ETHNOBIOLOGICAL STUDY OF THE *MANAFO* TRADITION OF THE NIAS TRIBE AS LEARNING VLOG CONTENT TO SUPPORT KNOWLEDGE ON BIODIVERSITY VALUE

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Abstrak

Indonesia merupakan negara yang kaya akan biodiversitas tetapi siswa memiliki tingkat pengetahuan nilai biodiversitas yang rendah. Upaya telah dilakukan untuk mengajarkan spesies terintegrasi *indigenous knowledge*, Manafo. Penelitian ini bertujuan untuk menganalisis spesies yang digunakan dalam Manafo dan mendeskripsikan video edukasi tentangnya. Metode penelitiannya meliputi eksplorasi lapangan dengan teknik wawancara dan dokumentasi. Hasil penelitian eksplorasi lapangan digunakan untuk membuat video edukasi. Tradisi mengunyah sirih dikenal dengan nama Manafo, yang melibatkan penggunaan lima bahan: daun sirih (tawuo), bubuk kapur (betua), gambir (gambe), tembakau (bago), dan pinang (fino). Video tersebut diunggah di YouTube dan dapat diakses melalui link https://youtu.be/jyqUbjH5IZk. Responden memberikan respon positif dan baik terhadap video edukasi Manafo. Video ini dimaksudkan untuk menunjang pengetahuan generasi muda sekaligus meningkatkan apresiasi budaya.

Kata Kunci: *video edukasi; Manafo; nilai biodiversitas; indigenous knowledge; Nias*

Abstract

I Indonesia is a country rich in biodiversity, but students' knowledge of the value of biodiversity is low. Efforts have been made to teach an integrated species of indigenous knowledge, Manafo. The research aims to analyze the species used in Manafo and describe the educational video about it. The research method involves field exploration with interviews and documentation techniques. The field exploration research results were used to create educational videos. The tradition of betel chewing is known as Manafo, which involves the use of five ingredients: betel leaves (tawuo), lime powder (betua), gambier (gambe), tobacco (bago), and areca nut (fino). The video was uploaded on YouTube and can be accessed through the link https://youtu.be/jyqUbjH5IZk. Respondents gave a positive and good response to the Manafo educational video. These videos are intended to support the knowledge of the younger generation while promoting cultural appreciation.

Keywords: *Manafo; Educational Video; Biodiversity Value; Indigenous Knowledge; Nias*

A. Introduction

Indonesia is a country with a rich biodiversity, including various plant species. Indonesia has 19,000 species of flowering plants, accounting for 8% of the world's total species of flowering plants and 9% of the total species of ferns (Pteridophytes) (Jamaluddin et al., 2019). The country is home to a total of 20,000 plant species, with 40% being endemic or native (Kusmana & Hikmat, 2015; Malik et al., 2020), enriching Indonesia's biodiversity.

Plant diversity is a topic studied by students despite the reduction of material in the Kurikulum Merdeka. In the Kurikulum Merdeka, plant diversity is included in the biodiversity material studied in class X (Keputusan Kemdikbudristek Nomor 008/H/KR/2022, 2022). Biodiversity encompasses all forms of life on Earth, from genetic to ecosystem levels (Bappenas, 2015). Biodiversity encompasses the variety of life on Earth, including plants, animals, microorganisms, genes, and ecosystems (Bappenas, 2015). Biodiversity encompasses the variety of life on Earth, including plants, animals, microorganisms, genes, and ecosystems (Gour, 2022; Kusmana, 2015). It is a crucial component of our natural resources, providing for many human needs and mitigating environmental disasters (Heydari et al., 2020).

Research studies have shown that students have a low level of knowledge about plant species. For instance, Zarisma et al. (2016) found that the most challenging aspect was classifying the plant world (62.63%). Similarly, Christanty et al. (2021) reported that students struggle with plant world material, particularly in compiling classifications and identifying general characteristics of the plant world. Furthermore, individuals, particularly the younger generation, possess limited knowledge regarding plants and their intricacies, with the exception of what is taught in school (Emilda et al., 2023).

It is important for students to have a good understanding of biodiversity as it is a key component of biology, according to the Kurikulum Merdeka Classroom learning outcomes (Kemendikbud, 2022). Therefore, it is imperative that students master the topic of biodiversity. Indonesia, being a country with rich biodiversity, makes it even more crucial for students to have a good grasp of this topic. Limited knowledge of biodiversity, particularly plant species, can affect awareness of its importance.

The limited understanding of plant and animal species can be attributed to various factors, such as students, teachers, books, teaching methods, and context (Jayanti & Susantini, 2021). Therefore, the current challenge is to teach biodiversity in biology education. Biodiversity is closely linked to indigenous knowledge or local wisdom (Gadgil et al., 1993; Toledo, 2013). Indigenous knowledge refers to local knowledge that is unique to a particular culture and is acquired by local communities through accumulated experiences that are passed down through

generations (Adam et al., 2019; Chikaire et al., 2012; Senanayake, 2006). It is an example of indigenous knowledge of the Nias Tribe that utilises biodiversity in the form of organisms in its manufacture. *Manafo* is a betel chewing tradition carried out by the Nias community to honour guests who come.

Previous research has explored *Manafo*. Hamdani (2014) wrote about *Bolanafo*, which is a betel bag. Ndruru (2020) examined the flora lexicon in *Bolanafo*, while Telaumbanua (2020) researched the cultural communication of the betel nut tradition in the Nias tribe's wedding customs. Laia (2016) conducted an ethnographic study on the tradition of eating betel during traditional Nias Tribe weddings. However, there has been no ethnobiological study of *Manafo* integrated into learning. Ethnobiology is the study of biological sciences as practiced by various societies studied by ethnologists and can be traced back to the late 19th century (Clément, 1998).

The aim of this research was to create a *Manafo* educational video through ethnobiological studies. The researchers conducted an ethnobiological study of the *Manafo* tradition and used the findings to create a vlog-style educational video. The video focuses on the species used in *Manafo* and aims to educate viewers on the importance of biodiversity in traditional rituals. The video focuses on the species used in *Manafo* and aims to educate viewers on the importance of biodiversity in traditional rituals. The video focuses on the species used in *Manafo* and aims to educate viewers on the importance of biodiversity in traditional ceremony. It is also support students' understanding of indigenous knowledge. According to Pakpahan et al. (2019), the current generation of students (Generation Z) has less knowledge of indigenous knowledge compared to the Baby Boomer generation.

B. Methods

The research method employed is field exploration or field study. This methodological approach involves observing behavior under natural conditions (Garcia & Sunderlin, 2011). The study of ethnobiological principles is used in this research method. Ethnobiology is an interdisciplinary field that deals with complex issues related to biodiversity and culture(Sobral & Albuquerque, 2016). Exploratory research was carried out at two locations in East Jakarta: the Pantekosta di Indonesia (GPdI) Siloam Church, Cililitan, where a traditional Nias wedding was taking place, and the Biology Learning Laboratory of FKIP UKI.

Data collection techniques included observation, interviews, documentation, and literature study. The traditional wedding of the Nias people at GPdI Siloam Church, Kelurahan Cililitan, Kecamatan Kramatjati, Kota Jakarta Timur, was observed through video documentation. Additionally, three key informants were interviewed, two of whom are Nias people residing in Jakarta and one residing in Nias. Ethnobiological research can investigate the

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inheritance of indigenous knowledge among indigenous people living in different regions. The interviews were conducted using open-ended questions to create a relaxed atmosphere.

The qualitative analysis of interview data involved data reduction and tabulation. To complete the missing data, literature studies were conducted by searching for articles, books, and writings on the internet using the keywords *Manafo*, *bolanafo*, and betel tradition in Nias. The results of the exploratory research were then used to create a educational video. The researcher produced the educational video in the Biology Learning Laboratory at Universitas Kristen Indonesia. **Figure 1** shows the locations.

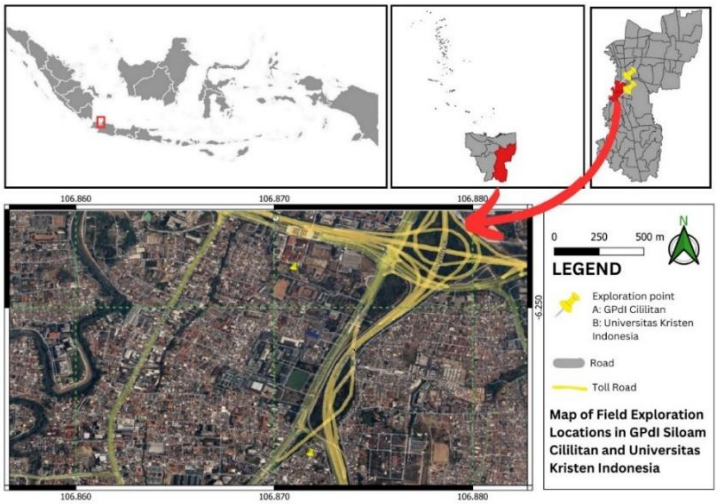

Figure 1. *Manafo* exploration research location

The educational video is shared with respondents via a YouTube link. Respondents are then asked to watch the video and complete the questionnaire. The questionnaire comprises 11 questions, which are based on modifications made to the video assessment rubric from the SMM Conference (2021). The criteria analyzed in this study include content and message, relevance, educational value, organization, grammar, delivery and narration, production and editing techniques, audio and sound, visuals and graphics, video quality and camera techniques, and creativity. The data were analyzed using descriptive statistics.

C. Results And Discussion

The Nias Archipelago, located in North Sumatra, is home to the indigenous Nias people. It comprises 132 islands, including Nias Island and several smaller islands (Gustanto et al., 2005). Out of these, only five large islands are inhabited, namely Nias Island (9,550 km²), Tanah Bala Island (39.67 km²), Tanah Masa Island (32.16 km²), Tello Island (18 km²) and Pini Island (24.36 km²) (Afif, 2010). The majority of the population in this area identifies as Protestant Christian, with the remaining population identifying as Catholic or practicing other religions (Afif, 2010; Gustanto et al., 2005; Suwartiningsih & Samiyono, 2014). The Nias people are

classified as part of the Austronesian family based on their race (Afif, 2010).

The language used by the Nias Tribe is Nias. Nias language (*Li Niha*) is a language used by the people or residents of Nias Island as a regional language (Ndruru, 2020). Nias language belongs to the Polynesian Malay family (Gustanto et al., 2005), which originated from Austronesian speakers (Afif, 2010). Every word ending in Nias language ends in a vowel, such as: "*Ama ina ba talifuso fefu, ya'e nafoda*" (ladies and gentlemen, here is our betel nut) (Ndruru, 2020).

The Nias tribe refers to themselves as *'Ono Niha*', which translates to 'child' or 'descendant' in English. The name '*Niha*' means 'human'. Nias Island is known as '*Tano Niha*', which means 'the land of humans' (Gustanto et al., 2005). The Nias tribe possesses a range of indigenous knowledge and local wisdom that has been passed down through generations. Indigenous knowledge refers to the local knowledge of specific cultures held by local communities and passed down through generations (Adam et al., 2019; Chikaire et al., 2012; Senanayake, 2006). The tradition of betel chewing is still practiced by the descendants of the Nias tribe who live outside the Nias Islands. This indigenous knowledge has been passed down from generation to generation.

Betel chewing is a traditional practice in Nias known as *Manafo*. It is a form of respect for guests who arrive at the house and is considered an important symbol. The term 'Afo sumange Ni'a' in the Nias language refers to this tradition, which has existed since time immemorial. *Manafo* is also present in ceremonies welcoming important visitors, such as government officials, community leaders, religious leaders, or other guests from outside the region (Andrian, 2019; Wulandari, 2016). This betel nut treat has been a part of Nias culture since the time of *Ono Niha*, which refers to the Nias people who descended into the world (Hamdani, 2014). The tradition teaches us to show respect to our guests.

Manafo is also performed at traditional wedding ceremonies in Nias. It is presented to respected guests as a sign of hospitality. The presentation of betel nuts is considered a gesture of sensitivity towards guests (Suharmiati et al., 2016). The tradition involves chewing betel nut, which is made up of five ingredients: betel leaves (*tawuo*), lime powder (*betua*), gambir (*gambe*), tobacco (*bago*), and areca nut (*fino*). The five ingredients are known as afo. At a welcoming ceremony, guests are traditionally offered afo before the main meal. Serving afo requires specific equipment, which is presented in **Table** 1 for the *Manafo* tradition.

Table 1. Tools for *Manafo*

No	Tools (Nias language)	Tools (English)	Description
1	*Balatu*	Knife	A tool made of sharp metal for peeling and splitting areca nuts (*fino*).
2	*Firi*	Piring	A tool used to place *afo* that will be given to guests.

The *Manafo* tradition requires plant-based ingredients as well as lime powder. These ingredients are packaged together and served to guests for chewing. Ingredients in the *Manafo* tradition can be obtained from the surrounding area. This shows that biodiversity provides direct benefits for consumption and indirect benefits for culture and rituals. The ingredients of the *Manafo* tradition are shown in **Table 2**.

Table 2. Materials and species used for *Manafo*

No	Ingredient (Nias Language)	Ingredient (English)	Species	Genus	Family	Order	Clade	Parts used
1	*Tawuo*	Betel	*Piper betle* L.	*Piper*	*Piperaceae*	*Piperales*	*Magnoliids*	Leaf
2	*Betua*	Lime powder	-	-	-	-	-	-
3	*Gambe*	Gambir	*Uncaria guianensis* (Aubl.) J.F.Gmel.	*Uncaria*	*Rubiaceae*	*Gentianales*	*Eudicots*	Leaf
4	*Bago*	Tobacco	*Nicotiana* sp.	*Nicotiana*	*Solanaceae*	*Solanales*	*Eudicots*	Leaf
5	*Fino*	Areca	*Areca catechu* L.	*Areca*	*Arecaceae*	*Arecales*	*Monocots*	Fruit

Students can learn about plant diversity, including their classification and health benefits. The results showed that there were four plant species, namely *tawuo* (*Piper betle* L.), *gambe* (*Uncaria guianensis* (Aubl.) J.F.Gmel.), *bago* (*Nicotiana* sp.), and *fino* (*Areca catechu* L.). Based on the clade grouping, it consists of 1 species of the magnoliid group, 2 species of the eudicot group, and 1 species of the monocot group. The Magnoliid clade contains 18 extant families, grouped into four orders, plus several extinct taxa, including some of the oldest fossil angiosperms (Rudall, 2023). Magnoliids are the sister group to monocots and eudicots (Shen et al., 2023). The magnoliid clade is characterized by paracytic stomata with a pair of distinct lateral auxiliary cells wrapping around the guard cell (Rudall, 2023).

Eudicots are the largest group of Angiosperms consisting of a basal grade and a large (core eudicot) clade (Forest & Chase, 2023; Ronse De Craene, 2012). They are characterised by the uniqueness of tricolpate pollen grains, or derivatives

thereof (Forest & Chase, 2023). One of the main differences between monocots and other angiosperms is the possession of a single cotyledon (compared to two cotyledons in other angiosperms) (Chase, 2004). Monocot leaves are often long and narrow, with straight parallel veins and the stems are largely unbranched (Perner & Michael, 2020).

Betel (*Piper* sp.) is a plant that grows on vines or leans against other tree trunks in tropical climates and can reach a height of 15 meters (Sarjani et al., 2017). Betel leaf (*Piper betle* L.) is known as a traditional leaf for welcoming guests in combination with tobacco, lime, gambir, and areca nut (Amin et al., 2022). Betel leaf is a traditional medicinal plant closely associated with oral health because it contains phenolic *propanoid* compounds, tannins, and essential oils consisting of *betelfenol*, *cavicol*, *estragol*, *augenol*, and *carvacol* (Sayekti et al., 2022).

Lime powder, or *kapur sirih*, is made from limestone or limestone deposits soaked in water for a week (Sadewo et al., 2018; Sekar, 2021). It is called *kapur sirih* because this lime is often used as an ingredient for *menyirih* (chewing *afo*) (Sadewo et al., 2018). Lime powder contains calcium hydroxide, or $Ca(OH)_2$ (Suprayitno et al., 2021). This lime deposit contains calcium, which is believed to be beneficial for dental and bone health (Gede Sutana et al., 2021). The amount of lime used should not be excessive, just a little (Sekar, 2021)

Gambir (*Uncaria guianensis* (Aubl.)) is a plant of the genus Uncaria in the family Rubiaceae and contains pharmacological compounds (Mahendra & Azhar, 2022). Gambir sap contains catechins (Kristina et al., 2016; Mahendra & Azhar, 2022; Sari & Deynilisa, 2019). Catechins are one of the secondary metabolites of plants with many phenolic groups (Kristina et al., 2016). Catechins are antimicrobial agents that can be used in patients with gingivitis (Sari & Deynilisa, 2019).

Tobacco (*Nicotiana* sp.) has a hairy stem surface (*pilosus*) and flowers with five petals arranged like a bell (Silalahi, 2015). Tobacco plants can be cultivated in tropical and subtropical climates, and the life cycle of tobacco is annual or less than one year (Ramadhanti et al., 2023). Tobacco plants are known to contain several antibacterial compounds, namely nicotine alkaloids, flavonoids (*phenols*), and essential oils (Gede Sutana et al., 2021; Khasanah & Nastiti, 2021).

Areca nut (*Areca catechu* L.) is a plant of the *Arecaceae* family or palms that has characteristics of a plant height of 15–25 meters with upright stems (Sagrim & Soekamto, 2019). Areca seeds function as a medicine for worms, toothache, flu, wounds, scabies, diphtheria, mouth ulcers, diarrhea, pain, and sex drive enhancers (Kementan, 2020). The positive impact of consuming areca nuts is to overcome microbial growth, have anti-*shizophrenia*, be anti-inflammatory, and improve memory (Silalahi, 2020). The results of phytochemical screening of areca nut ethanol extract contain alkaloids, terpenoids, and flavonoids (Djohari et al.,

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2019). Equipment and materials for *Manafo* are presented in **Figure 2**.

Figure 2. Tools and ingredients for the *Manafo* tradition. (A) *Balatu;* (B) *Firi;* (C) *Tawuo;* (D) *Betua*; (E) *Gambe*; (F) *Bago*; (G) *Fino*

The *Manafo* process consists of six stages. These stages start with preparing the ingredients, making the afo, and chewing the afo. The process of making an afo is usually done by the receptionist and given to the guest. Usually, those who make an afo are mothers or married women. The *Manafo* process is presented in **Table 3.**

Table 3. The *Manafo* process

No	Stage	Description
1	*Sifofona, latihoi guli wino*	The areca nut is peeled off its skin, divided into several parts, and then set aside.
2	*Labagi ma lasika dawuo*	The cleaned betel leaves are divided into two parts.
3	*Famagule betua ba dawuo*	Lime is applied to the divided betel leaf. It is usually allowed on the lower part of the leaf surface.
4	*Bulu gambe la be'e ba mbulu dawuo*	The gambier leaves are placed on top of the chalk that has been applied to the betel leaves. The leaves are then folded so that the gambier and betel leaves are inside the fold.
5	*Dawuo, betua, gambe lafanigaolo bala be'e fino*	The betel leaves, lime, and gambir leaves are rolled together to form a ring-like sphere with an areca nut in the center.
6	*Femanga afo*	*Afo* can be served with tobacco.

The results of the *Manafo* research have been turned into a educational video to teach *Manafo* to students. The educational video is entitled "Nias *Manafo* Tradition as a Biodiversity Topic Learning." The video is available on YouTube at https://youtu.be/jyqUbjH5IZk. The video is 13 minutes, 40 seconds long and consists of three main parts, namely the opening, the video content, and the closing. The opening of the video contains a brief explanation of *Manafo* and the Nias tribe, the content of the video in the form of ethnobiological research studies on *Manafo*, and the closing part of the video in the form of video conclusions. Screenshots of the video are shown in **Figure 3.**

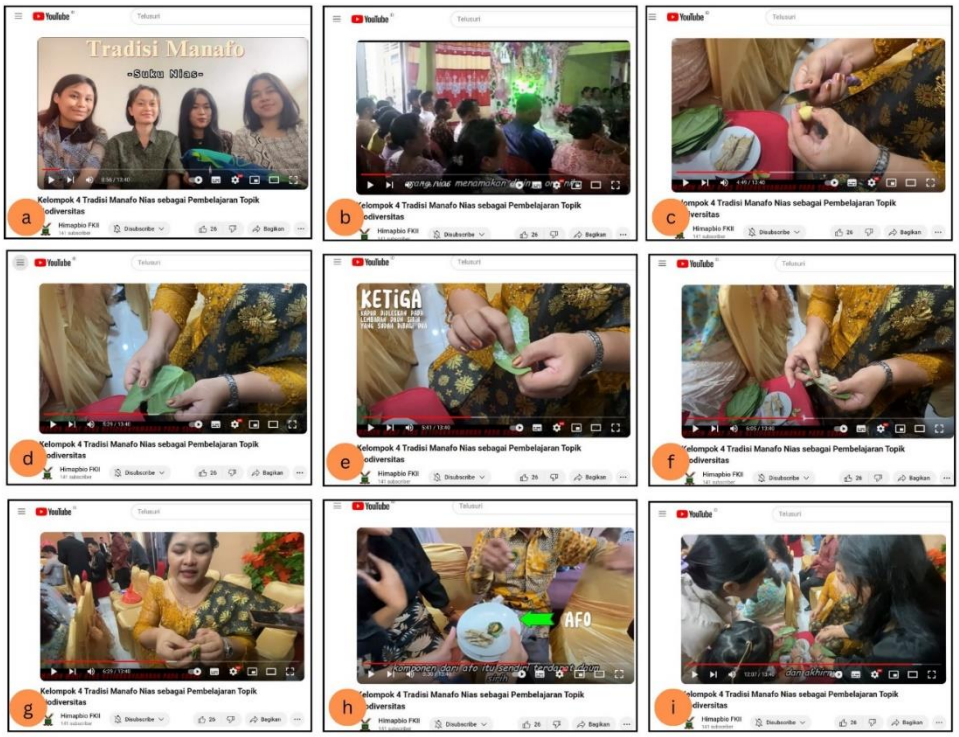

Figure 3. Screenshot of educational video about *Manafo*. (A) Title and purpose of the video; (B) explanation of the Nias tribe; (C) *Sifofona, latihoi guli wino*; (D) *Labagi ma lasika dawuo;* (E) *Famagule betua ba dawuo;* (F) *Bulu gambe la be'e ba mbulu dawuo;* (G) *Dawuo, betua, gambe lafanigaolo bala be'e fino;* (H) *Femanga afo*; and (I) conclusion of the video

The use of educational videos linked to YouTube media can improve vocabulary, including species names. Failure to understand vocabulary can hinder communication and prevent students from retaining information (Dávila et al., 2021). According to Fiorella et al. (2020), students benefit most from viewing images from dynamically generated videos and then verbally explaining what they have learned. Educational videos provide an alternative to on-site learning in situations where this may not be possible (Adinugraha, 2022b). *Manafo*'s educational videos eliminate the need for students to visit the site directly but allow them to observe the process. However, this educational video can be used by students if they want to do *Manafo* to help them remember it better.

Educational videos uploaded on YouTube were rated by respondents. There were 51 respondents who were students (5.88%), bachelor students (54.90%), teachers (13.73%), and others (25.49%). The age range was <=14 years (3.92%), 15 to 17 years (1.96%), 18 to 20 years (19.61%), 21 to 23 years (35.29%), and >=24 years (39.22%). The characteristics of the respondents are presented in **Figure 4.**

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Figure 4. Descriptive statistical data. (A) Age of respondents; (B) Occupation of respondents; (C) Respondents' perception of the video; (D) Respondents' perception of *Manafo* knowledge; (E) Respondents' assessment of each video assessment indicator.

Based on the results of each individual's score, the overall video was rated as excellent, good, satisfactory, and inadequate. A total of 31.37% stated that the video quality was excellent, and 58.82% stated that the video quality was good. A total of 74.51% strongly agreed that the *Manafo* Educational video provided new knowledge to the audience. This means that the *Manafo* educational videos are accepted by the video viewers. The percentage of each respondent's evaluation of the video is shown in **Figure 4.**

The respondents' assessment of the video includes indicators of content and message, relevance, educational value, organization, grammar, delivery and narration, production and editing techniques, audio and sound, visuals and graphics, video quality and camera techniques, and creativity (SMM Conference, 2021). The maximum score is 3. Based on the survey results for each indicator, the respondents' scores range from 2.35 to 2.75. This means that the video is in a good category because it meets the video evaluation indicators with an average score above 2 out of a maximum score of 3. The respondents' evaluation of the video per indicator is shown in **Figure 4.**

The limitation of this study is that the video has not been used for biology

learning but only for the perception of the audience, so its effectiveness in increasing the understanding of biodiversity cannot be known. It is also necessary to study ethnobotany, as there is a lot of knowledge about medicinal plants in Nias based on research of Daeli (2023). In addition, the videos uploaded on YouTube have not been viewed by many people, so it is necessary to disseminate the videos in classroom learning. Therefore, it is necessary to design biology lessons that use indigenous knowledge-based educational videos for learning. Teachers need to use an indigenous knowledge or local wisdom approach to design such learning knowledge and culture (Adinugraha, 2022a; Adinugraha et al., 2021).

Integrating local wisdom or indigenous knowledge with biology subjects through ethnobiological studies such as ethnobotany, ethnozoology, and ethnoecology has the potential to explore local wisdom and cultural approaches (Adinugraha, 2022a). Learning through local wisdom about the importance of species for traditional food production is expected to support students' awareness of the importance of biodiversity values. Making students aware of the importance of biodiversity values is the first step in preventing biodiversity loss.

D. Conclusion

Manafo is made using specific tools and materials. The betel chewing tradition is called *Manafo* because it uses five ingredients: betel leaves (*tawuo*), lime powder (*betua*), gambier (*gambe*), tobacco (*bago*), and areca nut (*fino*). There are four plant species and one lime material used in the manufacture of *Manafo*. Based on the grouping of the clades, it consists of one species of the magnoliids group, two species of the eudicots group, and one species of the monocots group. There are 6 stages in *Manafo*, namely 1) *Sifofona, latihoi guli wino;* 2) *Labagi ma lasika dawuo;* 3) *Famagule betua ba dawuo;* 4) *Bulu gambe la be'e ba mbulu dawuo;* 5) *Dawuo, betua, gambe lafanigaolo bala be'e fino;* and 6) *Femanga afo.* The video was uploaded via YouTube using the link https://youtu.be/jyqUbjH5IZk. The length of the video is 13 minutes, 40 seconds. Based on the survey results for each indicator, the respondents' ratings range from 2.35 to 2.75. This means that the video is in the good category because it meets the video evaluation indicators with an average score above 2 out of a maximum score of 3.31. 37% said that the video quality was excellent, and 58.82% said that the video quality was good. A total of 74.51% strongly agreed that the *Manafo* educational video provided new knowledge to the audience. The *Manafo* educational videos are expected to be an alternative learning medium to better understand the role of species in cultural conservation and human consumption.

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