Developing The Cirebon City Toponymy-Based Digital Encyclopedia as a Plantae Learning Resource for the Tenth-Grade Senior High School Students

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ABSTRACT

This study aims to create a toponymy-based Digital Encyclopedia of the Cirebon City area which has biological elements so that it can be used as a learning resource for Plantae material for class X SMA/MA which is suitable for use in learning. This type of research is Research and Development (R&D) using the ADDIE model. The results showed that there were 9 toponyms with biological elements in the form of plant names in Harjamukti District and Kesambi District in the Cirebon City area. The development of research results into learning resources on Plantae material in the form of a Digital Encyclopedia made using software called Sketchware. The Digital Encyclopedia created and developed in the form of an application can be run on smartphones with the Android operating system. The Digital Encyclopedia is suitable for use as a learning resource for Plantae Class X SMA/MA based on validation tests and teacher and student responses

Pembuatan Ensiklopedia Digital Berbasis Toponimi Wilayah Kota Cirebon Sebagai Sumber Belajar Materi Plantae Kelas X SMA/MA

ABSTRAK: *Penelitian ini bertujuan untuk membuat Ensiklopedia Digital berbasis toponimi wilayah Kota Cirebon yang memiliki unsur biologis sehingga dapat dijadikan sumber belajar pada materi Plantae kelas X SMA/MA yang layak digunakan dalam pembelajaran. Jenis penelitian ini adalah Research and Development (R&D) dengan menggunakan model ADDIE. Hasil penelitian menunjukkan terdapat 9 toponimi berunsur Biologi berupa nama tumbuhan pada Kecamatan Harjamukti dan Kecamatan Kesambi di wilayah Kota Cirebon. Pengembangan hasil penelitian menjadi sumber belajar pada materi Plantae berupa Ensiklopedia Digital dibuat dengan menggunakan software bernama Sketchware. Ensiklopedia Digital yang dibuat dan dikembangkan berupa aplikasi dapat dijalankan pada smartphone dengan sistem operasi Android. Ensiklopedia Digital layak digunakan sebagai sumber belajar materi Plantae Kelas X SMA/MA berdasarkan uji validasi serta respon guru dan siswa.*

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INTRODUCTION

Learning resources can be utilized in the form of messages, humans, materials, tools, methods or techniques, and the environment for the benefit of the learning process, either directly or indirectly (Supriadi, 2017;Rahmayani, et al., 2021). One alternative learning resource that can be made for biology learning is an encyclopedia (Ayu, 2020). According to the Indonesian National Dictionary (KBBI), an encyclopedia is a universal work that collects descriptions of various branches of science or certain fields of science in separate articles and is arranged alphabetically (Fakhri, 2020).

Yuslina (2014) in (Hielganingsih, 2021) explains that an encyclopedia can be interpreted as a book that presents basic and complete information about a problem in various fields of science and is arranged alphabetically. The difference between encyclopedias and other learning resources is pictures or illustrations accompany that information according to the topics discussed. The information can be found easily because they have been arranged alphabetically (Susanti) 2017 in Hielganingsih, 2021).

Winaryati (2012) in (Irawati, 2015) stated that science learning could take advantage of the environment as a source of learning, including the local potential of an area. Learning resources based on local potential can help students learn by linking the material and reality so that students can apply the material learned to the life around them(Jufrida *et al.*, 2018). One of the local potentials that have not been widely utilized is the naming system of a place (Wulandari et al., 2022).

The place naming system is the procedure or rules for giving the name of a place at a certain time. It is called "toponymy" (Nurutstsany et al., 2020;Segara, 2017). Toponymy in the Cirebon City area has a uniqueness that is different from other areas. The past's distribution of plants and animals can be studied by understanding the toponymy (Gita & Nila, 2019). Toponymy with biological elements can be used as a learning resource related to the concept of distribution, which is reflected in the diversity of biosphere phenomena typical of coastal areas, especially Cirebon (Muhyidin, 2017). Utilizing local potential as a learning resource will provide more value to learning (Irwandi & Fajeriadi, 2020).

The common problem in learning about the Plantae kingdom is that students have difficulty understanding the broad materials. Besides, students also have difficulty distinguishing the characteristics of each division within the Plantae kingdom. If delivered abstractly, material that has a broad scope cannot help students understand the concept of the material (Mendala, et al., (2019). Therefore, it will be easier for students to understand the material and distinguish the characteristics of each group of the toponymy of the Cirebon City area. Biological elements of plant names can be used as a source of learning. Therefore, local potential in Cirebon City was chosen because of the biological elements of plant names.

METHOD

The type of research used was research and development (R&D) with the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). The 'Analysis' consists of curriculum analysis, learning needs analysis, and student character analysis. The toponymy analysis was also performed in Harjamukti District and Kesambi District based on research by Ruspandi & Mulyadi (2014) and Segara (2017).

The 'Design' was done by making flowcharts and storyboards adjusted to the analysis results. The 'Development' started with creating a Digital Encyclopedia based on the flowchart and storyboard. The application testing was carried out by media experts, material experts, and linguists.

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The Digital Encyclopedia was declared feasible by media experts, material experts, and linguists. It was then implemented to biology teachers and ten students from class X IPA 4 of SMA Negeri 7 Cirebon City. The samples were determined using a purposive sampling technique considering Android smartphone possession. The 'Evaluation' stage was carried out by making several improvements based on criticism and suggestions from experts, teachers, and students.

This research was conducted in the city of Cirebon. The sampling location was determined using the purposive sampling technique to determine the sampling intentionally based on a specific purpose (Sofian et al., 2019; Barus et al., 2021; Tari et al.,2020) in (Valentino et al., 2022). The determination of this sampling point was chosen based on the representativeness of the sample area, vegetation density, the ability of the researcher to reach the observation location, and the safety of the researchers (Valentino et al., 2022).

Data collection techniques used were observation, interviews, and questionnaires. The observations and interviews were conducted to collect data in schools. The data obtained from the school were curriculum analysis, needs analysis, and students' character analysis. Furthermore, field observations were carried out to collect plant data related to the toponymy of the Cirebon City area.

The questionnaire consisted of validation and response questionnaires for teachers and students. The data were analyzed qualitatively and quantitatively. The qualitative data analysis was done by displaying digital encyclopedia development data as a whole, while the quantitative data analysis was used to analyze the feasibility of the digital encyclopedia using a feasibility test formulation.

The quantitative data questionnaire calculation was a numerical assessment of the questionnaire using a Likert scale. The scores were 1 (poor), 2 (low), 3 (moderate), 4 (high), 5 (excellent). The research data were processed using statistical analysis using the following formula Riduwan (2011) in (Fatmala & Upik, 2016) :

$$P = \frac{\Sigma F}{\Sigma N} \times 100\%$$

Description: P= percentage, F= Answer score, N= Total score

Table 1. Quantitative Data Interpretation

No	Scale Value	Percentage (%)	Category/Quality Aspect
1	5	81-100	Highly feasible
2	4	61-80	Feasible
3	3	41-60	Fairly feasible
4	2	21-40	Less feasible
5	1	0-20	Not feasible

This research was conducted from February 2022 to May 2022 by conducting a needs analysis and ended by improving the final product according to comments and suggestions for improvement from experts and users.

RESULTS AND DISCUSSION

This research was conducted in two districts with six sub-districts out of a total of 5 districts and 22 sub-districts in Cirebon City. Nine plant species were identified based on research by Ruspandi & Mulyadi (2014); Segara (2017). These nine species can only represent the Angiospermae subdivision of the Spermatophyta division in Plantae.

Table 2. Identification of Toponymy with Biological Elements in the Cirebon City Region

No	Name	Toponymy	Administrative Area	Location Found	Number of Species	Description
1	Benda or Terap (*Artocarpus elasticus* reinw.)	Benda Kerep	Harjamukti district Argasunya sub-district	-	-	Cannot be found
2	Kecapi or cotton	Kecapi	Harjamukti district	-	-	Cannot be

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No	Name	Toponymy	Administrative Area	Location Found	Number of Species	Description
	fruit (*Sandoricum koetjape*)		Kecapi sub-district			found
3	Kesambi (*Schleichera oleosa*)	Kesambi	Kesambi district Kesambi sub-district	Kesambi street and Kalilunyu Benda Kerep village	>10	Can be found easily in an empty lot
4	Kuranji or tamarind-plum (*Dialium indum*)	Kuranji	Harjamukti district Harjamukti sub-district	-	-	Cannot be found
5	Maja or bael (*Aegle marmelos*)	Majasem	Kesambi district Karyamulya sub-district	Kalilunyu Benda Kerep village	>10	Can be found easily in an empty lot
6	Mangga or mango (*Mangifera indica*)	Kebonpelok	Harjamukti district Kalijaga sub-district	Pramuka street Kebonpelok	>10	Can be found easily
7	Melati or jasmin (*Jasminum sambac*)	Kampung Melati	Kesambi district Kesambi sub-district	Kalilunyu Benda Kerep village	>10	Can be found easily in villagers' yards
8	Rumput Gajah or elephant grass (*Pennisetum purpureum*)	Suketduwur	Harjamukti district Kalijaga sub-district	RW. 10 Suket Duwur	>10	Can be found easily in an empty lot
9	Tanjung or bullet wood (*Mimusops elengi*)	Kalitanjung	Harjamukti district Harjamukti sub-district	Kalitanjung street	>10	Can be found easily beside the roads

The sampling was carried out to determine the selected study location based on the representativeness of the sample area, the density of vegetation, the ability of the researchers to reach the observation location, and the safety of the researchers. Researchers conducted field observations to document directly the plants that could be found after determining the names of the areas. Based on the observations, the researchers could only find six plants, namely kesambi, maja (bael), mangga (mango), melati (jasmine), rumput gajah (elephant grass), and tanjung (bullet wood). At the same time, 3 of them, namely benda (terap), kuranji (tamarind-plum), and kecapi (cotton fruit), could not be found.

The toponym of the Kesambi area located in the Kesambi Village comes from a tree commonly found in dry areas such as Cirebon with the Latin name *Schleichera oleosa* and is related to rambutan (Kumar & Tomar, 2019). Because it has dense, heavy, and very hard wood, in the past, fishermen in the Cirebon area used it as a boat anchor. During field observations, researchers found this plant at Kesambi street and the Kalilunyu Benda Kerep village, Argasunya.

The number of trees found was more than ten. All the *Kesambi* trees found were medium to large, with a height of approximately 4 meters. When it was found, this tree was not flowering and bearing fruit, so the researchers only got photos of the roots, stems, and leaves. Taking photos of the roots was done by photographing the buttresses of the roots only.

According to Ruspandi & Mulyadi (2014), the Majasem region, located in Kesambi Village, can be literally translated as a sour *Maja* fruit (*Aegle marmelos*). During field observations, the researchers did not find this plant along the main road. However, the researchers found that this plant grew in the village of Kalilunyu Benda Kerep, Argasunya. The roots cannot be photographed because the plant size was too big.

There were more than ten *Maja* trees of medium size with a height of approximately 2 meters. When they were found, one tree was bearing fruit, but the flowers could not be found. Therefore, the

researchers only got photos of the fruit, stems, and leaves. Root photos were not taken because the plant size was quite large.

The toponym of the Kebon Pelok area, located in the Kalijaga Village, has a biological element. However, the meaning of the naming of the region has not been explained in the results of this research. Thus, the researcher tried to find out the meaning of the naming through a literature study. If we interpret each word according to the KBBI, "*Kebon*" means garden, and "*Pelok*" means mango seeds (Muhyidin, 2017). Therefore, the toponym of Kebon Pelok can be interpreted as a garden planted with many mango seeds.

According to research from Hariani, et al., (2014), the Kebon Pelok has a total area of 2,576.61 m². During field observations in this area, mango trees were easy to find. The number of mango trees found was more than ten. Some were medium to large, with a height of approximately 2-4 meters. When they were found, some trees were flowering and bearing fruit. Then, the researcher took photos of flowers, fruit, stems, and leaves. The roots could not be photographed because the sizes of the plants were too large.

The toponym of Kampung Melati, located in Kesambi Village, has an element of biology. However, the meaning of the naming of the region has not been explained in the results of this research. The researchers tried to find out the meaning of the naming through the literature study. If we interpret each word according to the KBBI, then the toponym of Kampung *Melati* can be interpreted as a village planted with a lot of Jasmine.

Jasmine could not be found during RT 02 RW 04 Kampung Melati field observations. However, the researchers found this plant in the village of Kalilunyu Benda Kerep, Argasunya. The number of Jasmine plants found was more than ten. Some of them were small to medium in size, with a height of approximately 1-2 meters. When they were found, some jasmines were blooming without fruit. The researchers only took photos of the flowers, stems, and leaves.

The toponym of the Suket Duwur area, located in the Kalijaga Village, Harjamukti District, according to Segara (2017), is taken from two Cirebon words, namely "*Suket*," which means grass, and "*Duwur*," which means tall (Daman, 2017). In the past, this area had very tall grass vegetation formations. However, during field observations, the most common type of tall grass found in the RW 10 Suket Duwur area has the Latin name *Pennisetum purpureum*. According to Segara (2017), the Latin name of this plant is Imperata cylindrica (L.) Beauv.

Elephant grass grows into clumps with a width of up to 1 meter or more (Ramadani, 2019;Kurnia, 2021). The number of plants found was more than ten in each clump. Some of them were small to medium in size, with a height of approximately 1-2 meters. When it was found, the plant was not blooming. Therefore, the researchers only took photos of the roots, stems, and leaves.

The toponym of the Kalitanjung region, located in the Harjamukti Village, means a river overgrown with Tanjung trees (*Mimusops elengi*) (Rifai & Wulandari, 2020). During field observations in this area, Tanjung trees were very easy to find, especially along the edge of the main road around the Kalitanjung market. The number of trees found was more than ten. Some were medium to large, with a height of approximately 2-4 meters. When it was found, some trees were not flowering and bearing fruit. Therefore, the researchers only took photos of the stems and leaves. The roots could not be photographed because the plant size was too large.

The toponym of Benda Kerep comes from two words, namely "Benda" which denotes the Benda tree (*Artocarpus elasticus*), and "Kerep" in the Cirebon language, which means meeting. According to Ruspandi & Mulyadi (2014) and Segara

(2017), the toponym of the Benda Kerep area, located in Argasunya Village, has a close meaning and background to the Benda tree (*Artocarpus elasticus Reinw.*). According to Chozin & Jamhuri (2019), before becoming a settlement, this area was originally a wilderness belonging to the Kanoman Palace and was named Cimeuweuh. However, because of the many Benda trees that grew around the place, the name Cimeuweuh finally changed and was better known as Benda Kerep (Hasanah & Junaedi, 2021).

This area is now a center for a local tradition-based Islamic learning system in the southern area of Cirebon City. This plant was not found during field observations in the village of Kalilunyu Benda Kerep, Argasunya. However, this plant can still be found in the main yard of the sacred complex of Prince Pasarean and Ki Buyut Tambak, Gegunung Village, Sumber District, Cirebon Regency (Saptono & Widyastuti, 2019), and Taman Kehati Bumi Patra, Indramayu (Heriyanto, & Gunawan 2020).

The toponym of the Kecapi area in the Kecapi Village is the Kecapi or Sentul tree (*Sandoricum koetjape*) (Pambudi et al., 2021). This area is allocated to housing which is now densely populated. Researchers did not find this plant during RT 07 RW 17 Ciremai Giri field observations. This plant can still be found at the Katingan Botanical Gardens, Central Kalimantan (Lestari, 2017), and the Mekarsari Cicurug Conservation Park, Sukabumi (Gunawan, 2019).

The toponym of the Kuranji area, located in the Harjamukti Village, is included as one of the places with biological elements based on Segara (2017). However, the meaning of the naming of the region has not been explained in the results of his research. Therefore, the researchers tried to find out the meaning of the naming through the literature study. It is known that Kuranji has the Latin name *Dialium indum* and is one of the endemic plants of Kalimantan based on research by Noor, et al., (2019). Other names are tamarind-plump (Usliana, 2020) or keranji (Tandra, 2017).

The researchers did not find Kuranji plants during field observations in RT 02 RW 12 Kuranji. This area is allocated to be an inter-provincial bus terminal area that is still active today. According to research by Martini, et al., (2020), the Harjamukti terminal opens employment opportunities for local residents and innkeepers. This may be one reason why people began building settlements, roadside stalls, and large-scale inns. Coupled with the site area, which has very little green open space and ornamental plants, this is one of the reasons why researchers could not find these plants during field observations.

Aspita (2019) also argues that the Keranji tree is rarely cultivated and is a wild plant used or cut down as wood. The same thing happened in Kalimantan. This tree usually grows wild in the forests and is now starting to be rare due to the conversion of land for plantations or agriculture. However, suppose you look at the condition of the Argasunya Village, Kecapi Village, and Harjamukti Village, located in Harjamukti District with an area of 17.6 km^2 and a dense population of 7,115 people/km in 2021. In that case, land conversion is highly possible due to the construction of residential housing complexes. As a result, Benda, Kecapi, and Kuranji plants are increasingly difficult to locate in the areas.

The researchers designed the initial media by making storyboards and flowcharts. The appropriate design was then developed into a digital encyclopedia assisted by Sketchware software. After the initial product development process had been completed, the product was then validated by experts. Two lecturers acted as validators of this digital encyclopedia. The lecturer came from the Biology Study Program of IAIN Syekh Nurjati and one Indonesian teacher at SMAN 7 Cirebon City.
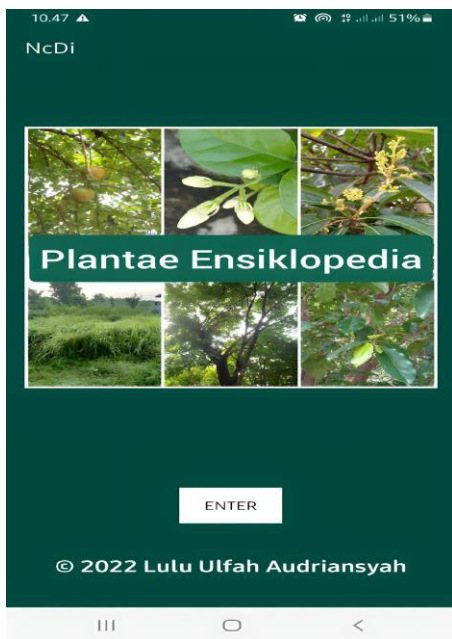
Figure 1. Initial Display

Figure 1 shows the initial screen containing the logo, "enter" (if you want to go to the main page), and credit. The logo is an image of six plants found during field observations. The main menu display shown in figure 2 will appear when the user presses the "enter" button on the initial screen. The main menu contains a brief description of the digital encyclopedia, concept maps, materials, practice questions, glossary, and bibliography.


Figure 2. Main Menu Display

The aspects assessed by the media experts were media and design, while the material expert assessed the content quality or material, learning objectives, feedback, adaptation, and motivation. Furthermore, the aspect assessed by the linguists was the language feasibility of the Digital Encyclopedia. The results of expert validation can be seen in Diagram 1.
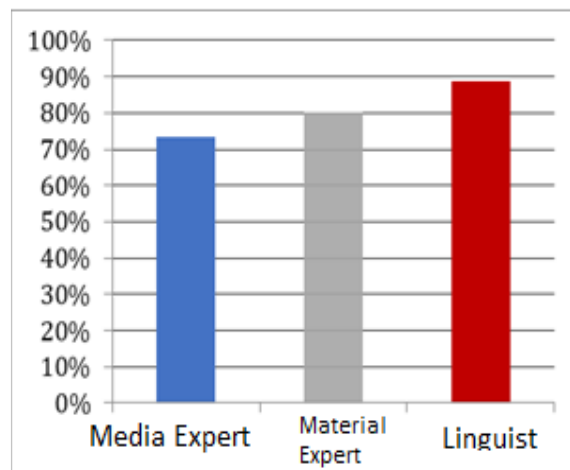
Figure 3. The Result of Expert Validation

The scoring percentage from the media expert was 73.33%, which means the product was feasible to use. The material expert gave a score of 80%, which means it was feasible to use. The linguists scored 88.57%, meaning the product was highly feasible. The average value of the expert validation is 80.63% in the feasible category.

A limited trial was carried out after the media was declared feasible and improved according to the advice of the experts. The trial was conducted once to ten students and one biology teacher at SMAN 7 Cirebon City. The teacher response questionnaire sheet contained all aspects assessed by experts, namely media, design, quality of content or materials, learning objectives, feedback and adaptation, motivation, and language appropriateness. At the same time, the student response questionnaire sheet contained an assessment of learning motivation, the effectiveness of media, and language.

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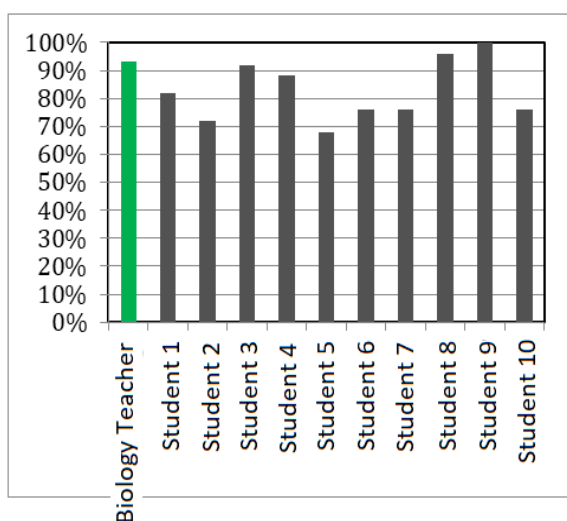
Figure 4. The Recapitulation of Teacher and Student Response Questionnaires

Figure 4 shows the results of the teacher's response questionnaire with a value of 93.33% in the highly feasible category. The value of the questionnaire response of ten students was 82.6% in the highly feasible category. The average value of the user test results by the teacher and ten students was 89.76%. Therefore, the product was included in the highly feasible category.

The average overall assessment by experts, teachers, and students was 84.28%. Based on the overall assessment, it can be concluded that the developed digital encyclopedia was feasible to be used in the learning process. Some suggestions for improvement have also been made from media, design, quality of content or materials, learning objectives, feedback and adaptation, motivation, and language in the development process.

CONCLUSIONS AND SUGGESTIONS

The results showed nine toponyms with biological elements in the form of plant names in Harjamukti District and Kesambi District in the City of Cirebon. Six of them are located in the Harjamukti sub-district, Benda Kerep in Argasunya Village, Kalitanjung and Kuranji in Harjamukti Village, Kecapi in Kecapi Village, and Suketduwur and Kebon Pelok in Kalijaga Village. Meanwhile, three are located in Kesambi District, namely Majasem in Karyamulya Village and Kesambi and Melati Village in Kesambi Village. The validation score percentages by the media, material, and linguist were 73.33%, 80%, and 88.57%, respectively. Furthermore, the score percentage by biology teachers and students was 93.33% and 86.2%, respectively. The overall average of the assessment results was 84.28% in the highly feasible criteria. The developed digital encyclopedia is an application that can be run on an Android smartphone. The product is suitable as a learning resource for Plantae material for tenth-grade senior high school students.

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