supported by the content that is simple and easy to understand. Therefore the field guide book was developed in such a way using the development model by Tessmer. The result of an expert review shows that this field guide book has been very valid (88%) with criteria that can be used without revision. Attractive design, complex content, with simple language make this field guide not only can be used for students but also by the general people.

Abstrak

Kawasan Hutan Dengan Tujuan Khusus (KHDTK) Universitas Lambung Mangkurat merupakan sumber belajar penting bagi banyak pihak, terlebih mahasiswa. Salah satu keanekaragaman hayati di kawasan tersebut yang dapat dimanfaatkan adalah keanekaragaman Anura. Untuk melakukan identifikasi jenis diperlukan buku panduan identifikasi yang sesuai dengan karakter wilayah dan keanekaragaman anura di dalamnya serta ditunjang dengan komponen isi yang sifatnya sederhana dan mudah untuk dimengerti. Oleh karenanya, buku panduan lapangan identifikasi jenis anura ini dikembangkan sedemikian rupa menggunakan model pengembangan oleh Tessmer. Hasil penilaian ahli menunjukkan bahwa buku panduan lapangan ini memiliki kriteria sangat valid (88%) dan dapat digunakan tanpa revisi. Desain menarik, isi yang kompleks, dengan bahasa yang sederhana membuat buku panduan lapangan ini tidak hanya dapat digunakan untuk kalangan pelajar saja namun juga oleh masyarakat umum.

A. Introduction

Indonesia as a mega biodiversity country has 10% of the total animals in the world (LIPI, 2014). A small portion of this number is herpetofauna, of which Anura (frogs/toads) is one of the most abundant biodiversity. At least, 16% of the world's herpetofauna can be found in Indonesia (CEPF, 2001). Amphibiaweb (2017) mentioned that the density of Anura in Indonesia is greater than in Australia. However, this group is not maximally utilized for national development, like most of Indonesia's other biodiversity (von Rintelen *et al.*, 2017). Anura's body shape and way of life are different compared to most animals, making these taxa often considered disgusting and dangerous.

Anura has been used for a long time. Anurans are a good environmental indicator, most of them act as natural controllers for disease-carrying insects (Iskandar, 2002; Mokany & Shine, 2003; Rubbo *et al.*, 2011; Kusri, 2013; Murugan *et al.*, 2015; Waterings, 2015). Tyler (1994), Gurdon & Hopwood (2003), Conlon & Sonnevend (2010) and Bowatte *et al.* (2013) research indicates that this group has been used for a long time in the medical world as experimental animals.

Anura is also a commodity that is consumed by certain ethnic groups in Indonesia. Report by Kusri & Alford (2006) and Kusri (2019) say that several types of Anura in Indonesia have become export commodities. Even now, Indonesia has become the number one country as the world's exporter of frozen frog legs. Anura also has other economic values if it is used properly. For example, as a treat for ecotourism attractions or used as learning materials in the class.

One of the locations that have high Anura diversity is the Special Purpose Forest Area (called KHDTK) owned by Lambung Mangkurat University. The diversity of Anura in this location is quite abundant, but until now it has not been fully utilized. This can be seen from the lack of activity related to Anura's presence at that location, besides that, so far, no records, research, or even books have been found that raise Anura in its area. This potential is worthy of being raised to the general public. The lack of knowledge about Anura at the KHDTK is the urgency for us to develop a field guide book for identifying Anura species in that location. An approach through a comprehensive design is needed to raise the existing potential, especially into a field guidebook. Given that so far, Anura has only been a topic of discussion among the scientific community, not the people commonly. Therefore we need the development of Anura species information at KHDTK into a field guide book that is compatible with various user backgrounds so that activities

related to Anura's observation at that location run well.

B. Materials and Method

The type of research carried out is Development Research (DR). The product developed in this study was a field guide book for the identification of Anura species at KHDTK. The development model refers to Tessmer (1998) which includes 3 stages of development, namely: self-evaluation, prototyping (expert review, one-to-one, and small group), and field tests. However, the discussion is limited to the expert review stage.

The self-evaluation stage was carried out by us to analyzing the needs and content. Most of it was related to the urgency of making field manuals so that Draft 1 Field Guidebooks were produced which would later become the main basis for prototype development (*prototyping*).

Expert review is the main step in this research. We choose 7 validators who would validate the Draft 1 that had been made. The validator team consists of material experts related to Anura diversity and its ecology, media experts, and practitioners (who working with Anura). In conducting the assessment, the validator team will be equipped with a questionnaire adapted from Depdiknas (2008) and Setiawan (2017). The results of the assessment using the questionnaire are considered as validity results by experts who are generally used to make upgrading and improve the quality of the products being developed.

The results of the validity of Draft 1 will be analyzed descriptively using a modified calculation from Purwanto (2012), as follows:

$$P = \frac{\sum xi}{\sum x} \times 100\%$$

Note:

P = Percentage of Validity (%)

$\sum xi$ = Total Score Validator

$\sum x$ = Maximum Score

The results of the expert judgment will then be interpreted using Table 1:

Table 1 Validity Criteria

Percentage (%)	Criteria	Explanation
$80,1 \leq P \leq 100$	Very Valid	Can be used without revision
$60,1 \leq P \leq 80$	Valid	Can be used with small revisions
$40,1 \leq P \leq 60$	Quite Valid	Can be used with a lot of revisions

Percentage (%)	Criteria	Explanation
$20,1 \leq P \leq 40$	Less Valid	Can be used with big revisions
$0 \leq P \leq 20$	Invalid	Unused/total revised

Note: Modified from Purwanto (2012)

C. Results and Discussions

Information on biodiversity is an important source of learning (knowledge) for society. However, so far the use seems to have only been used by intellectuals, in this case, practitioners, academics, and students. Indirectly this will have an impact on the conservation of biodiversity itself.

Insights on biodiversity are important information for various parties, especially in the process of preserving local resources which requires a comprehensive understanding of local needs, perceptions, knowledge, and value systems (Boissière *et al.*, 2013). The limited use of this kind of information is one of the obstacles to conservation activities in Indonesia. Information from research activity is only used by a limited group, such as academics and practitioners. Even though the information obtained from the process must be disseminated to all levels of society.

Underdevelopment of information about Anura is the result of these problems. Anura's high usefulness value is eventually masked by the view that taxa are a "disgusting and dangerous" animal (Kusrini, 2013). Besides, there are limited resources for obtaining information about this taxa, be it in the form of books, graphic designs, and so on, made with the dominating complexity of science so that it is difficult to be used by the general public.

Based on the weaknesses in terms of delivering the information, we designed an information dissemination material in the form of a field guide for the identification of Anura species. This book was developed from the results of observations of the Anura's species which can be found at KHDTK. The graphic design of the Anura identification field guide book can be seen in Figure 1.

Draft 1 (Figure 1) which has been designed and equipped with communicative content is then validated by experts. The results of the validity (assessment) of the experts are presented in Table 2. The assessment by experts as contained in Table 2 is based on a product validity questionnaire that contains 6 assessment components, 15 sub-components with 50 statement items. The assessment score is carried out with a scale system (1-4) which indicates the suitability of the product draft developed with the standard components of the product assessment. Of the 15 sub-components assessed, there were 7 sub-components with a value of 4 (very suitable), while 8 of them scored ≥ 3 .

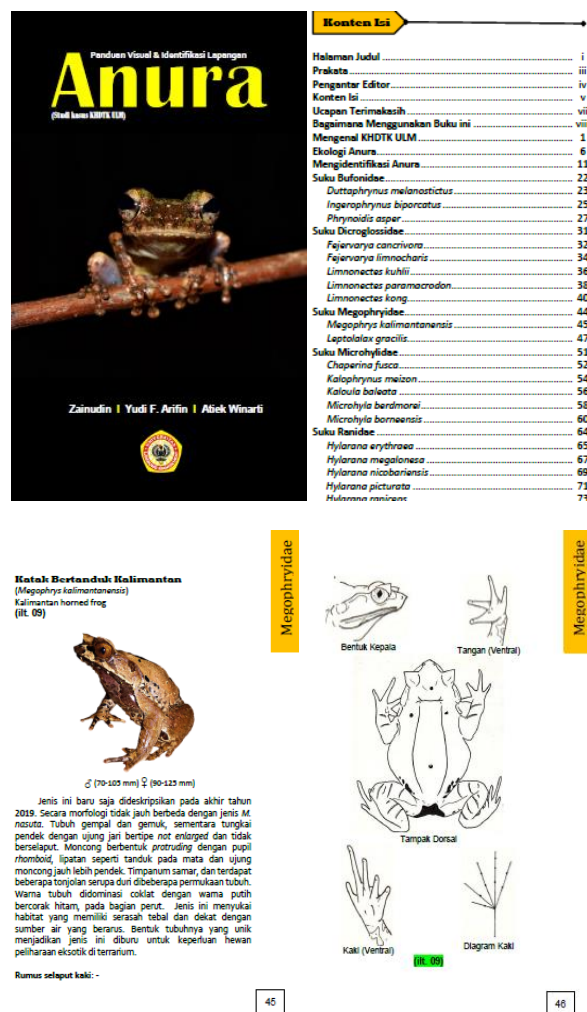


Figure 1
Graphic Design Shows Field Guide Cover, Content, Illustration of Species, and Species Description (clockwise)

Sub-components such as factual accuracy, content conformity with the target (respondent), completeness of presentation, legibility, typography, and photos/illustrations are parts that have been deemed appropriate by the validator while the other 8 sub-components need a little improvement. Validity is considered by experts to be crucial because it can indicate the quality of the product being developed (Akker, 2007; Nieveen & Folmer, 2013; Plomp & Nieveen, 2013; Ibrahim & Subali, 2017).

The validity of a field guide can be said to have different criteria when compared to other types of scientific books. Its use which focuses more on outdoor activities and is generally used by ordinary people to recognize certain objects (Schmidt, 1999) makes the validity element of this product focus on aspects, appearance, presentation, and function.

Tabel 2 Validity of the Field Guidebook Identification of Anuran Species in Lambung Mangkurat KHDTK

Assessment Components	Sub Components	Average Score of the Validator
Content eligibility	Accuracy of Facts	4
	Content Match with Target	4
Presentation Feasibility	Technical	3,43
	Presentation	
	Serving Support	3,21
	Completeness of Serving	4
Language Eligibility	Suitability with Respondents	3,14
	Legibility	4
	Compliance with PUEBI	3,14
	Usage of Terms	3,29
	-	3,16
Book size		3,16
		3,43
Cover Design	Layout	3,43
	Typography	4
	Photo/Illustration	4
Content Design	Layout	3,49
	Typography	4
	Photo/Illustration	4
$\sum xi$		175
P		88%
Criteria		Very Valid

Note:

1. $\sum xi$ is the total score of the validators.
2. P is the percentage of validity (%).

Therefore, the proposed product development design must prioritize these elements. Expert review of the field guide developed as a whole indicates that the product assessed is suitable for use (very valid). This refers to several advantages including:

1. The contents of the book are supported by accurate facts and written according to the target market/respondents.
2. The material is presented in a complete, consecutive, and detailed is equipped with supporting elements that attract readers' interest.
3. The contents of the book are easy to understand because they are arranged with the right language rules. The content is also adjusted to the respondent's needs, words/sentences that are considered difficult to understand are simplified and given an easy to understand explanation.
4. An attractive but simple writing style, supported by a minimalist and attractive layout and design.
5. The description section does not only consist of a series of phrases but is also supported by various photos of good quality, according to reality, and attracting readers' interest. Also, a detailed description of the physical characters that cannot be clearly described can be seen in

the illustration given. This will make it very easy for users to recognize the species being studied easily.

The content material is presented in a structured, detailed, and consistent in terms of discussion. This shows that the field manual that has been developed can be categorized as a good book. Akbar (2013) states that a good book at least has the characteristics, accuracy, relevance, communicative, systematic, and complete.

The distinctive feature that distinguishes field guides from other books is the character of the content. Stevenson *et al.* (2003) explained that the format of a field guide is divided into two important parts, the first part contains information on biological, taxonomic, morphological, observation techniques, and species distribution. While the second part acts as a supporter of the description previously presented, this supporting material can be in the form of graphics, photos, or even illustrations that show the specific character of the species being referred to.

The arrangement of content following these characters and the addition of complementary elements in the form of photos and illustrations makes the product developed deserves to be called a field guide. The species description section contains information regarding the taxonomic position, local name, scientific name, morphological characters, habitat characteristics, and habits. Moreover, in the morphological description section, we add a real photo of the specimen described along with the important morphological characters that are drawn on the identification plate with the help of illustration images. This is intended to make it easier for users to interpret written information with the help of photos and illustrations. The Ministry of Environment-Forestry and the Indonesian Institute of Sciences stated that the purpose of the species identification book was to make it easier for users to identify species through morphological descriptions and visual guides (photo/illustration) (Kemen. LHK & LIPI, 2019).

Austen *et al.* (2016) argue that the presence of images in a field guide is essential, the reader's ability to use the book depends on the images served. The combination of images and identification clues (species descriptions) is considered to be a factor that can increase a person's ability to identify. The essence of the importance of a photo/illustration in a field guide or similar product is also emphasized by Fusini *et al.* (1998), Tang & Carroline (2004), Arsyad (2011), Jannah & Dwiningsih (2013), Istinigrum *et al.* (2016), Wustqo (2017), and Kemen. LHK & LIPI (2019).

In addition to the image which is an important part, other parts make the product developed have added value, namely in terms of legibility. This element is crucial because in general, a field guide is arranged in a dominant scientific language and style. Not only from the writing style but also in terms of the language terms used. In general, it is more dominated by scientific terms that are not understood by all people, especially the general public who previously had no background following the contents of the field guide study presented.

The language style used in the writing of the developed field guide content is made as simple as possible, the words/sentences used are sorted in such a way that they do not cause multiple meanings and are easy to understand, are written systematically, and are not convoluted. The sentences used have a balance between passive and active sentences. The choice of words and language style is something that must be considered especially when it is related to the respondent's suitability aspects both from knowledge and understanding ability.

These aspects broadly refer to aspects of coherence and legibility. Paying attention to these characteristics is something important, the main goal is so that the content presented in the developed field guide can be accepted and understood by various parties (Komaruddin, 2007; Suyitno, 2014, Dalman, 2014; Widiatmoko, 2015; Mulyadi, 2015; Fitriansyah, 2018). Khairoh & Nurhayati (2014) argues that a book can be said to be a good book if the vocabulary used is simple, light in language, short, and easier to understand. Referring to this opinion, the field guide developed has met the criteria as a good book.

In reality, some words cannot be changed or simplified without changing the meaning. This is a weakness that we are aware of. Words that cannot be translated into a language that is easier to understand are then included in the glossary section so that they can be understood. Mardiah (2018), provides an alternative that words or terms that are difficult to understand are to be defined or simplified so that they are easier to understand.

Other components that still need repair will then be reviewed. Revisions to the developed field guide are carried out gradually so that factors that can weaken the value of the product being developed can be minimized.

Information about how to identify Anura, where to find Anura, use of Anura to preparation before seeing Anura in nature is an added value of the product developed. This is another goal of a field guide, especially if it is related to the principles of product use and conservation as side

effects. As stated by Kusri (2007) and Za Gara (2010) that media such as posters, leaflets, books, and so on are good conservation tools to directly change people's perceptions other than through the education sector.

D. Conclusion

The field guide book for identifying Anura species at KHDTK, Lambung Mangkurat University is very valid with an expert review percentage of 88% and can be used without revision. Attractive design, simple language style, and complete with supporting photos and illustrations make the book being developed has more value compared to other books. Before being used and disseminated, it is recommended that the field guide book for identifying Anura species at KHDTK of Lambung Mangkurat University must pass the trial stage on a small scale user.

E. Acknowledgment (optional)

We would like to thank the expert validator team who helped in providing assessments, input, and suggestions on the Anura species identification field guidebook at KHDTK, Lambung Mangkurat University. Prof. Dr. H. M. Zaini, M.Pd., Meyninda Destiara, S.Pd., M.Pd., Sri Sumarni, S. Hut., M.Si., Agustina Ambar Pertiwi, S.Pd., M.Pd., dan Amalia Rezeki, S.Pd., M.Pd. The comments that you give play a role in improving the quality of the products being developed. Besides, we also want to thank Mr. Ferry F. Hoesain, MBA as editor and Tony Kusnadi who was very helpful during the data collection process. Siti Mardiah A. and Maedy Ripani who are very helpful in working on specimens at the laboratory level.

F. References

- Akbar, S. (2013). *Instrumen Perangkat Pembelajaran*. Bandung: Remaja Rosdakarya.
- Akker, J.V.D. (2007). An introduction to educational design research. *Proceeding of The Seminar Conducted at the East China Normal University, Shanghai (PR China), November 23-26, 2007*.
- Amphibiaweb. (n.d.). Retrieved June 12, 2017, Amphibian database website, <https://amphibiaweb.org/>
- Arsyad, A. (2011). *Media Pembelajaran*, Jakarta: PT. Raja Grafindo Persada.
- Austen, G. E., Bindemann, M., Griffiths, R. A., & Roberts, D. L. (2016). Species identification by experts and non-experts: comparing images from the field guides. *Scientific Reports*, 6(1), 1-7.
- Boissière, M., Locatelli, B., Sheil, D., Padmanaba, M., & Sadjudin, E. (2013). Local perceptions of

- climate variability and change in tropical forests of Papua, Indonesia. *Ecology and Society*, 18(4).
- Bowatte, G., Perera, P., Senevirathne, G., Meegaskumbura, S., & Meegaskumbura, M. (2013). Tadpoles as dengue mosquito (*Aedes aegypti*) egg predators. *Biological Control*, 67(3), 469-474.
- CEPF. (2001). *Profil Ekosistem: Ekosistem hutan Sumatera di dalam "Hotspot" keanekaragaman hayati sundaland Indonesia*. (versi terakhir) 11 De-seMBER, 2001.
- Conlon, J. M., & Sonnevend, A. (2010). Antimicrobial peptides in frog skin secretions. In *Antimicrobial Peptides* (pp. 3-14). Humana Press, Totowa, NJ.
- Dalman. (2014). *Menulis Karya Ilmiah*. Jakarta: PT Raja Grafindo Persada.
- Depdiknas. (2008). *Panduan Pengembangan Bahan Ajar*. Direktorat Jendral Manajemen Pendidikan Dasar Dan Menengah: Jakarta.
- Fitriansyah, M. (2018). *Pengembangan Buku Ilmiah Populer Tentang Echinodermata di Pulau Sembilan Kotabaru Untuk Siswa SMA Kawasan Pesisir Terhadap Kemampuan Berpikir Kritis*. Tesis Universitas Lambung Mangkurat. Tidak dipublikasikan.
- Fusini, U., William V., & Giorgio C. (1998). *Environmental Exploration and Protection*. <http://www.funsci.com/>
- Gurdon, J. B., & Hopwood, N. (2003). The introduction of *Xenopus laevis* into developmental biology: of empire, pregnancy testing, and ribosomal genes. *International Journal of Developmental Biology*, 44(1), 43-50.
- Ibrahim, M & Subali, B. (2017). *Pengembangan Bahan Ajar & Pengembangan Instrument Pengukuran Pembelajaran Biologi*. Banjarmasin: ULM Press.
- Iskandar, D. T. (2002). *The Amphibian of Java and Bali*. Bogor: Puslitbang LIPI.
- Istiningrum, R., Amin, M. & Lestari, U. (2016). Pengembangan Buku Ajar Biologi Sel Berbasis Bioinformatika. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*. 1(9): 1693-1699.
- Jannah, D. F & Dwiningsih, K. (2013). Kelayakan Buku Ajar Kimia Berorientasi Quantum Learning Pada Materi Pokok Kimia Unsur Untuk Siswa Kelas XII SMA. *UNESA Journal of Chemical Education*, 2(2).
- Kementerian Lingkungan Hidup dan Kehutanan & Lembaga Ilmu Pengetahuan Indonesia (LIPI). (2019). *Panduan identifikasi jenis satwa liar dilindungi: Herpetofauna*. Jakarta: Kemen. LHK.
- Khairroh, L, Rusilowati, A, & Nurhayati, S. (2014). *Pengembangan Buku Cerita Ipa Terpadu Bermuatan Pendidikan Karakter Peduli Lingkungan Pada Tema Pencemaran Lingkungan*. *Unnes Science Education Journal* 3 (2), 519-527.
- Komaruddin. (2007). *Kamus Istilah Karya Tulis Ilmiah*. Jakarta: Bumi Aksara.
- Kusrini, M. D. (2007). Konservasi Amfibi di Indonesia: Masalah Global dan Tantangan (Conservation of Amphibian in Indonesia: Global Problem and Challenges). *Media Konservasi*, 12(2).
- Kusrini, M. D. (2013). *Panduan bergambar identifikasi amfibi Jawa Barat*. Jawa Barat: Institut Pertanian Bogor.
- Kusrini, M. D. (2019). *Metode survey dan penelitian herpetofauna*. Bogor: IPB Press.
- Kusrini, M. D., & Alford, R. A. (2006). Indonesia's exports of frogs' legs. *Traffic Bulletin*, 21, 13-24.
- Lembaga Ilmu Pengetahuan Indonesia (LIPI). (2014). *Kekinian keanekaragaman hayati Indonesia*. Jakarta: LIPI Press.
- Mardiah A., Siti. (2018). *Pengembangan Perangkat Pembelajaran IPA SMP Konsep Sistem Pencernaan Berbasis Model Inkuiri Terbimbing dalam Melatihkan Keterampilan Berfikir Kritis Siswa*. Tesis Universitas Lambung Mangkurat. Tidak dipublikasikan.
- Mulyadi, M. (2015). Tingkat Keterbacaan Reading Materials Dalam Mata Kuliah Telaah Teks Bahasa Inggris STAIN Pamekasan. *NUANSA: Jurnal Penelitian Ilmu Sosial dan Keagamaan Islam*, 12(1), 135-150.
- Murugan, K., Priyanka, V., Dinesh, D., Madhiyazhagan, P., Panneerselvam, C., Subramaniam, J., ... & Alarfaj, A. A. (2015). Predation by Asian bullfrog tadpoles, *Hoplobatrachus tigerinus*, against the dengue vector, *Aedes aegypti*, in an aquatic environment treated with mosquitocidal nanoparticles. *Parasitology Research*, 114(10), 3601-3610.
- Mokany, A., & Shine, R. (2003). Competition between tadpoles and mosquito larvae. *Oecologia*, 135(4), 615-620.
- Nieveen, N., & Folmer, E. (2013). Formative evaluation in educational design research. *Design Research*, 153, 152-169.
- Plomp, T., & Nieveen, N. (2013). *Educational Design Research*. Enshede: Netherlands Institute for Curriculum Development (SLO).
- Purwanto. (2012). *Evaluasi hasil belajar*. Yogyakarta: Pustaka Pelajar.
- Rubbo, M. J., Lanterman, J. L., Falco, R. C., & Daniels, T. J. (2011). The influence of amphibians on mosquitoes in seasonal pools: can wetlands protection help to minimize disease risk?. *Wetlands*, 31(4), 799-804.

- Schmidt, D. (1999). *A guide to field guides: identifying the natural history of North America*. USA: Libraries Unlimited.
- Setiawan, M. E. (2017). *Pengembangan Buku Ilmiah Populer Untuk Masyarakat Pecinta Alam Melalui Eksplorasi Tumbuhan Survival di Kawasan Taman Nasional Bromo Tengger Semeru*. Tidak dipublikasikan. Tesis Program Studi Pendidikan Biologi, Pascasarjana, Universitas Negeri Malang.
- Stevenson, R. D., Haber, W. A., & Morris, R. A. (2003). Electronic field guides and user communities in the eco-informatics revolution. *Conservation Ecology* (11955449), 7(1).
- Suyitno, I. (2014). Pengembangan Bahan Ajar Bahasa Indonesia untuk Penutur Asing (BIPA) berdasarkan Hasil Analisis Kebutuhan Belajar. *Wacana, Journal of the Humanities of Indonesia*, 9(1).
- Tang, R. Fawcett & Caroline R. (2004). *New Book Design*. UK: Laurence King Publishing.
- Tessmer, M. (1998). *Planning and Conducting Formative Evaluation*. London: Cogan.
- Tyler, M.J., (1994). Frog cure herpes. *Australian Natural History Magazine* 24(8): 10-11.
- von Rintelen, K., Arida, E., & Häuser, C. (2017). A review of biodiversity-related issues and challenges in megadiverse Indonesia and other Southeast Asian countries. *Research Ideas and Outcomes*, 3, e20860.
- Weterings, R. (2015). Tadpoles of three common anuran species from Thailand do not prey on mosquito larvae. *Journal of Vector Ecology*, 40(2), 230-232.
- Widiatmoko, W. (2015). Analisis Kohesi Dan Koherensi Wacana Berita Rubrik Nasional Di Majalah Online Detik. *Jurnal Sastra Indonesia*, 4(1).
- Wutsqo, U. (2017). *Pengembangan Field Guide Keanekaragaman Orthoptera di Kawasan Sungai Oyo Sebagai Sumber Belajar Biologi*. Skripsi Universitas Islam Negeri Sunan Kalijaga.
- Za Gara, A. (2010). The Use Of Social Marketing As A Means Of Promoting Environmental Conservation: A Case Study Of Indonesian Biodiversity Campaigns.