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Development of Ethno-vlog Media and Virtual Reality (VR) Teh Oyol Ecology and Biodiversity Materials to Equip Students Science Process Skills

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Abstract
Education in Indonesia is currently influenced by the development of science and technology (IPTEK) which is increasingly advanced. Science process skills are one way to teach process skills where students are required to think scientifically, communicate, and think critically and creatively by solving various kinds of problems presented by the teacher in class. This study aims to determine the development, characteristics and validity of ethno-vlog media and virtual reality (VR) oyol tea, determine the effect of ethno-vlog media and virtual reality (VR) oyol tea after learning. This research is a type of R&D research with the 4D development model. The results showed that the characteristics of the oyol tea ethno-vlog include (1) opening activities (2) interviews with sources (3) the manufacturing process, (4) scientific science reconstruction, (5) closing) Characteristics of virtual reality (VR) oyol tea include, (1) virtual world (2) immersion (3) sensory feedback (4) interactivity. he feasibility of ethno-vlog and virtual reality (VR) oyol tea tea consists of media aspects and material aspects obtained very feasible criteria. Ethno-vlog media and virtual reality (VR) oyol tea to equip students' science process skills with a very high category and there are significant differences before and after using ethno-vlog media and virtual reality (VR) oyol tea.
Keywords: Ethno-vlog; Science process skills; Oyol tea; Virtual reality

INTRODUCTION

Education in Indonesia is currently influenced by the development of science and technology (IPTEK) which is increasingly advanced. This technological development is a challenge for teachers to develop students' 21st century skills. Process skills are highly prioritized today, especially in science education. Teachers are competing to continue developing learning methods in deepening science education (Nisrina et al., 2020). 21st century learning is different from the way learning was in the past, learning is often done without looking at certain standards. The current education standards are the foundation needed to achieve learning objectives so that teachers have clear guidelines on what to achieve (Pratiwi et al., 2019). Teachers are required to have many skills to face the challenges of the 21st century and the independent curriculum. One of the demands of the independent curriculum is science process skills.

The results of observations made at SMP Negeri 1 Limbangan show that students' science process skills are still low. Students when doing practicum still have difficulty in applying science process skills properly. Students do not have sufficient understanding of the basic science concepts needed when doing practicum. The results of previous research analysis in reality at school, found that the method of learning science is teacher-centered and does not utilize technology in learning which results in students becoming passive with books and PowerPoint (Lestari & Subekti, 2023). Research that has been conducted shows that science activities and textbooks lack focus on science process skills and some science process skills have not been included (Özalp, 2023 ;Yalcinkaya et al., 2022; Aulia et al., 2023).

The use of innovative media can equip science process skills. In this study, science learning media will be developed in accordance with 21st century learning that can train students' science process skills in the form of ethno-vlog media and Oyol Tea Virtual Reality (VR) on Ecology and Biodiversity material for class VII SMP. Ethno-vlog learning media is media packaged in the form of vlogs that contain local wisdom and scientific concepts (Gumilar & Marwoto, 2023). The results of the analysis of the research that has been done vlog videos can be used as learning media to train science process skills. Students can actively participate and involve themselves in finding information. Students will better understand and apply the knowledge that has been received during the learning process (Rohmatin, 2023). The research has not developed ethnoscience-based vlogs so that researchers want to develop ethno-vlog media to train students' science process skills, Etno-vlog is an ethnoscience-based vlog video. Ethnoscience is knowledge that is owned by certain nations, tribes, or social groups (Sudarmin 2014:46).

This research is related to virtual reality (VR) learning media showing an increase in science process skills. This type of research and development uses the 4D model on virtual reality (VR) in corrosion testing practicum (Nugraha, 2023). Geo-Vulcan Metaverse Virtual Reality shows excellent potential in creating an engaging and innovative virtual classroom experience. Continued adjustments and updates in these areas will help Geo-Vulcan to continue to be a superior solution in virtual learning (Astuti et al., 2025). This research focuses on creating virtual reality through the spatial.io website. Spatial is a Unity game engine-powered platform that allows users to create interactive 3D environments for various platforms, such as WEB, Mobile, and VR headsets. Similar to Frame VR, Spatial has both free and paid versions. The free version of Spatial allows 50 participants per space. This app has advantages and disadvantages. Spatial.io is a strong social space. These tools include chat box, voice chat, screen sharing, gestures, etc. In addition, it has a programming language, extensive documentation to help developers understand the platform features and build more. Sketchfab integration provides users with a large library. Assets can be uploaded to the space without external applications. Although Spatial.io has XR (Extended Reality), VR (Virtual Reality), MR (Mixed Reality), and AR (Augmented Reality). the latest virtual reality applications, Rec Room, FrameVR, and Spatial.io are introduced. The first limitation is that multiple hosts cannot be used in a free network. If more than one host manages a space, a paid subscription is required, leading to devices from Heilig to Apple Vision Pro (Durmaz, 2024).

Science process skills suitable for junior high school / MTs are basic science process skills because it is very important to learn and be mastered by students before learning integration process skills. Science process skills can help Students become more active and think critically (Gasila et al., 2019). Students science process activities can be improved by learning modules that include experimental activities and local wisdom (Susilo et al., 2021). Science process skills are scientific skills that are assimilated from various intellectual skills found in students. These skills can be developed through various exercises to gain knowledge based on experienced phenomena. Assessment of basic science process skills is obtained from indicators, namely (1) Observation, (2) Inference, (3) Measurement, (4) Communicating, (5) Classifying, and (6) Prediction (Ongowo & Indoshi, 2013).

This study aims to determine the development and characteristics of ethno-vlog media and virtual reality (VR) the oyol tea to equip students' science process skills Knowing the feasibility of virtual reality media (VR) the oyol tea to equip students' science process skills. Knowing the effect of ethno-vlog media and virtual reality (VR) the oyol to equip students' science process skills.

METHOD

Research Approach, Type, and Procedure

This research belongs to the type of research and development or R&D. The development model in this study uses the 4D development model developed by Sivasailam Thiagarajan and his team which consists of four development stages, namely Define, Design, Develop, and (Disseminate). The research conducted was only limited to the development stage Develop

Research Subjects

Students were taken from class VIII F as many as 15 students for small-scale trials, as well as all students of class VII F as a class of use or large-scale trials. Students from class VIII F as a small-scale trial subject to find out the response of students in using the product that has been developed.

Data Analysis Techniques

The results of the validation score of each aspect of the feasibility of media products are obtained through a product validation questionnaire filled in by expert validators. The science process skills of students on ecology and biodiversity material are obtained from the analysis of observation scores. Ethno-vlog media and virtual reality oyol tea are said to equip science process skills obtained from the N-gain score. The t-test was used on the initial and final observation results of students' science process skills. The t-test results aim to determine the difference before and after the treatment of using the developed media. If the data is not normal when tested for normality, then use the Mann-Whitney test.

RESULTS AND DISCUSSION

Characteristics and Media Development of Etno-vlog and Virtual Reality of Oyol Tea

Etno-vlog was developed as an innovative learning media that contains science content and concepts as well as local wisdom values that need to be preserved, especially culture related to society, local wisdom or phenomena, and local wisdom of local foods and drinks in Indonesia (Sudarmin *et al*., 2023). Ethno-vlog videos contain several components, including an opening that explains the description of ethnoscience and local wisdom in the region, interviews with resource persons, the process of reconstructing products in the form of food, drinks, and arts and culture, and closing (Sumarni *et al*., 2022). Interviews with resource persons, such as tea farmers and local craftsmen, provide in-depth insights into the traditions and cultural practices behind the production of oyol tea. Students not only get factual information, but also social and cultural contexts that enrich their learning experience through interviews in ethno-vlog media (Awal *et al*., 2023) Utilization of vlogs as a learning resource that offers interactive and fun content that provides an extraordinary learning experience (Sari Ermina, 2023).

Ethno-vlog media development is a systematic and structured process, which aims to create interesting and informative educational content about Limbangan's specialty oyol tea. Students who are taught using ethnoscience learning videos achieve better completeness than those who are not taught using ethnoscience learning videos (Sudarmin *et al*., 2018). The selection of "Teh Oyol Limbangan" as the main topic is a crucial first step. This topic is not only relevant to the local context, but also has high educational value. The content creation process involves several steps, including interview scripting and visual material collection. A well-crafted interview script will ensure that information is obtained from interviewees, such as tea farmers and local businesses, on how to grow tea to pick tea, the tea-making process, and the benefits of tea. Research by Sudarmin *et al*. (2023) that interviews with resource persons regarding the original knowledge of the community related to ethnoscience related to what is tea and ngeteh ethnotechnology regarding how to make tea, and ethnomedicine related to the original knowledge of the community regarding the benefits of tea for health. The script document is used as a reference in the development of learning videos so that each part of the learning video can be organized and arranged correctly (Jundu *et al*., 2020).

Video recordings were conducted at relevant locations, namely the Medini tea garden and the farmer's house in Ngesrepbalong Village. The use of a good quality camera or smartphone, as well as an external microphone, is essential to ensure optimal audio and visual quality. Recording images using a camera to obtain conditions that are contextual to the Students environment (Jundu *et al*., 2020). Video editing using the CapCut application is an important step to process the recorded material. The CapCut application is a very supportive, effective and attractive application that facilitates the work of editors in general and beginners in particular (Adinugroho *et al*., 2024). In this stage, interviews, tea-making footage and scientific reconstructions were systematically organized. The addition of background music typical of the Kendal area and subtitles for the interviews are important elements in enhancing the appeal of ethno-vlogs. Background music can create an

atmosphere that supports the cultural context, while subtitles help Students who may have difficulty in understanding spoken language. The review and refinement stage involved re-watching the video to ensure quality and clarity of information. Getting feedback from expert validators is also an important step to gain an objective perspective on the content (Nahak *et al*., 2024). Finally, the publication of the videos on platforms such as YouTube allows the "Teh Oyol" ethno-vlog to be accessed by a wider audience. This ethno-vlog media can be accessed on the YouTube application on all devices that have a network so that it can be accessed at any time (Fikriyah, 2025). The ethno-vlog of typical Limbangan oyol tea includes opening activities, interviews with sources, the manufacturing process, scientific reconstruction and closing presented in the qr code Figure 1.

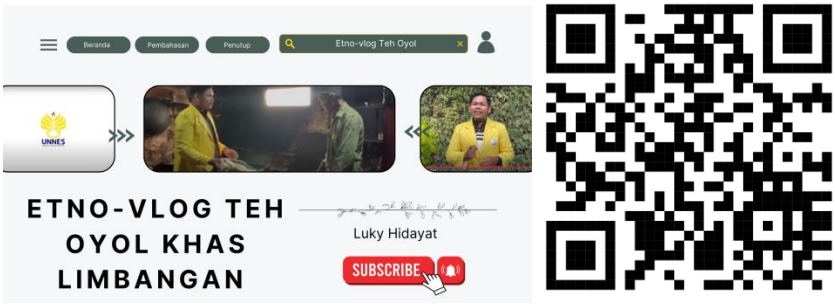


Figure 1. QR Code Etno-vlog Teh Oyol Khas Limbangan

The use of Virtual Reality (VR) technology to develop learning experiences is important to support interactive learning. The VR elements designed can provide a deep understanding of ecology and biodiversity. The VR created falls into the non-immersive simulation type, which is the least immersive VR implementation. Virtual reality is a simulation that generally appears on devices such as computer or smartphone media (Setyawati *et al*., 2023). The term for this type of VR is called desktop VR (Azmi *et al*., 2024). Users enter the virtual world through a portal using a high-resolution monitor. This type of simulation only part of the user's senses are stimulated (Misra *et al*., 2021:158). Virtual world is an environment that is presented in media such as rendering, modeling etc (Saurik & Hadikusuma, 2019). The virtual world was created through the spatial.io platform with a realistic three-dimensional representation of a replica of the mountain and the Ngesrepbalong Village Cafeteria. The rendering technology used allows users to explore this environment in detail by creating an engaging visual experience. Rendering technology in Virtual Reality (VR) refers to the process of generating three-dimensional images or environments that users can interact with in real-time (Topan Bahari *et al*., 2023). The 3D object representation displayed not only enriches the understanding of the physical location but also provides an in-depth visual context regarding the replica of Mount Ungaran. This 3D model creates a three-dimensional object process with the aim of producing a visual representation that includes shape, texture, and size (Winarso, 2022).

Immersion or users experience perception as if physically present in a non-physical world. Virtual reality technology gives users to feel a real environment even though it is fictitious (Misra *et al*., 2021:158). This level of immersion in VR is achieved through visual displays on a desktop computer screen and a keyboard and mouse-based navigation system. Desktop VR systems are still very interesting to develop as they evolve (Pape *et al*., 2019). Low immersion VR virtual environments are accessed through a phone device or computer screen (Kaplan-Rakowski & Gruber, 2021) With this method, users can feel a sense of presence in the virtual environment, as if they were actually inside the gallery.

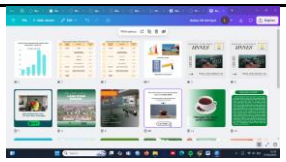
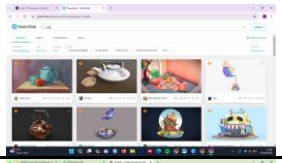
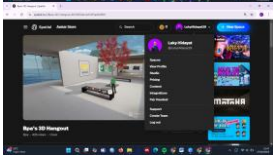
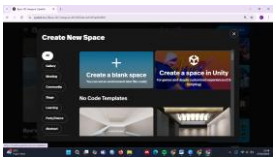
The sensory feedback provided through graphical displays and sound effects strongly supports the immersive experience. Users can talk to other users through virtual avatars. VR provides high interaction capabilities between the user and the virtual world. With controllers, motion sensors, or voice commands, users can manipulate objects, move within the environment, or even talk to virtual avatars (Setiawan *et al*., 2025). Non-immersive virtual reality is less sensorially engaging but suitable for Students provided it has clear visual quality (Liu *et al*., 2023). In addition, the added audio, such as the sound from the video and Kendal Regency's distinctive music, creates a supportive atmosphere and enriches the learning experience. With the audio element, users can

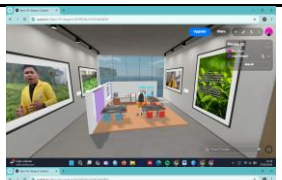
more easily connect with the cultural and social context behind oyol tea, thus increasing their understanding of local values. Interactivity in VR allows Students to respond and interact with the environment in real-time (Utami *et al*., 2021).). Students or users can use navigation tools (controls) using a keyboard or mouse in Non-Immersive VR types (Faiqotuzzulfa & Putra, 2023). Students can perform various actions such as interacting with objects in the virtual environment and moving places in virtual space. In addition, Students can access information from images, videos, and other elements in the interactive gallery. VR is easily applied in various contexts including basic learning and simulation as it does not require sophisticated hardware such as VR headsets or motion sensors (Azmi *et al*., 2024). The virtual reality (VR) recording of oyol tea made on the spatial.io website is presented in qr code Figure 2

Figure 2. QR Recording of Virtual Reality (VR) of Typical Limbangan Oyol Tea

The Oyol Tea virtual reality (VR) development procedure is presented in Table 1.

Table 1. Oyol Tea Virtual Reality (VR) Development Procedure

Preparing content	1. Prepare video images and 3D models that will be inserted into the virtual reality gallery. **2.** The 3D model can be downloaded from Sketchfab or created using Blender/Tinkercad	 
Sign up for an account on Spatial.io	1. Open Spatial.io and register using email 2. Verify account to access VR uploading and editing features.	 
Upload content on Spatial.ai	1. Log in to your Spatial.io account and select "Create a Space". 2. Upload a prepared image, 3D model or video.	 

	3. Make sure each element is arranged according to the Oyol Tea VR concept.	
Custom space creation	Organize VR space layout by placing 3D objects	
VR experience settings	Keyboard and mouse-based navigation for users to explore.	
Trial and adjustment	Testing the finished VR on a PC or on a cellphone Solicit feedback from expert validators	
Publish	Open access on Spatial.io for users to explore VR space.	

Ethno-vlog and Virtual Reality (VR) Feasibility Results of Oyol Tea

Data on the feasibility of Etno-vlog Teh Oyol was obtained from the results of media expert validators and material expert validators consisting of 1 lecturer FMIPA UNNES and 2 science teachers. Validation aims to determine the feasibility of Etno-vlog Teh Oyol before being used in trials. Etno-vlog Teh Oyol is said to be valid if the assessment score ≥ 62.50% is obtained from media experts and material experts. The media aspect of Etno-vlog Teh Oyol consists of aspects of language display and presentation. The results of media expert validation of the Oyol Tea Etno-vlog are presented in Table 2.

Table 2. Media Validation Results by Media Experts

Media Experts	Percentage (%)	Criteria
Learning Media Expert Lecturer	100	Very Feasible
Teacher	100	Very Feasible
Teacher	75	Feasible
Average	91,6	Very Feasible

The results of validation by media experts in Table 2 show that the Oyol Tea Ethno-vlog media obtained an average percentage of 91.6% and was included in the very feasible category. The ethno-vlog media that has been made has received several revisions or improvements. The results of media expert validation of the Oyol Tea Etno-vlog are presented in Table 3.

Table 3. Results of Media Validation by Material Experts

Material Experts	Percentage(%)	Criteria
Science Education Lecturer	100	Very Feasible
Teacher	87,5	Very Feasible
Teacher	87,5	Feasible
Average	91,6	Very Feasible

The results of validation by material experts in Table 3 show that the Oyol Tea Ethno-vlog media obtained an average percentage of 91.6% and was included in the very feasible category. The ethno-vlog media that has been made has received several revisions or improvements.The validation results show that the Oyol Tea Ethno-vlog that has been developed is very feasible to use

for small-scale trials and large-scale trials. The Oyol Tea ethno-vlog that has been revised according to the suggestions and input from media experts and material experts who are already valid is then carried out a small-scale trial. The small-scale trial was conducted in class VIII F SMP Negeri 1 Limbangan with a sample of 15 students. The results of the small-scale trial were used as consideration data before using the large-scale trial presented in Figure 3.

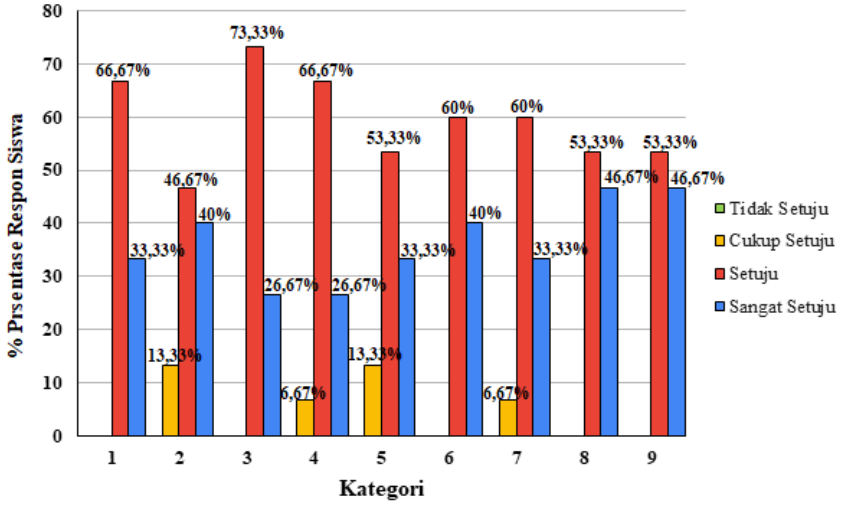


Figure 3. Students Response to Ethno-vlog Media

Description:

(1) The display of oyol tea ethno-vlog media is interesting to use in learning.
(2) Videos and images are clear (not blurry)
(3) The sound quality is clear
(4) The material in the ethno-vlog media is easy to understand
(5) The material in the ethno-vlog media is in accordance with everyday life
(6) The language presented in the video is easy to understand
(7) The oyol tea ethno-vlog media helps me understand the learning material on ecology and biodiversity.
(8) The oyol tea ethno-vlog media helps me to recognize oyol tea in Ngesrepbalong village, Limbangan sub-district.
(9) After seeing the oyol tea ethno-vlog media, I became interested in studying the culture in Limbangan sub-district in particular or in Kendal district in general**.**

Virtual Reality Teh Oyol feasibility data obtained from the results of media expert validators and material expert validators consisting of 1 lecturer FMIPA UNNES and 2 science teachers. Validation aims to determine the feasibility of Virtual Reality Teh Oyol before being used in the trial Virtual Reality Teh Oyol is said to be valid if it gets an assessment score ≥ 62.50% of media experts and material experts. Media aspects of Virtual Reality Teh Oyol consist of aspects of appearance and design. The results of media expert validation of Virtual Reality Teh Oyol are presented in Table 4.

Table 4. Media Validation Results by Media Experts

Ahli Media	Persentase (%)	Kriteria
Learning Media Expert Lecturer	100	Very Feasible
Science Teacher	75	Feasible
Science Teacher	87,5	Very Feasible
Average	87,5	Very Feasible

The results of validation by media experts in Table 4 show that Virtual Reality media get an average percentage of 87.5% and are included in the very feasible category. Aspects of the material validated in this study only from the content of the material in the virtual reality created. Coverage of the material includes the ease of material to be understood and the content of the coverage of ecology and biodiversity material. The results of the material expert assessment are presented in Table 5.

Table 5. Results of Media Validation by Material Experts

Material Experts	Persentase (%)	Kriteria
Science Education Lecturer	87,5	Very Feasible
Science Teacher	100	Very Feasible
Science Teacher	87,5	Very Feasible
Average	91,6	Very Feasible

The results of validation by material experts in Table 5 show that Virtual Reality media obtained an average percentage of 89.6% and included in the category very feasible. Virtual reality media that have been made obtain some revisions or improvements. The validation results show that the Oyol Tea Virtual Reality that has been developed is very like being used for small-scale trials and large-scale trials. Virtual reality that has been revised according to the suggestions and input from media experts and material experts who are already valid then conducted a small-scale trial. Small-scale trials were conducted in class VIII F SMP Negeri 1 Limbangan with a sample of 15 students. The results of small-scale trials are used as consideration data before large-scale trials are used.

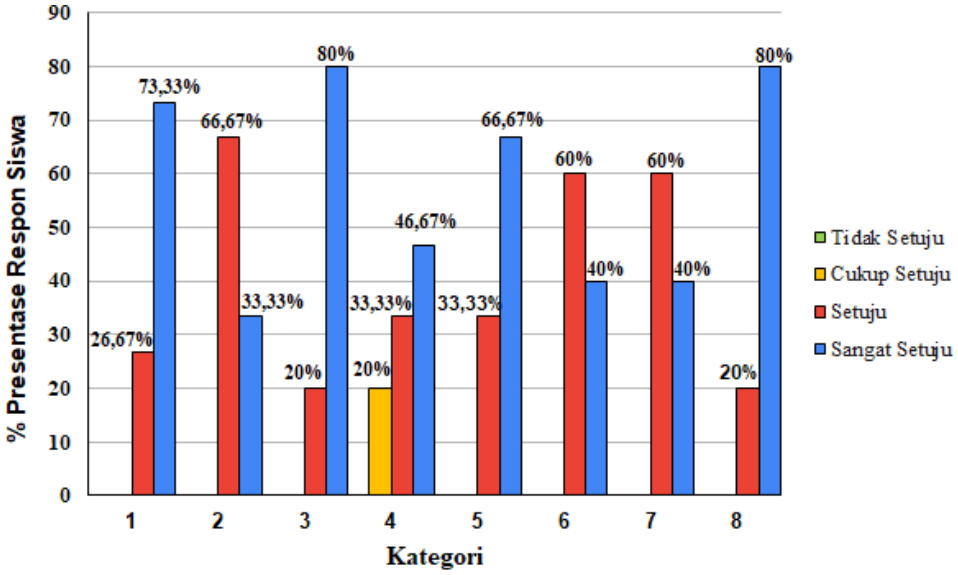


Figure 4. Students Response to VR Media

Description:
(1) The display of virtual reality media is interesting to use in learning.
(2) Easy to operate virtual reality oyol tea
(3) Virtual reality media is practical and can be used repeatedly
(4) The material in the virtual reality media is in accordance with everyday life
(5) The material presented by virtual reality media is easy to understand
(6) The material presented is complete and clear
(7) Oyol tea virtual reality media helps me understand ecology and biodiversity learning materials
(8) Oyol tea virtual reality media helps me to recognize oyol tea typical of Limbangan, Kendal Regency

Results of the Effect of Ethno-vlog Media and Virtual Reality (VR) of Oyol Tea to Equip Science Process Skills

The test of the influence of ethno-vlog and virtual reality (VR) media was carried out after the media made was declared feasible by media and material experts and received good responses from students. Ethno-vlog and virtual reality (VR) media products are implemented in the learning process which is carried out in 4 meetings. The science process skills observation sheet was assessed by the observer during teaching and learning activities by referring to the assessment of the rubric provided by the researcher (Tyas *et al*., 2020). The analysis was carried out through measuring the observation value before and after the treatment using ethno-vlog media and virtual reality (VR)

oyol tea. N-gain test as an indicator to determine the improvement of students' science skills. and students. The N-Gain test measures the relative change between the level of understanding of Students before and after learning (Sukarelawan *et al*., 2024:9). The results of the analysis showed that the average value of learner observations before treatment was 23.18, while after treatment, the average value increased to 48.28. The N-gain calculation obtained is 0.7651, which is included in the very high category. The N-gain value which is greater than 0.3 indicates that the use of ethno-vlog media and virtual reality (VR) oyol tea has succeeded in significantly improving students' science process skills.

T test analysis is used to determine whether there is a difference in the results of students' science process skills before treatment and after treatment. Before further analysis, a normality test was conducted to determine the distribution of observation data. The test results showed that the data before treatment had a significance value of 0.000, and after treatment had a significance value of 0.019. The results of these two significance values are less than 0.05, so it can be concluded that the data is not normally distributed. The data is not normally distributed because the data before and after treatment there is a very extreme difference in numbers. Research by Reasons (2018)) that the cause of abnormal data is due to extreme values in the data, errors in layered processing, the inability of the measurement system to distinguish data, data representing only a small part of the total output produced and values close to zero so that the data distribution will be skewed to one side and the data follows a different distribution. Normal data distribution is the distribution of data that has a balanced pattern (Pratikno *et al*., 2020). In practice, researchers generally expect normally distributed data. However, often the data obtained does not meet these assumptions, so parametric statistical methods cannot be used (Pasaribu *et al*., 2024). These results are important to note, because the distribution of non-normal data requires the use of non-parametric statistical methods for further analysis. T test analysis is included in parametric statistical methods, so the test cannot be done. After knowing that the data was not normally distributed, the Mann-Whitney test was conducted to evaluate whether there was a significant difference between the observed values before and after treatment. The Mann-Whitney test was used to strengthen the results of the study because it did not obtain the prerequisite normality test (Rohmani *et al*., 2025). The results of the Mann-Whitney test showed a sig. (2-tailed) of 0.000, which is also less than 0.05. These results indicate that there is a significant difference in the science process skills of students after the application of ethno-vlog media and VR oyol tea. In other words, the use of both media has an influence on improving students' science process skills. Nugraha's research (2023) that with virtual reality (VR) learning media shows an increase in science process skills. The results of research that has been done, namely the making of vlogs about mosses and ferns, are used as learning resources to teach science process skills based on learning experiences (Rohmatin, 2023). The improvement of students' science process skills was carried out with a combined step of practicum method and ethno-science cultural approach (Fitri & Syukur, 2022).

The results of students' mastery of science process skills obtained through the use of ethno-vlog media and virtual reality “Teh Oyol” showed significant development over four meetings. Measurement is done by analyzing the scores obtained on each indicator of science process skills. The results of mastery of students' science process skills on each indicator from four meetings show significant variations that have increased every meeting. The results of mastery of each indicator are presented in Figure 5

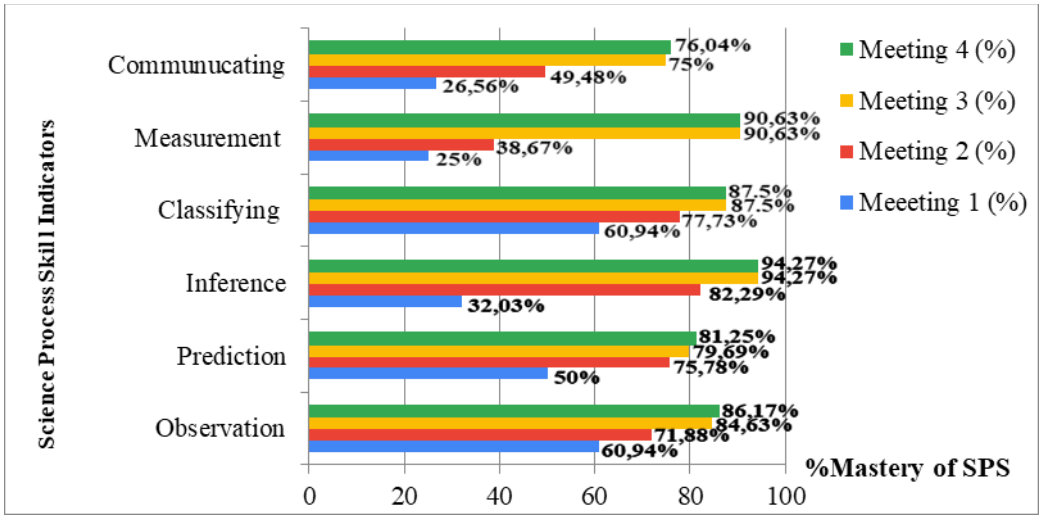


Figure 5. Results of Mastery of Each Indicator of Science Process Skills at Each Meeting

The first indicator of observation, Students use the five senses to obtain certain characteristics (Ongowo & Indoshi, 2013:713-717). Mastery of observation skills increased consistently in each meeting. In the first meeting, only 60.94% of Students were able to make good observations, while in the fourth meeting, the number increased to 86.17%. This shows that Students are getting used to the observation process involving ethno-vlog and VR activities, which allows them to be more detailed in observing objects and phenomena in the ethnovlog and virtual reality (VR) of oyol tea. Observation skills in the teaching and learning process, namely students will be easily active, in this aspect students will use all five senses (Rahayu *et al*., 2021). Students observation skills by viewing vlog and virtual reality shows using the five senses. Observation skills involve Students to utilize their five senses when watching vlog shows, which are then reinforced by answering questions that require direct understanding of the vlog content (Rohmatin, 2023). VR provides an immersive experience that allows Students to feel and observe objects or phenomena in a very realistic environment (Setiawan *et al*., 2025).

The second indicator is predicting, Students can make predictions about future events based on evidence and observations (Ongowo & Indoshi, 2013:713-717). The predicting indicator showed a significant increase from 50% at the first meeting to 81.25% at the fourth meeting. This indicates that Students are starting to be able to make predictions based on the information they observe. When making observations, students will be trained to link their experience or knowledge so that they can predict correctly (Purnamasari, 2020). Students predict existing information or make specific statements that may occur based on evidence through ethno-vlogs and VR oyol tea assisted by liveworksheet Rohmatin's research (2023) that prediction skills involve Students to predict about plant classification based on pictures and analyze the role of moss and ferns. VR provides realistic simulations (Nurannisa *et al*.,2024) allowing Students to experience hypothetical scenarios and predict outcomes based on these immersive experiences. The third indicator of inference, Students are able to explain the results of observations and data (Ongowo & Indoshi, 2013:713-717) The inference indicator shows the most striking results. From 32.03% in the first meeting, mastery of this skill jumped dramatically to 94.27% in the third meeting and remained stable in the fourth meeting. This increase shows that Students are very capable of drawing conclusions and making inferences based on information obtained from ethno-vlog and VR media.

Inference skills make Students learn to interpret data and associate the data found with existing concepts or theories (Asy'ari & Fitriani, 2017). The fourth indicator is classifying, students can classify or categorize based on the same or different subjects (Ongowo & Indoshi, 2013:713-717). Classifying skills also showed a positive increase, from 60.94% in the first meeting to 87.5% in the third and fourth meetings. These results show that Students classify existing criteria or know the similarities and differences between groups classified through ethno-vlogs and VR oyol tea assisted by liveworksheet. In learning, teachers provide based on the ability of Students and classify things based on existing characteristics. The classification process includes various activities, such as

identifying similarities, finding differences, distinguishing characteristics, making comparisons, and determining the basis for grouping (Rosa, 2015).(Rosa, 2015).

Students' grouping skills are high because according to existing theories it is relevant to the learning carried out by students today (Yunita & Nurita, 2021). The fifth indicator of measurement, Students can use nonstandard standards of measurement to describe size (Ongowo & Indoshi, 2013:713-717). The measurement indicator initially showed low results in the first meeting (25%) and increased drastically to 90.63% in the third and fourth meetings. This shows that Students are able to make measurements more accurately after getting hands-on experience through the media used. These results show that Students can know the parameters used to measure abiotic components in the virtual reality of oyol tea. The skills measured are only reading the measurement data. Measurement skills are the ability to use a tool for measuring an object and reading measurement data(Hamadi, 2018).

The sixth indicator of communicating, Students can describe behavior, objects, and events in the form of symbols and words (Ongowo & Indoshi, 2013:713-717). Communicating skills showed a gradual increase, from 26.56% in the first meeting to 76.04% in the fourth meeting. However, despite the increase, mastery of this indicator is still relatively lower than other indicators. This result shows that students still have difficulty in conveying information verbally or in writing, even though they understand the material well. Rohmatin's research (2023) communication skills require students to express ideas in writing by describing the results of observations on the worksheet provided. Communication is not only done orally, but can also be conveyed in writing (Yusefni & Sriyati, 2016). Communicating skills can still be practiced during the learning that has been done, where students with the guidance of the teacher conduct discussions together (Diton Hermana *et al*., 2022).

Figure 3. Small Scale Trial of Etnovlog Media and Virtual Reality (VR) of Oyol Tea

Figure 4. Large Scale Trial of Etnovlog Media and Virtual Reality (VR) of Oyol Tea

CONCLUSION

The characteristics of the ethno-vlog of oyol tea include, (1) opening (2) interviews with sources and the process of making oyol tea (3) scientific science reconstruction (4) closing (quizzes or tasks made for students). The characteristics of virtual reality (VR) for oyol tea include (1) virtual world (2) immersion (3) sensory feedback (4) interactivity. The feasibility of ethno-vlog and virtual reality (VR) oyol tea tea consists of media aspects and material aspects obtained very feasible criteria. Ethno-vlog media and virtual reality (VR) oyol tea to equip students' science process skills with an average score of very high N-gain and there are significant differences before and after using ethno-vlog media and virtual reality (VR) oyol tea.

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