RESEARCH ARTICLE

# Website development on herbal plant diversity as media in *Kurikulum Merdeka*

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Abstract: Local wisdom which is the theme of the project to strengthen the character of Pancasila in the Merdeka Curriculum includes the fading of ancestral culture such as traditional vegetable medicine. Although schools have limited resources for teaching local wisdom through books, students' preference for mobile learning requires a more flexible and practical approach, as seen from the use of Tambakboyo Reservoir's herbal diversity as website content. This research aims to determine the types of herbal plants in the Tambakboyo Reservoir and their suitability as learning media. This R&D research uses the ADDIE model which is limited to the development stage. There are 62 types of Indonesian herbal plants in Tambakboyo Reservoir. The results of reviews by material experts, media experts, practitioners, and student readability tests on the herbal plants website show that the media is declared appropriate and meets the assessment criteria and can then be continued with implementation.

**Keywords:** Herbal-plant; *Kurikulum Merdeka;* media development; Tambakboyo reservoir

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## Introduction

The project for strengthening the character of Pancasila is a co-curricular activity of the *Kurikulum Merdeka*. This project was structured with the main focus to develop the dimensions of the Pancasila student profile. The Character of Pancasila is a translation of the national education goals of the law of the Republic of Indonesia number 20 of 2003. This profile is divided into six dimensions, namely 1) faith, devotion to God Almighty, and noble character, 2) independence, 3) working together, 4) global diversity, 5) critical reasoning, and 6) creative (Kemendikbudristek, 2022). Then, each dimension is developed by educators according to the child's stage of psychological and cognitive development. Then, the project has seven activity themes, one of which is local wisdoms.

One of Indonesia's local wisdoms is knowledge regarding the use of plants as traditional medicine. This plant preparation as medicine is known as *jamu* (Isnawati & Sumarno, 2021). This preparation has been known to Indonesian people for centuries with evidence from the *Husodo* (Javanese) and *Usadha* (Bali) palm leaf manuscripts (Margarethy et al., 2019). Even though this traditional medicine still exists today, people's knowledge about plants that have medicinal properties is starting to decline. This is proven by research by Susanti & Mona (2021) which states that 40 out of 60 respondents have insufficient knowledge regarding the potential and benefits of mangroves as traditional medicine.

Reference sources regarding the diversity of herbal plants in Indonesia that can be used for learning in schools are still limited. There are books that display various kinds of herbal plants, but the completeness and quality of the images are still limited (Kuswanto, 2018). Apart from that, the book does not explain the use of plants based on regional/ethnic origin. Therefore, it is necessary to have learning media that is in accordance with the current curriculum. Sari & Suswanto (2017) stated that the website has the advantage that it can be accessed online from various platforms so that it is more flexible and can be accessed anytime and anywhere and material can be downloaded according to student needs.

Biology learning and the use of the environment as a learning resource are closely related (Mulia & Jufri, 2019). Utilizing the surrounding environment as a learning resource can increase student motivation and provide a new learning atmosphere (Andarias et al., 2022). Apart from that, students can also empower

the environment while maintaining its preservation.
Tambakboyo Reservoir is located downstream of the confluence of the Tambakboyo River and Buntung River with the inundation area covering Wedomartani Village, Kapanewon Ngemplak and Condongcatur Village, Kapanewon Depok in Sleman, The Special Region of Yogyakarta Province. The area of this reservoir reaches 7.8 ha (KemenPUPR, 2021). This reservoir is also located near junior and senior high schools in Yogyakarta, as seen on Google Maps. Therefore, the reservoir hosts various activities such as jogging, fishing, relaxation, rowing practice, and research. However, research on Tambakboyo Reservoir is currently limited to water quality and soil sediment availability. Despite having a diverse range of plants, the local residents and managers are not familiar with the plant species. It is regrettable that the full potential of the reservoir is not being utilized to the optimum extent.
Based on this, the Tambakboyo Reservoir has the potential for plant diversity which can be used as teaching materials, especially traditional medicine. Then, it was developed into a learning media in the form of a website so that it could be used in the project for strengthening the character of Pancasila, namely local wisdoms.

## Method

The research conducted follows the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model for research and development. However, researchers only limit it to the development stage. This is due to limited time and researcher abilities. All research stages were carried out in January – August 2023. In the analysis stage, researchers conducted exploratory research in the Tambakboyo Reservoir area to analyse the potential diversity of medicinal plants used by the Indonesian people. After that, the researcher designs the website learning media in the design stage.
In the development stage, researchers carried out validation consisting of 1 media expert, 2 material expert, 1 practitioner, and readability tests for students at State Senior High School (SHS) 1 Godean, totalling 33 class X students. The research data collection instrument used a material expert validation sheet with the Guttman scale for material experts with alternative answers: "yes" and "no". Meanwhile, the media expert validation sheet, teacher assessment sheet and student readability test questionnaire use a Likert scale with alternative answers, namely: Strongly Agree, Agree, Disagree, and Strongly Disagree. The Guttman scale is used to assess the correctness of the concept of a material, namely medicinal plants. Meanwhile, the Likert scale is used to evaluate respondents' attitudes, opinions and perspectives in using the media.
Data analysis techniques resulting from assessments by material experts, media experts, practitioners and respondents use the following Formula 1:

$$Score\ (\%) = \frac{Number\ of\ scores\ obtained}{Maximum\ number\ of\ scores} x100\% \quad (1)$$

Then, the results obtained according to the Guttman scale are interpreted are show in Table 1. Meanwhile, the results obtained according to the Likert scale are interpreted are show in Table 2.

Table 1. Interpretation of assessment results based on the Guttman scale.

| Percentage Range (%) | Category |
|---|---|
| 51 - 100 | Good |
| 0 - 50 | Bad |

Table 2. Interpretation of assessment results based on a Likert scale.

| Percentage Range (%) | Category |
|---|---|
| 81.25 ≤ score < 100 | Very Good |
| 62.50 ≤ score < 81.25 | Good |
| 43.75 ≤ score < 62.50 | Bad |
| 25 ≤ score < 43.75 | Very Bad |

## Results and Discussion

This analysis stage is divided into six parts, namely: (1) analysis of the potential results of medicinal plant diversity in Tambakboyo Reservoir, (2) curriculum, (3) instructional, (4) needs, (5) availability of technology, and (6) characteristics learners. The results of the analysis of the potential diversity of medicinal plants in Tambakboyo Reservoir, obtained 62 species that have medicinal properties and are used by people in Indonesia. The list of plants can be seen in Table 3. The data is then compiled into teaching materials which include common names, regional names, scientific names, taxonomy, morphology, content and utilization and then developed into website-based learning media.

Table 3. List of medicinal plants found in Tambakboyo Reservoir

| Treated disease[a] | Plant parts[b] | Scientific name | Indonesian Name |
|---|---|---|---|
| Diabetes | L | *Ruellia tuberosa* L | Kencana Ungu |
| | L | *Catharanthus roseus* (L.) G. Don | Tapak Dara |
| | L | *Ageratum conyzoides L.* | Bandotan |
| | L | *Chromolaena odorata* (L.) R.M. King & H. Rob | Rumput Minjangan |
| | L | *Tridax procumbens* L | Gletang |
| | L | *Muntingia calabura* L | Kersen |
| | Fr | *Leucaena leucocephala* (Lam.) de Wit | Lamtoro |
| | L | *Passiflora foetida* L | Rambusa |
| | Rh | *Zingiber zerumbet* (L.) Roscoe ex Sm | Lempuyang |
| Asthma | L | *Asystasia gangetica* subsp. *micrantha* (Nees) Ensermu | Rumput Israel |
| | Fl | *Gomphrena globosa* L | Bunga Kenop |
| | L | *Piper sarmentosum* Roxb | Karuk |
| Boil | WP | *Amaranthus spinosus* L | Bayam Duri |
| | L | *Physalis angulata* L | Ciplukan |
| Gastroenteritis | B | *Terminalia catappa* L | Ketapang |
| Diarrhea | L | *Acalypha indica* L | Cakar Kucing |
| | L | *Psidium guajava* L | Jambu Biji |
| Edema | L | *Celosia argentea* L. | Boroco |
| Malaria | B | *Alstonia scholaris* (L.) R. Br | Pule |
| | L | *Calotropis gigantea* (L.) W.T. Aiton | Biduri |
| | Se | *Areca catechu* L | Pinang |
| | L | *Carica papaya* L | Pepaya |
| | WP | *Sieruela rutidosperma* (DC.) Roalson & J.C. Hall | Maman Ungu |
| | L | *Coccinia grandis* (L.) Voigt | Timun Tikus |
| | L | *Mimosa pudica* L | Putri Malu |
| | L | *Swietenia mahagoni* (L.) Jacq | Mahoni |
| | Fr | *Morinda citrifolia* L | Mengkudu |
| Toothache | L | *Bidens pilosa* L | Ajeran |
| | L | *Piper aduncum* L. | Sirih Hutan |
| | S | *Ricinus communis* L | Jarak |
| Sore eyes | Fl | *Hippobroma longiflora* (L.) G. Don | Bunga Bintang Lima |
| | St | *Cheilocostus speciosus* (J. Koenig) C.D. Specht | Pacing |
| | L | *Cosmos caudatus* Kunth | Bunga Cosmos |
| Headache | L | *Leea indica* (Burm.fil.) Merr | Girang |
| | Rh | *Curcuma xanthorrhiza* D. Dietr. | Temulawak |
| Cough | WP | *Cyanthillium cinereum* (L.) H. Rob | Sawi langit |
| | L | *Ipomoea quamoclit* L | Rincik bumi |
| | WP | *Cymbopogon citratus* (DC.) Stapf | Serai |
| | L | *Plectranthus scutellarioides* (L.) R. Br. | Miana |
| | L | *Urena lobata* L | Pulutan |
| Ulcer | L | *Eclipta prostrata* (L.) L. | Urang – Aring |
| Pruritus | L | *Euphorbia hirta* L | Patikan Kebo |
| Wound | L | *Mikania micrantha* Kunth | Sembung rambat |
| | L | *Sphagneticola trilobata* (L.) Pruski | Wedelia |
| Motion sickness | L | *Ficus septica* Burm.fil. | Awar – Awar |
| Fever | L | *Cnidoscolus aconitifolius* (Mill.) I.M. Johnst | Chaya |
| | Se | *Psophocarpus tetragonolobus* (L.) DC | Kecipir |
| | WP | *Oldenlandia corymbosa* L. | Rumput Mutiara |
| | L | *Datura metel* L | Kecubung |
| Weight loss | L | *Euphorbia heterophylla* L | Kate Mas |
| Gout | L | *Macaranga tanarius* (L.) Müll.Arg | Mara |
| Myalgia | L | *Gliricidia sepium* (Jacq.) Kunth | Gamal |
| | L | *Citrus hystrix* DC. | Jeruk Purut |
| Hypertension | R | *Sida rhombifolia* L | Sidaguri |
| | L | *Artocarpus altilis* (Parkinson) Fosberg | Sukun |
| | Fr | *Oxalis barrelieri* L | Calingcing |
| | WP | *Peperomia pellucida* (L.) Kunth | Sirih Cina |
| Kidney illness | B | *Gmelina arborea* Roxb. ex Sm. | Jati Putih |
| | WP | *Eleusine indica* (L.) Gaertn. | Rumput Belulang |
| | L | *Gnetum gnemon* L | Melinjo |
| Ringworm | L | *Ficus hispida* L. fil | Luwingan |
| Cholesterol | L | *Impatiens balsamina* L. | Pacar Air |

[a](Adriadi et al., 2022; Daud & Manu, 2021; Demita et al., 2021; Elfrida et al., 2021; Gunarti et al., 2021; Gunawan et al., 2022; Haba et al., 2022; Huda et al., 2022; Jamun et al., 2020; Kissinger et al., 2021;

Leksikowati et al., 2020; Maharani et al., 2021; Manurung et al., 2016; Nasution et al., 2021; Ngineikon et al., 2022; Qasrin et al., 2020; Rahmawati & Hidajati, 2017; Ricky et al., 2019; Risnawati & Nurhayatina, 2022; Kemenkes, 2015; Rizki et al., 2019; Rupilu & Watuguly, 2018; Slamet & Andarias, 2018; Sulastri et al., 2021; Suryatinah et al., 2020; Tabeo et al., 2019; Taek et al., 2018; Tima et al., 2020; Wae et al., 2022; Wijana & Rahmawati, 2020; Yansip et al., 2017)
[b]B= Bark, Fl = Flower, Fr=Fruit, L=Leaves, R=Root, Rh= Rhyzome, S=Sap, Se=Seed, St=Stem, WP= Whole Plants

Meanwhile, curriculum analysis and analysis of student characteristics are based on literature studies. Curriculum analysis is based on the theme of local wisdom in the project to strengthen the character of Pancasila. The themes in that project were developed based on priority issues in the 2020-2035 National Education Roadmap in the Kurikulum Merdeka. One of Indonesia's local wisdoms is knowledge regarding the use of plants as traditional medicine. Since the time of the Majapahit Kingdom, the people have known herbal preparations, such as *kunyit asam* (turmeric and tamarind), *beras kencur* (aromatic ginger and rice), *cabe puyang* (java long pepper and bitter ginger), *pahitan* (bitter), *kunci suruh* (fingerroot and betel), *kudu laos* (noni and galangal), *uyup – uyup*, and *sinom* (from young tamarind leaves) which shows a representation of the symbol of "the Sun of Majapahit" (Isnawati & Sumarno, 2021). Although the use of plants as medicine is still maintained today, knowledge about herbal plants is increasingly fading. This is due to modernization so that people tend to use ready-to-use herbal medicines. This lack of knowledge is also proven by research by Susanti & Mona (2021) that 40 out of 60 respondents (local communities) have insufficient knowledge regarding the potential and benefits of mangrove plants as traditional medicine. Therefore, knowledge about the diversity of medicinal plants is important to teach in schools.

Then, instructional analysis is based on the competencies expected in the *Kurikulum Merdeka*, namely that students are expected to have competencies related to internal factors (identity, ideology, and ideals of Indonesia) and external factors (industrial revolution), namely becoming superior and productive citizens in this Century 21$^{st}$. These factors are formulated into six key dimensions, one of which is critical reasoning. It is important to teach critical reasoning in schools so that students get used to thinking critically and do not carelessly accept information or make comments. This is because teenagers like to give criticism in the news comments column where the truth of the news is not yet known, giving rise to hoaxes which end up giving rise to hate speech and division (Rahmadhany et al., 2021). Therefore, one of the achievements of the critical reasoning phase is that students are able to make accurate decisions by identifying and clarifying ideas and information obtained from various relevant sources and prioritizing the most relevant ideas from the results of analytical clarification. This achievement is aimed at phase E (senior high school) in the element of obtaining and processing information and ideas.

The needs analysis is based on technological developments and the availability of learning media that is in accordance with the *Kurikulum Merdeka*. Technological developments are currently entering the era of society 5.0 which places greater emphasis on the role of humans as the centre of civilization by utilizing digital technology in various sectors, especially education. When studying, students use smartphones for 1-12 hours per day to look for references because finding learning materials is easier and more interesting (Yunus & Fransisca, 2020). Apart from that, learning media regarding medicinal plants is still limited to books. The weakness of using this book is that it is less practical because the more complete the content, the heavier the book, the less complete the pictures and the less flexible it is. Therefore, developing website media as a learning medium is a good solution because it has advantages, such as flexible use, can be accessed anywhere and anytime, and is practical.

Then, the analysis of technology availability is based on the availability of electronic devices in schools. SHS 1 Godean has adequate electronic devices and internet access. This is important to do because the website requires a network that is strong enough to access plant images. The electronic devices used must be adequate, such as smartphones/tablets/personal computers. For smartphones, it is expected to have an Android or iOS version.

Analysis of student characteristics refers to age, habits and current conditions. Senior high school is estimated to be aged 15 – 18 years or adolescence, at which age he can analyse abstract ideas to provide objective solutions to existing problems. At this time, teenager tend to prefer to use something practical and flexible in learning. Apart from that, teenagers are used to getting information from the internet because it is easy to access, economical and light.

At the design stage, concepts and frameworks were prepared, website creation and validation instrument design were carried out. Preparing the concept and framework, the researcher sketched the appearance of the website with Canva. Then, the website was created using WordPress with the address https://www.herbal-plants.com. The main pages on this website are: (1) the home page (main page) which contains previews of other pages on the website; (2) the directory page contains a list of the contents of the species page, totalling 62 species; (3) a species page that explains the species from its common name, scientific name to regional name. Equipped with taxonomy, morphology, chemical content and use of these plants based on 76 tribes in Indonesia. Then, there is a photo documentation

of the species to complement the material discussed along with a description. The reference sources listed are linked to the original sources so they can be checked by users; (4) on the quiz page there are two types of quizzes, namely guess the benefits and species. Guess the benefits is aimed at guessing the benefits or use of the plant as a particular medicine. Meanwhile, guess the species is aimed at guessing the type of species being asked; (5) the glossary page displays a list of difficult terms on the web along with explanations, (6) the about us page displays the researcher's profile, thanks to people who have helped the researcher's research, research location, and the purpose of creating the website, and (7) Our contact page is a connecting page between users and developers. There is a form that can be sent directly to the developer so that users can submit their criticism and suggestions. Apart from that, there are thanks to users as a form of appreciation for users who have used the website and conveyed their aspirations. The quiz page of the website can be seen in Figure 1.

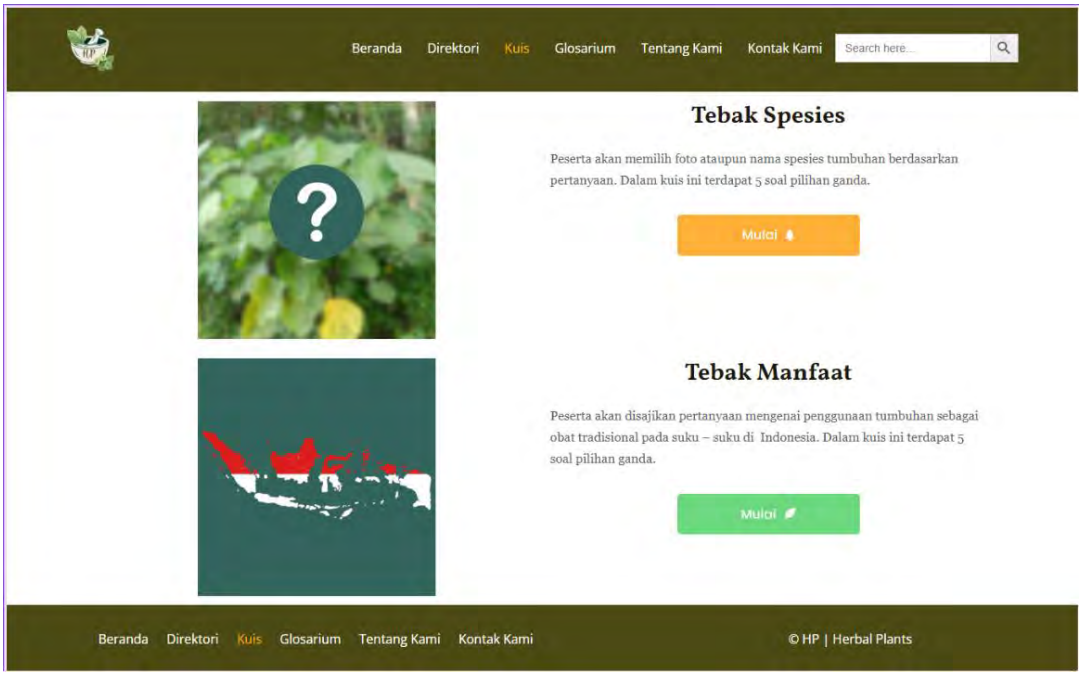

Figure 1. Quiz page of herbal plants website

After that, student performance sheet was created so that learning media could be used in this project. The dimension developed in this student performance sheet is critical reasoning with the achievement of the phase where students are able to make accurate decisions by identifying and clarifying ideas and information obtained from various relevant sources as well as prioritizing the most relevant ideas from the results of analytical clarification. Then, designing instruments in the form of validation sheets for material experts, media experts and biology teachers, as well as student response questionnaires for readability testing. The Guttman scale is used for material expert validation sheets. Meanwhile, the Likert scale is used for media expert validation sheets, biology teachers and student response questionnaires. At development stage, it is carried out to assess the suitability of the learning media that has been created and improvements to the website are made. The stages are divided into six, (1) namely material expert review, (2) media expert review, (3) first revision, (4) practitioner review, (5) student readability test, and (6) final revision. The aspects assessed by material experts are material and language. Then, there is a truth sheet for the website content concept. The scale used is the Guttman scale to obtain the truth of the content. The material review was carried out by two material expert lecturers who have competence in the fields of plant diversity and morphology as well as the content and use of traditional medicine. The assessment of chemical content and efficacy is only carried out by a second material expert. This is because this expert specializes in the field of medicinal plants. Meanwhile, the first material expert is someone who is an expert in the field of plant diversity and morphology. The assessment results can be seen in Table 4, Table 5 and Table 6. Based on the assessment of material experts on the material and language aspects, a score of 100% was obtained. Meanwhile, the results of assessing the correctness of concepts including classification, morphology, chemical content and use of plants as herbal medicines obtained a score of 100%. Based on this, it can be stated that the content of the website can be trusted, and the level of accuracy is good so that it can be used as learning media in schools.

Table 4. Results of material expert validation assessment

| No | Aspect | Result of Validation | | Average Score | Maximum score | (%) | Criteria |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | | | | |
| 1 | Material | 14 | 14 | 14 | 14 | 100 | Good |
| 2 | Linguistic | 6 | 6 | 6 | 6 | 100 | Good |

Table 5. Results of assessing the correctness of plant taxonomy and morphology by material experts

| No | Aspect | Result of Validation | | Average Score | Maximum score | (%) | Criteria |
|---|---|---|---|---|---|---|---|
| | | 1 | 2 | | | | |
| 1 | Taxonomy | 62 | 62 | 62 | 62 | 100 | Good |
| 2 | Morphology | 62 | 62 | 62 | 62 | 100 | Good |

Table 6. The results of the assessment of the correctness of the chemical content and benefits of plants

| No | Aspect | Result of Validation | Average Score | Maximum score | (%) | Criteria |
|---|---|---|---|---|---|---|
| 1 | Chemical content | 62 | 62 | 62 | 100 | Good |
| 2 | Advantages | 62 | 62 | 62 | 100 | Good |

Media experts review aspects of material, language, application, design and appearance. The scale used is a Likert scale. The average percentage of material aspects is 95.83% in the very good category. This shows that the general display of the organization's website, material accuracy, library sources and additional materials are of very good quality. The average percentage for the language aspect was 90% in the very good category. This value shows that the use of terms is not difficult, the use of language is straightforward, consistent, easy to understand, and in accordance with General Guidelines for Indonesian Spelling/*Pedoman Umum Ejaan Bahasa Indonesia* (PUEBI). The average percentage of application aspects obtained was 91.67% in the very good category. This shows that the website can be accessed and operated on electronic devices such as smartphones, tablets and personal computers. The website also doesn't experience problems/errors and there are complete features that make it easy to use. Furthermore, the design and appearance aspect obtained an average percentage of 96.87% in the very good category because the website has a good appearance and image quality so that it can stimulate students to learn and improve understanding as well as a comfortable and attractive page layout. The assessment results can be seen in Table 7.

Table 7. Results of media expert assessments

| No | Aspect | Result of Validation | Maximum score | (%) | Criteria |
|---|---|---|---|---|---|
| 1 | Material | 23 | 24 | 95.83 | Very Good |
| 2 | Linguistic | 18 | 20 | 90 | Very Good |
| 3 | Application | 22 | 24 | 91.67 | Very Good |
| 4 | Design and appearance | 31 | 32 | 96.87 | Very Good |

After these two stages, the first revision is carried out. Revisions are carried out in accordance with suggestions and input provided by material and media experts when assessing the Herbal Plants website. The next stage is an assessment by practitioners (biology teachers) and a student readability test. Aspects assessed by practitioners (biology teachers) are material, display, language, application, design and appearance. The scale used is a Likert scale. The material aspect received a percentage of 87.5% (very good). This can be stated that the material on the website which is equipped with student performance sheet is in accordance with the scope of the *Kurikulum Merdeka*, especially in strengthening character of Pancasila project with the theme of local wisdom. Then, the display aspect gets a percentage of 100% (very good). This means that the material has been prepared concisely, clearly and systematically and supported by appropriate photos. Apart from that, the grammar on the website is correct and in accordance with Indonesian language rules, does not have double meaning (ambiguous) the use of words/terms is consistent, and is easy to understand. This is proven by the percentage score for the language aspect, namely 87.5% (very good). The application aspect received a score of 100% (very good), which means that it is easy to use in terms of operation, there are no errors, it can be used on various platforms, and there is student performance sheet that can help students learn well. The design and appearance aspects received a percentage of 100% (very good) so that it can be stated that the general appearance, selection of background, text and image quality are correct and good. Diagrams of the results of practitioner assessments can be seen in Table 8.

Table 8. Practitioner assessment results (biology teacher)

| No | Aspect | Result of Validation | Maximum score | (%) | Criteria |
|---|---|---|---|---|---|
| 1 | Material | 42 | 48 | 87.5 | Very Good |
| 2 | Display | 16 | 16 | 100 | Very Good |
| 2 | Linguistic | 21 | 24 | 87.5 | Very Good |
| 3 | Application | 32 | 32 | 100 | Very Good |
| 4 | Design and appearance | 28 | 28 | 100 | Very Good |

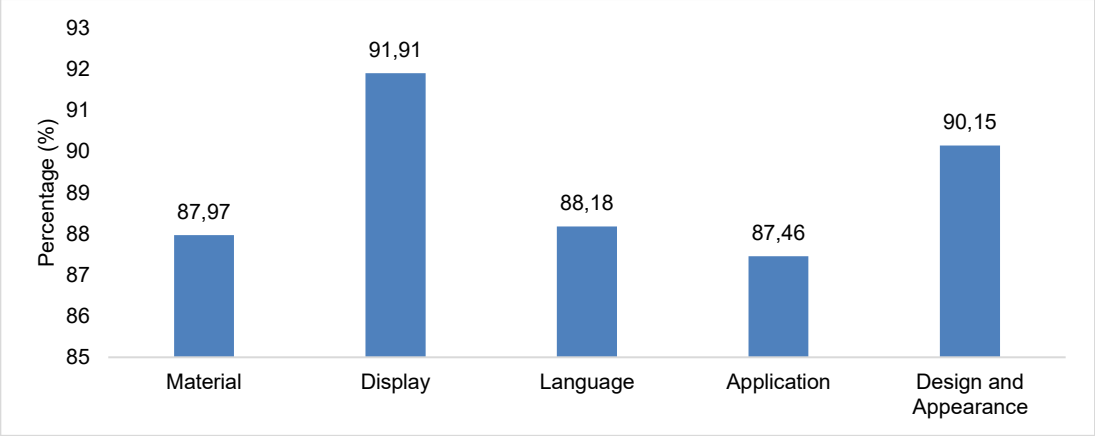


Figure 2. Diagram of student response results

Student readability tests were carried out to see student responses to the Herbal Plants website that had been prepared. The instrument used is a questionnaire with a Likert scale. The location for the readability test was carried out at SHS 1 Godean in tenth grades with a total of 33 students. SHS 1 Godean was chosen because it develops the same theme as the one being developed, namely local wisdom. Aspects of student responses are material, display, language, application, design and appearance. The material aspect obtained a percentage of 87.97% in the very good category. This states that the level of relevance of the material to the achievement of the phase is good because the material is easy to understand, improves student learning, adds insight, and makes it easier to find information about traditional Indonesian medicinal plants. Then, the display aspect obtained a percentage of 91.91% (very good), which means that the presentation of the material has been presented coherently and clearly, and the images are in accordance with the material and complete. The language aspect obtained a percentage of 88.18% (very good), which means the language is easy to understand, has no double meaning, and the terms used are not difficult. Furthermore, the application aspect obtained a percentage of 87.46% (very good). It can be stated that the ease of use of the website is good in terms of accessing it on various platforms, there are no errors, the website features are complete, and there is student performance sheet which can help students in learning. Then, the design and appearance aspects received a percentage of 90.15% (very good), which means that the general appearance, image quality and choice of background and type of font are appropriate and attractive. The diagram of student readability test results can be seen in Figure 2. After this stage, a final revision was carried out based on suggestions from practitioners and students.

## Conclusion

Based on the results of exploration in Tambakboyo Reservoir, 62 plant species were found which are used as traditional Indonesian medicine. Based on the results of reviews by material experts, media experts, practitioners (biology teachers), and student readability tests on the herbal plants website, it shows that the media is declared to have met the assessment criteria which can then be continued for implementation.

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## Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

## Author Contributions

**A. Madrin:** Methodology; Writing – original draft, Writing – review and editing. Data analysis; Writing – review and editing. **R. Ratnawati:** Methodology; Writing – original draft, Writing – review and editing. Data analysis; Writing – review and editing

## References


Adriadi, A., Asra, R., & Solikah, S. (2022). Studi etnobotani tumbuhan obat masyarakat Kelurahan Kembang Paseban Kecamatan Mersam Kabupaten Batanghari. *Jurnal Belantara*, *5*(2), 191–209. https://doi.org/10.29303/JBL.V5I2.881

Andarias, S. H., D, Y., & Ardyati, D. P. I. (2022). Potensi tumbuhan lokal sebagai sumber belajar biologi. *JEC (Jurnal Edukasi Cendekia)*, *6*(1). https://doi.org/10.35326/jec.v6i1.2166

Daud, Y., & Manu, T. S. N. (2021). Etnobotani tumbuhan obat oleh masyarakat Desa Pukuafu Kecamatan Landu Leko Kabupaten Rote Ndao. *Indigenous Biologi : Jurnal Pendidikan dan Sains Biologi*, *4*(3), 101–111. https://doi.org/10.33323/INDIGENOUS.V4I3.270

Demita, D., Wahyuningtyas, R. S., & Silalahi, M. (2021). Studi etnobotani kuning oleh etnis Karo di Desa Ujung Bandar, Kecamatan Salapian, Kabupaten Langkat, Sumatera Utara. *JOURNAL of Biotechnology and Conservation in Wallacea*, *1*(1), 17–30. http://repository.uki.ac.id/6521/1/StudiEtnobotaniKuning.pdf

Elfrida, Tarigan, N. S., & Suwardi, A. B. (2021). Ethnobotanical study of medicinal plants used by community in Jambur Labu Village, East Aceh, Indonesia. *Biodiversitas Journal of Biological Diversity*, *22*(7), 2893–2900. https://doi.org/10.13057/BIODIV/D220741

Gunarti, N. S., Fikayuniar, L., & Hidayat, N. (2021). Studi etnobotani tumbuhan obat di Desa Kutalanggeng dan Kutamaneuh Kecamatan Tegalwaru Kabupaten Karawang Jawa Barat. *Farmasetika*, *6*(1), 14–23. http://journal.unpad.ac.id/farmasetika/article/view/36668/16768

Gunawan, I., Arbiastutie, Y., Yusro, F., & Mariani, Y. (2022). Pemanfaatan tumbuhan obat oleh battra (pengobat tradisional) pada tiga dusun di sekitar hutan Tembawang Desa Sotok Kabupaten Sanggau. *Jurnal Serambi Engineering*, *7*(3), 3421–3431. https://doi.org/10.32672/JSE.V7I3.4442

Haba, F. S., Purnama, M. M. E., & Mau, A. E. (2022). Keanekaragaman jenis dan pemanfaatan tumbuhan obat di hutan penelitian Bu'at So'e, Kecamatan Mollo Selatan, Kabupaten Timor Tengah Selatan, Provinsi Nusa Tenggara Timur. *Wana Lestari*, *6*(01), 187–198. https://ejurnal.undana.ac.id/index.php/warnalestari/article/view/8041

Huda, M., Sulistiyowati, T. I., Primandiri, P. R., & Santoso, A. M. (2022). Kajian etnobotani tanaman obat di Desa Jugo Kecamatan Mojo Kabupaten Kediri. *Prosiding Seminar Nasional Kesehatan, Sains Dan Pembelajaran*, *2*(1), 493–502. https://doi.org/10.29407/SEINKESJAR.V2I1.3065

Isnawati, D. L., & Sumarno. (2021). Minuman jamu tradisional sebagai kearifan lokal masyarakat di Kerajaan Majapahit pada Abad Ke-14 Masehi. *AVATARA: E-Journal Pendidikan Sejarah*, *11*(2). https://ejournal.unesa.ac.id/index.php/avatara/article/view/42175

Jamun, R., Hendra, M., & Hariani, N. (2020). Keanekaragaman tumbuhan obat di suku Manggarai Kecamatan Ndoso Kabupaten Manggarai Barat Nusa Tenggara Timur (NTT). *Jurnal Pendidikan Matematika dan IPA*, *11*(2), 271–299. https://doi.org/10.26418/JPMIPA.V11I2.40810

Kemendikbudristek RI. (2022). Panduan pengembangan *Projek Penguatan Profil Pelajar Pancasila*. Kementrian Pendidikan dan Kebudayaan, 1-108. https://kurikulum.kemdikbud.go.id/file/1679308669_manage_file.pdf

Kemenkes RI. (2015). *Riset khusus eksplorasi pengetahuan lokal etnomedisin dan tumbuhan obat berbasis komunitas di indonesia Etnis Osing Provinsi Jawa Timur*. https://simdos.unud.ac.id/uploads/file_penelitian_1_dir/1bd0889010273d48dccd159a2b6c30ec.pdf

Kementrian PUPR. (2021, June 16). *Tambakboyo Reservoir - Balai Besar Wilayah Sungai Serayu Opak*. https://sda.pu.go.id/balai/bbwsserayuopak/projects-item/embung-tambakboyo/

Kissinger, K., Abdullah, A., Fitria, A., & Mnp, R. (2021). Proceedings Series on Physical & Formal Sciences, Volume 2 Prosiding Seminar Nasional Fakultas Pertanian dan Perikanan dengan Judul Pemanfaatan Tumbuhan Hutan sebagai Bahan Pengobatan Tradisional oleh Masyarakat Suku Dayak Meratus Kalimantan Selatan. *Proceedings Series on Physical & Formal Sciences*, *2*, 152–159. https://doi.org/10.30595/pspfs.v2i.191

Kuswanto, Joko. (2018). Media pembelajaran berbasis web pada mata pelajaran biologi kelas X. *Jurnal Perspektif Pendidikan, 12*(2), 11-20. https://doi.org/10.31540/jpp.v12i2.203

Leksikowati, S. S., Oktaviani, I., Ariyanti, Y., Akhmad, A. D., & Rahayu, Y. (2020). Medicinal plant ethnobotany in local communities of Lampung Tribe in West Lampung Regency. *BIOLOGICA*

*SAMUDRA*, *2*(1), 34–53. https://doi.org/10.33059/JBS.V2I1.2297

Maharani, A. S., Eva Tavita, G., Mariani, Y., & Yusro, F. (2021). Keanekaragaman jenis tumbuhan obat yang dimanfaatkan oleh pengobat tradisional (Battra) Suku Dayak Mahap dan Suku Melayu di Desa Tembesuk Kabupaten Sekadau. *Jurnal Serambi Engineering*, *6*(4), 2256–2269. https://doi.org/10.32672/JSE.V6I4.3469

Manurung, A., Afifuddin, Y., & Marpaung, L. (2016). Eksplorasi tumbuhan obat di hutan lindung Lumban Julu Kecamatan Lumban Julu Kabupaten Toba Samosir. *Peronema Forestry Science Journal*, *5*(3), 65–70. https://jurnal.usu.ac.id/index.php/PFSJ/article/view/15619

Margarethy, I., Yahya, Y., & Salim, M. (2019). Kearifan lokal dalam pemanfaatan tumbuhan untuk mengatasi malaria oleh pengobat tradisional di Sumatera Selatan. *Journal of Health Epidemiology and Communicable Diseases*, *5*(2), 40–48. https://doi.org/10.22435/jhecds.v5i2.2088

Mulia, A., Jufri, M, & Syamsiah, S. (2019). Pengembangan ensiklopedia tumbuhan obat berbasis potensi lokal di Daerah Sinjai Sebagai Sumber Belajar Materi Plantae (Spermatophyta). *Prosiding Seminar Nasional Biologi VI*. https://ojs.unm.ac.id/semnasbio/article/view/10536

Nasution, J., Riyanto, R., & Gaol, M. L. (2021). Kajian etnobotani tumbuhan obat etnis Batak Toba di Desa Sipituhuta Kecamatan Pollung, Kabupaten Humbang Hasudutan, Sumatera Utara. *JURNAL BIOLOGI PAPUA*, *13*(2). https://doi.org/10.31957/jbp.1646

Ngineikon, A., Korja, I. N., Labiro, E., & Sustri, S. (2022). Pemanfaatan jenis-jenis tumbuhan sebagai obat tradisional di Desa Landonan Bebeau Kecamatan Buko Selatan Kabupaten Banggai Kepulauan. *Jurnal Warta Rimba*, *10*(3), 183–198. http://jurnal.untad.ac.id/jurnal/index.php/WartaRimba/article/view/19652

Qasrin, U., Agus Setiawan, A., Yulianty, Y., & Afif, B. (2020). Studi etnobotani tumbuhan berkhasiat obat yang dimanfaatkan masyarakat Suku Melayu Kabupaten Lingga Kepulauan Riau. *Jurnal Belantara*, *3*(2), 139–152. https://doi.org/10.29303/JBL.V3I2.507

Rahmadhany, A., Aldila Safitri, A., & Irwansyah, I. (2021). Fenomena penyebaran hoax dan hate speech pada media sosial. *Jurnal Teknologi dan Sistem Informasi Bisnis*, *3*(1). https://doi.org/10.47233/jteksis.v3i1.182

Rahmawati, M., & Hidajati, N. (2017). Isolasi dan identifikasi senyawa metabolit sekunder dari ekstrak metanol kulit batang tumbuhan mengkudu (Morinda citrifolia L.). *Journal of Chemistry*, *6*(2), 113–118. https://ejournal.unesa.ac.id/index.php/unesa-journal-of-chemistry/article/view/20942/19208

Ricky, R., Puspita, D., & Mangalik, G. (2019). Studi etnobotani tumbuhan obat di Desa Tumbang Jala – Kalimantan Tengah yang Masih dimanfaatkan Sebagai Obat Tradisional. *PROSIDING Seminar Nasional Kesehatan "Transformasi Bidang Kesehatan di Era Industri 4.0,"* 57–73. https://www.researchgate.net/publication/342802025

Risnawati, R., & Nurhayatina, R. (2022). Studi etnofarmasi tumbuhan berkhasiat obat di daerah Dusun Pahing Desa Ciawilor Kabupaten Kuningan. *Farmasi*, *4*(1), 19–28. https://ojs.stikes-muhammadiyahku.ac.id/index.php/herbapharma/article/view/233/138

Rizki, R., Nursyahra, N., & Fernando, O. (2019). Study of weeds as traditional medicinal plants used by indigenous people of West Pasaman, Indonesia. *Journal of Tropical Horticulture*, *2*(2), 81–85. https://doi.org/10.33089/JTHORT.V2I2.21

Rupilu, B., & Watuguly, T. (2018). Studi pemanfaatan tumbuhan obat tradisional oleh masyarakat Suku Oirata Pulau Kisar Kecamatan Pulau-Pulau Terselatan Kabupaten Maluku Barat Daya. *BIOPENDIX: Jurnal Biologi, Pendidikan Dan Terapan*, *5*(1), 53–64. https://doi.org/10.30598/BIOPENDIXVOL5ISSUE1PAGE53-64

Sari, H. V., & Suswanto, H. (2017). Pengembangan media pembelajaran berbasis web untuk mengukur hasil belajar siswa pada mata pelajaran komputer jaringan dasar program keahlian teknik komputer dan jaringan. *Pendidikan: Teori, Pendidikan Dan Pengembangan*, *2*.

Slamet, A., & Andarias, S. H. (2018). Studi etnobotani dan identifikasi tumbuhan berkhasiat obat masyarakat Sub Etnis Wolio Kota Baubau Sulawesi Tenggara. *Proceeding Biology Education Conference: Biology, Science, Enviromental, and Learning*, *15*(1), 721–732. https://jurnal.uns.ac.id/prosbi/article/view/33330

Sulastri, Salatalohy, A., Kamaluddin, A. K., & Ashari, R. (2021). Keanekaragaman tumbuhan obat di sekitar hutan Dusun Totodoku Kecamatan Wasile Timur Kabupaten Halmahera Timur, Provinsi Maluku Utara. *Jurnal Hutan Dan Masyarakat*, *13*(2), 92–101.

Suryatinah, Y., S., M. B., Wijaya, N. R., & Tjandrarini, D. H. (2020). Eksplorasi dan inventarisasi tumbuhan obat lokal berpotensi sebagai antiinflamasi di Tiga Suku Dayak, Kalimantan Selatan. *Buletin Plasma Nutfah*, *26*(1). https://doi.org/10.21082/blpn.v26n1.2020.p63-76

Susanti, S., & Mona, S. (2021). Pengetahuan masyarakat mengenai manfaat tanaman mangrove sebagai obat tradisional. *Jurnal Ilmu Kedokteran Dan Kesehatan Indonesia*, *1*(2), 15–24. https://journal.amikveteran.ac.id/index.php/

Tabeo, D. F., Ibrahim, N., & Nugrahani, A. W. (2019). Etnobotani Suku Togian di Pulau Malenge Kecamatan Talatako, Kabupaten Tojo Una-Una, Sulawesi Tengah. *Biocelebes*, *13*(1), 30–37. https://bestjournal.untad.ac.id/index.php/Biocelebes/article/view/12868

Taek, M. M., EW, B. P., & Agil, M. (2018). Ethnomedicinal plants used for the treatment of malaria in Malaka, West Timor. *Journal of Young Pharmacists*, *10*(2), 187–192. https://www.jyoungpharm.org/sites/default/files/JYoungPharm_10_2_187_0.pdf

Tima, M. T., Wahyuni, S., & Murdaningsih, M. (2020). Etnobotani tanaman obat di Kecamatan Nangapanda Kabupaten Ende Nusa Tenggara Timur. *Journal Penelitian Kehutanan FALOAK*, *4*(1), 23–38. https://doi.org/10.20886/JPKF.2020.4.1.23-38

Wae, V. P. S. M., Grago, J., & Ngapa, Y. D. (2022). Etnobotani masyarakat Suku Lio: Studi kasus di Desa Waturaka Kawasan Taman Nasional Kelimutu Kabupaten Ende Nusa Tenggara Timur. *Biosfer: Jurnal Biologi Dan Pendidikan Biologi*, *7*(1), 58–66. https://doi.org/10.23969/BIOSFER.V7I1.5463

Wijana, N., & Rahmawati, P. I. (2020). Short communication; medicinal plants in Ubud Monkey Forest in Bali, Indonesia: Diversity, distribution, traditional use and tourism attractiveness. *Biodiversitas Journal of Biological Diversity*, *21*(6), 2455–2461. https://doi.org/10.13057/BIODIV/D210617

Yansip, S. M., Tambaru, E., & Salam, M. A. (2017). Jenis-jenis tumbuhan berkhasiat obat tradisional di masyarakat Desa Yanim dan Braso Distrik Kemtuk Gresi Kabupaten Jayapura. *Bioma: Jurnal Biologi Makassar*, *2*(2), 1–11. https://doi.org/10.20956/BIOMA.V2I2.2027

Yunus, Y., & Fransisca, M. (2020). Analisis kebutuhan media pembelajaran berbasis android pada mata pelajaran kewirausahaan. *Jurnal Inovasi Teknologi Pendidikan*, *7*(2). https://doi.org/10.21831/jitp.v7i1.32424