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The Jamasan Keris Tradition: An Ethnopedagogical Approach to Chemistry Learning

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Abstract

The experiment discussed adopts a qualitative approach, focusing on descriptive research to understand phenomena without manipulation. Analysis of documents and literature on Jamasan Keris traditions provides insight into cultural values. Chemical analysis of materials used in Keris and its related rituals enhances scientific understanding. Qualitative research on chemistry learning in the context of Jamasan Keris aims to improve learning methods. Research data sources include literary studies, documents, archives, and historical artifacts.

Ethnopedagogy is applied to traditional ceremonies like Jamasan Keris, integrating cultural heritage and scientific principles into education. Various research studies contribute to understanding Jamasan Keris, local cultures, and their relevance to learning.

The chemistry learning outcomes are focused on elements and prioritize students' comprehension and proficiency in process skills. The chemical reactions responsible for Keris maintenance, including cleaning and corrosion prevention, are identified. The text discusses the many chemicals used for shell cleaning and their reactions, emphasizing the need of choosing the right ones and following suitable methods.

In conclusion, the incorporation of Jamasan Keris customs into education using an ethnopedagogical approach enhances learning experiences and supports the preservation of cultural heritage. Gaining a comprehensive knowledge of chemical concepts involved in shell repair improves conservation efforts, guaranteeing the genuineness and excellence of historic weaponry.

Keywords: Chemistry Learning, Ethnopedagogy, Jamasan Keris Tradition.

Introduction

Keris has the cultural and spiritual importance of Indonesian heritage. The shell is not just a weapon but a symbol of prestige, power, and protection, representing a sophisticated craft that reflects the skill and skill of its makers. Historically, Keris has been associated with stories of heroism and mysticism, serving as a symbol of succession and sacred relationship with ancestors. The shape and design is filled with

symbolism, representing balance, harmony, and social values. In addition, Keris plays a role in ceremonial rituals, such as the "Pusaka" tradition of Java, where he is observed and believed to have mystical powers. Studies have demonstrated the holistic significance of traditional artifacts such as Keris in preserving cultural identity and promoting a sense of belonging in communities, emphasizing their sustained relevance in contemporary Indonesian society.

The Jamasan Keris tradition, or procession of ritual cleansing of heritage grit, has significant cultural and spiritual importance in Indonesian society. The research is aimed at exploring such traditions from the perspective of straw making, and chemistry. By studying tradition comprehensively, we intend to reveal its significance, potential benefits in the learning of natural sciences.

According to (Mamluaturrahmatika, 2022) the importance of meaningful and contextual learning models, such as Problem Based Learning integrated with ethnosciences, can have a significant impact on educational outcomes. It resonates with a thorough process of cleansing the shell, where each step symbolizes spiritual purification and historical honor. In addition, (Avivah, 2022) investigates the symbolic meaning in traditional Java wedding rituals, highlighting the complex layer of traditions and cultural symbolism embedded in the ceremony. Attractive parallels between the ritual of cleansing the shell and the rich symbolic message in the traditional Java practice emphasize the importance of preserving cultural heritage through rituals and sacred ceremonies, transcending generations and painting a living picture of Indonesian cultural tapestry.

A key aspect of the Indonesian tradition of peeling is the process of carefully cleaning these weapons. The origins of Jamasan Keris (washing of Keris) can be traced back to ancient beliefs and practices that emphasize the spiritual relationship between the shrew and its owner. The act of cleansing the shell is not just a routine of physical maintenance but a sacred ritual that symbolizes cleansings and respect for the spiritual power of the weapon. Historically, the cleaning of shells was done by skilled craftsmen known as empu, who were not only skilled in wrapping and hardening shells, but also experienced in spiritual rituals associated with these objects. Over time, the tradition of cleansing shells has been preserved and passed on through generations, with each family or community developing unique methods and ceremonies to maintain the integrity and holiness of these weapons. Similarly, historical studies related to ancient metallurgy of shale making are important to understand, not only related to shale manufacturing, but also to human evolution and civilization (Ghazali et al., 2015).

Cultural influence plays an important role in shaping the Tradition of Washing Keris, a significant ritual practice in Indonesian heritage. The intersection of language policy and planning, as discussed in (Kurniawan, 2017), provides an understanding of the important cultural nuances associated with this traditional ceremony. Language, as an important aspect of cultural identity, is very complexly embedded in a network of national unity and pride. In addition, the study underlined in (Rahmaniah, 2014) emphasizes the impact of historical education on promoting interethnic relations and national solidarity, highlighting the importance of cultural awareness and historical narrative in shaping social cohesion. By incorporating elements of new historical approaches and local narratives in the teaching and learning process, the perception of identity and ownership among young generations, including the practice of the Jamasan (washing) of Keris, can be enriched, promoting a greater sense of cultural appreciation and unity. The findings underline the important role of cultural influence in preserving and reviving traditional practices such as the washing of cakes to strengthen the Indonesian cultural heritage.

In the field of traditional Java culture, the process of thorough cleansing the shell has a significant symbolic representation, emphasizing the profound respect and spiritual connection associated with this sacred

weapon. The ritual cleansing of the straw is not just a physical act, but a symbolic movement of cleansings, renewing its spiritual essence and respecting the heritage of its ancestors. According to (Eliasmith, 2013), structured representations in neurons play an important role in understanding the cognitive processes involved in complex traditions such as heritage cleansing.

Conventional learning lacks relevance, and factors that influence the learning process. Teachers are generally more focused on learning outcomes rather than on the process of achieving learning goals and often ignore the selection and use of media in the learning process, while media is one of the sources of information that contributes to the achievement of learning goals. To these goals, strategies, approaches, methods, techniques and media are needed in proper learning.

AECT (Association of Education Communication Technology) in (Seels & Richey, 1994) classifies the six components of the learning system as:

1. Message, which is information/teaching conveyed by other components in the form of ideas, facts, meanings, and data. Included in the message component are all fields of study/courses or learning materials taught to students.
2. People, referring to humans who act as receivers, processors, and presenters of messages.
3. Material, which is software containing messages to be presented with tools or hardware devices or by itself.
4. Device, something (hardware) used to deliver messages stored in material.
5. Technique, procedures or references prepared for the use of material, equipment, people, environment to deliver messages.
6. Setting, the situation or atmosphere surrounding where the message is delivered, both physical and non-physical environments.

Research on the microstructure and mechanical properties of traditional Keris is very rare, highlighting gaps that need to be overcome. The lack of comprehensive studies, as demonstrated by (Musa, 2017), emphasizes the need for in-depth analysis through non-destructive tests and hardness to understand the complex details of this ancient sharp weapon. On the contrary, Sumenep's caterpillar from Madura Indonesia, as noted in (Rakhmawati et al., 2022), has a unique philosophy and artistic style that can enhance the tourism potential in the region. The research into the potential of the sumenep citerpillar not only reflects Madura's cultural heritage but also suggests a strategic approach to integrating it into the broader framework of tourism development. Therefore, understanding the microstructural and artistic values of the traditional shrubs of different regions is essential to preserve their cultural significance and exploit their tourism potential effectively.

The annual washing ceremony, known as the washing tradition, has great significance in Indonesian culture. These ceremonies or festivals, embedded in tradition and history, symbolize the cleansing and rejuvenation of Keris, have spiritual significance. Ceremonies usually involve complex rituals performed by skilled people or "Empu" or carpenters and members of the community, emphasizing the respect and respect given to these cultural artifacts. The public usually comes and gathers to witness the procession of the ceremony, which involves prayer, and cleansing with careful techniques passed down from generation to generation. The festival serves as a reminder of the cultural heritage and crafts associated with Keris, a symbol of power and prestige in Indonesian society. By preserving this tradition and honoring the Keris through the annual cleansing festival, this community maintains a connection with the past and reinforces values of respect and conservation. Based on this, keris is a great acculturation that occurs between religion and culture that is able to merge with a high aesthetic and symbolic value. (Sudrajat, 2011).

Relationships with practices that have been carried out by ancestors in the context of the transmission of traditional knowledge have significant relevance in contemporary societies, in the field of ecological and cultural conservation. The tradition of cloth washing is a relatively niche cultural practice or a specific market segment, the tradition of washing cloth has gained international recognition in recent years. This can be attributed to the growing global interest in traditional crafts and the preservation of cultural heritage. The thorough process of washing (Jamasan) Keris, with its profound spiritual and symbolic meaning, has attracted the interest of scholars and collectors all over the world. International exhibitions and conferences have helped to exhibit the beauty and complexity of this ancient ritual, further strengthening its status as a unique cultural tradition. In addition, the inclusion of Jamasan Keris on the list of UNESCO Intangible Cultural Heritage has raised its profile on the global stage, emphasizing its importance in protecting intangible cultural practices.

In the history of the spread of Islam from the Arab jazirah which then interacted and fought with the new socio-cultural environment, two models of cult were known; compromise and non-compromising. A non-compromising model is an invitation to Islam in a way that brings together or blends Islam with teachings or traditions of different cultures or even appears contrary to the content of the sharia. While a non-compromised model is a call that emphasizes and preserves the integrity and purity of the Sharia, so that he in its application has a rather rigid view in the face of the social environment, the culture of the local art (Kholil, 2007).

Research Methods

(Deming, 2018) states that research planning includes: determining research topics; conducting literary studies to find research gaps, formulating hypotheses or problem formulations as well as planning methodologies, i.e., research design, sample selection, research instruments, and so on.

This experiment uses a qualitative approach, and a kind of descriptive research, aimed at describing phenomena or events or things and collecting facts and data and informing them as they are not intended to manipulate or control(Creswell John and Creswell David, 2023).

In this study, by conducting an analysis of documents and literature about the traditions of Jamasan Keris can provide in-depth insight into cultural values, and the related social context. Researchers can gather information from various sources such as books, articles, historical documents, and cultural records to enrich their understanding of this tradition. The researchers can also illustrate the physical principles involved in the manufacture and use of shells, as well as conduct chemical analysis and chemical processes of the materials used in shells. It can help research participants to better understand scientific concepts in a more concrete way.

A descriptive qualitative study of Jamasan Keris chemistry learning in Indonesia, how learning chemistries in the context of Jamassan Keris can enhance the understanding of concepts effectively. The results of this research are expected to make a valuable contribution to the development of innovative learning methods in physics and chemistry. Therefore, descriptive qualitative research on learning chemistry is essential to be applied to provide a clear and detailed picture of existing learning practices(Santrock, 2016).

Source of research data: 1) Conducting a literary study of *Jamasan Keris*, Java culture, as well as the physical and chemical concepts associated with the manufacture and use of shrews can provide a strong theoretical foundation for research. The information from these sources can be used to deepen the understanding of the historical, cultural, and scientific context of the tradition of Jamasan Keris. 2) Documents and archives that are video-related to the tradition, thus can provide in-depth insight into the

meaning, process, and cultural values associated with this tradition as well as to understand in more detail the measures taken and the influence of local culture in its implementation. 3) Historical documents and artifacts, such as ancient texts, pictures, can provide concrete evidence of the practice of the past. It can help researchers to track developments and changes in these traditions over time.

Table 1. Historical, socio-cultural, religious, manufacturing/metallurgical, and chemical aspects of the Keris:

Aspect	Description
Historical Aspect	- The Keris has been an important weapon and cultural artifact in Southeast Asia, particularly in Indonesia, Malaysia, and the Philippines, for centuries. - It is traditionally seen as a symbol of power, bravery, and spiritual protection. - Historical records and artifacts date the Keris back to at least the 9th century. - Keris are often linked to significant historical events and figures, serving as heirlooms passed down through generations.
Socio-Cultural Aspect	- The Keris plays a vital role in Javanese and other Southeast Asian cultures, often featured in ceremonies, traditional dances, and rituals. - It is regarded as a status symbol and a mark of identity, reflecting the owner's social status and craftsmanship skills. - Keris are often intricately decorated with cultural motifs and symbols, reflecting the region's artistic heritage. - The process of giving and receiving a Keris is steeped in tradition, symbolizing respect, trust, and social bonds.
Religious Aspect	- The Keris is considered sacred and is often associated with spiritual beliefs and practices. - Many believe that a Keris possesses spiritual energy or mystical powers, offering protection and guidance to its owner. - Rituals such as the Jamasan Keris (cleansing of the Keris) are performed to maintain the spiritual and physical integrity of the weapon. - Keris are often used in religious ceremonies and as part of offerings in temples and sacred sites.
Manufacturing/Metallurgical Aspect	- The crafting of a Keris involves highly specialized metallurgical techniques, combining layers of different metals to create the distinctive blade patterns. - The process requires significant skill and knowledge in forging, tempering, and shaping the blade. - Traditional methods often include folding and welding different metals, such as iron, nickel, and steel, to enhance the blade's strength and aesthetic quality. - The handle and sheath are also crafted with detailed artistry, often made from precious materials like wood, ivory, or gold, and adorned with carvings and inlays.

Aspect	Description
Chemical Aspect	- The chemical composition of the metals used in Keris forging is crucial for its durability and appearance. - Maintenance of the Keris involves understanding chemical reactions, such as using citric acid to remove rust (iron oxide) without damaging the blade. - Chemical treatments, including the application of protective coatings and oils, are essential to prevent corrosion and preserve the blade. - Understanding oxidation-reduction reactions, acid-base interactions, and other chemical processes is key to the proper care and conservation of Keris.

This table encapsulates the multifaceted significance of the Keris, emphasizing its role not only as a weapon but also as a cultural and spiritual icon, an example of metallurgical craftsmanship, and a subject of scientific interest in terms of its maintenance and preservation.

The adaptation of modern technology in various fields, from agriculture to software systems, poses challenges and opportunities for emerging societies. The scientific work (Al-refai, 2016) emphasizes the importance of validating on models before implementation. This approach utilizes model execution to ensure the reliability and accuracy of the adaptation process. By exploring and integrating adaptive strategies in various fields, researchers and practitioners can better address the challenges and leverage the potential benefits of adaptation to modern technology.

Relevant research results:

1 Introduction to Kris, a traditional weapon of Indonesia: Preserved-lingering issues of facts Researcher: Sugeng Purwanto, Idha Nurhamidah.

Publisher: EduLite Journal of English Education, Literature, and Culture, Vol. 6, No. 2, August 2021, pp. 397-41.

Research methods: The study gathered comprehensive information about the Kris through various resources, including interviews with key figures and other documents related to the Kris. Each interview lasted about 45 minutes per question, covering six questions aligned with the research objectives. Respondents had the freedom to choose any of the six questions they felt they could describe in detail.

Conclusions and findings: The Kris is regarded as Indonesia's oral and intangible legacy, serving as a representation of the national identity of Nusantara (Indonesia) and mirroring the intellectual and civilizational progress of its people..

The Kris is appreciated both for its aesthetic qualities and its magical attributes. (Wilah). Additionally, the Kris can reflect the owner's way of life.

2 Design build visualization learning Java Layer Identification Multimedia-based.

Researchers: Sugeng Winardi. Publisher: Vol. XI No. 31 March 2016 - Journal of Information Technology

Research Methods: The results of this research are an easy-to-operate learning visualization based on multimedia so that all communities are easy to recognising one of the cultural heritage of the shell.

Conclusions and findings: At the application testing stage, all application results can be tested. Testing is done by testing on each module of the program alone so it cannot be done in its entirety.

This functionality test includes descriptions as well as appearance and process compatibility. From the functionality test results, the entire application can run seamlessly or reliably.

From the results of the questionnaire distributed to 20 users, it was concluded that the application program is easily accepted and can meet needs and can provide clear information and add knowledge.

3 Tradition of Jamasan Pusaka in the village of Baosan Kidul district of Ponorogo (Study of Cultural Values and Historical Learning Resources.

Researchers: Kabul Priambadi and Abraham Nurcahyo. Publisher: Journal AGASTYA Vol 8 No 2 July 2018 Research Methods: Qualitative Descriptive Research. For data collection in this study is done with a lift and documentation.

Conclusions and findings: Heritage jewelry is one way of treating heritage things that are thought to be good. In the traditions of the Java community, inheritance is a spiritual activity. which is sacred and performed at a certain time on the Suro Moon as in the Southern Baosan Village of Ponorogo. The bathing wrapping of the legacy or shell uses fine orange water observation and is usually done in each home on the month of Suro.

4Analysis of Local Cultural Relevance with High School Chemistry Materials to Develop Cultural Based Inquiries Guided Learning Devices.

Researchers: I Nyoman Suardana Publisher: Journal of Education Indonesia Vol. 3, No. 1, April 2014 Research Methods: Descriptive Research. Subjects or sources of data in the form of documents (research reports and books) as well as informants from the community, i.e. salt farmers, winemakers, silver and gold craftsmen, farmers and household mothers. The research objects are local cultures that are relevant to high school chemistry to be integrated into culture-based inquiry learning.

Conclusion and results of his research: Based on the results of the above research and discussion, it can be concluded that the local culture of Bali that is relevant to high school chemistry can be grouped into five areas, namely:

1. Religion, including: ritual of stitching of threads and scratches in the ceremonies of pewiwahan, abhiseka, melasti, ngaben, mecaru, panca mahabhuta, and pancadatu;
2. food, which includes: making kitchen salt, alcohol, stake, vinegar, red sugar, daluman and santan, meat use, as well as scratching of bananas;
3. traditional crafts, which include: treating legacy shells, filling gold, and making bushes and drawers;
4. health, which covers: cherries, candy pills, bee pesticides, snake bite medicine, and ginger; and agriculture, which is a natural pest.

To obtain the side of ethnopedagogy, in the traditional ceremony of the Jamasan Keris as a tool to teach physics and chemistry and also to promote a deeper understanding of cultural heritage and scientific principles. By incorporating these ancient rituals into the educational curriculum, students can develop a comprehensive appreciation for the historical significance of Keris, as well as the scientific processes involved in its conservation.

Research on the traditions of Jamasan Keris in the perspective of ethnopedagogy for the study of physics and chemistry offers a number of interesting innovations, among others:

1. Multidisciplinary integration: This approach combines aspects of physical and chemical in studying the tradition of shredding, enabling students to see the relationship between traditional culture and modern science.
2. Understanding Local Culture: Students learn about local cultural values in the traditions of Jamasan Keris , understand the importance of cultural heritage in the formation of local identity and wisdom.
3. Application of Physics Concepts: This research reveals the principles of physics in the manufacture and use of shells, such as the properties of materials, strength, and energy involved in the selection of

4. materials and shells formation.
5. Material Chemistry Analysis: From a chemical perspective, this research involves the analysis of the composition of materials used in shells making, providing an understanding of traditional manufacturing processes and chemical applications in a cultural context.
6. Developing a Contextual Learning Approach: Using the tradition of Jamasan Keris as a learning context enables teachers to develop a more contextual and relevant approach, enhancing students' interest and involvement in physics and chemistry learning.
7. Understanding Ethnopedagogy: This research helps to understand how ethnopedagogic approaches can be applied in formal education, opening opportunities for further research on the integration of local cultures and traditions into school curricula.

With the combination of these elements as well as the Chemical Learning Access Guide (Kementerian Pendidikan Kebudayaan Riset dan Teknologi, 2022), the research of the traditions of the crust in an ethno-pedagogical perspective has the potential to make valuable contributions to students' understanding of the relationship between culture, science, and learning.

Table 2: Chemistry Learning Outcomes Based on Elements

No.	Element	Phase F (Grades XI and XII)
1.	Chemistry Understanding	Students are able to observe, investigate, and explain everyday phenomena according to scientific principles to explain everyday chemistry concepts; apply mathematical operations in chemical calculations; study the properties, structures, and interactions of particles in forming various compounds, including their processing and applications in daily life; understand and explain the aspects of energy, rate, and equilibrium of chemical reactions; use acid-base concepts in daily life; use chemical energy transformations in daily life, including thermochemistry and electrochemistry; understand organic chemistry including its applications in daily life.
2,	Process Skills	1. Observing: Able to select the appropriate tools for measurement and observation. Pay attention to relevant details of the observed object. 2. Questioning and Predicting: Formulate scientific questions and hypotheses that can be scientifically investigated. 3. Planning: Plan and select appropriate methods based on references to collect reliable data, considering risks and ethical issues in using these methods. Select and use tools and materials, including appropriate digital technology, to systematically and accurately collect and record data. 4. Processing and Analyzing Data and Information: Interpret obtained information honestly and responsibly. Use various methods to analyze patterns and trends in data. Describe the relationships between variables and identify inconsistencies. Use scientific knowledge to draw conclusions consistent with the investigation results. 5. Evaluating and Reflecting: Evaluate conclusions by comparing them with existing theory. Identify strengths and weaknesses of the investigation process

No.	Element	Phase F (Grades XI and XII)
		and its effects on data. Identify problems in methodology and propose suggestions for improvement for future investigations. 6. Communicating Results: Communicate investigation results comprehensively, including safety, environmental, and ethical considerations, supported by arguments, language, and scientific conventions appropriate to the investigation context. Demonstrate systematic thinking patterns according to the specified format.

Research Results and Discussion

Research results the "mewarangi" process in a shell is performed after the shell undergoes a finishing type of thought/reduction. The long, difficult and complicated series of processes that the empu's mastered have indeed covered too low forging processes and less large hammer beating styles. The process of showing patterns involves a chemical process, i.e. the reaction of different metal layers with chemical substances, among other things, the pattern. The process of "worshipping" is done after the shell undergoes a finishing of thought or grinding. The long, difficult and complicated series of processes that they mastered have indeed covered planning, design, manufacturing, process control, and quality control, even though all of them are not in the writing and design pictures(Wijayatno, 2011)..

In this context, an in-depth understanding of the chemical properties of the materials used in shell treatment becomes crucial. For example, the use of citric acid to cleanse the rust on the shell bars showed that the interaction between the citrate acid and the iron oxide compounds in the rust has a significant effect in cleaning the rust without damaging the material.

The care of the coat is essential to preserving the authenticity and quality of this traditional Indonesian weapon. An important part of skin care is to clean and treat it regularly. The process of cleaning and caring for the shell can prevent damage to the beam and the scissors which are an important part of the shelter itself. Periodic cleaning of the shells can also remove dirt and dust that can damage the shell material. The utilization of specific chemicals during the cleaning procedure is crucial for enhancing the cleanliness and luster of the shell. Nevertheless, it is crucial to use caution while choosing chemicals due to the shell's status as an heirloom with significant historical worth. Hence, it is crucial to meticulously attend to the cleaning and maintenance of the shell to ensure the preservation of its genuineness and aesthetic appeal.

Chemical reactions involved in cleaning the shell This study also identified chemical reaction involved in the cleaning of shell. The shell cleaning process involves a series of steps that use specific ingredients to remove rust and dirt from the shells. In this chemical response, citric acid and saline solution can be used to scrape the rotting layer that sticks to the metal surface of the shelter(Mawati, 2014). In addition, the use of coconut oil has also been found to be effective in preventing corrosion on the shell beams.

An oxidation-reduction-oxidation reaction is a chemical reaction that occurs when an element or compound loses or gains electrons in a certain chemical environment(Lew, 2008). In the context of shell treatment, the oxidation-reduction reaction plays an important role in cleaning the rust that sticks to the shell. This process involves the transfer of electrons between the chemicals involved, which will eventually change the chemical properties of the rust. In addition, the oxidation-reduction reaction can also help in removing stains or other dirt that stick to the shaft. However, it should be noted that the use of chemicals for these reactions should be done with care and care to avoid damage to the precious and

historical shell surfaces.

The acid-base reaction plays an important role in shell care, especially in the process of cleaning the rust that adheres to the bars. When a soft acid, such as vinegar or orange juice, is used to absorb and dissolve rust, a chemical reaction occurs that changes the properties of the oxidized iron. During this reaction, the H+ ions of the acid interact with the Fe3+ ion in the rust and form a more soluble compound like Fe2O3 (Lew, 2008). In contrast, in the process of cleaning the shell with a base, such as baking soda or ammonia, the OH- ions from the base react with a Fe3 + ion within the rust to form more soluble compounds such as Fe (OH)3. With a deep understanding of these acid-base reactions, an effective and safe cleaning method can be found to extend the lifespan and maintain the authenticity of the shells.

The type of cleaning agent used for shells This research identifies several types of cleansing agents used to clean shells. One type of commonly used cleanser is an oxalate acid solution. Oxalate acids work by binding the metal ions present on the shells and forming complex compounds that are water-soluble. In addition, cleaning agents such as citric acid (present in thin oranges) are also often used because of their properties that can dissolve the crust and dirt without damaging the metal surface of the shell.(Taslimi, 1954).

Alkaline Solution For cleaning and treating scales, alkaline solutions such as ammonium hydroxide solution or baking soda solution are often used. These solutions can help dissolve the dirt that sticks to the metal and facilitate the cleaning process(Sofyan, 2021).

The results of the research show that chemical reactions have a significant impact on the resistance of the shell. The various kinds of chemicals used in the cleaning and maintenance process can affect the authenticity of the material made by the shell, such as iron or brass. Chemical changes that occur as a result of the use of certain chemical substances can damage the unique molecular structure of the shelter, causing color changes, corrosion, or even cracks on the shaft. Therefore, it is important to pay attention to the type of chemical used and the proper procedures in cleansing and treating the shells.

Corrosion Prevention In addition to regularly cleaning the shells, another important step in treating these traditional weapons is to prevent corrosion. Corrosion often occurs as a result of chemical reactions between the metal and its surroundings, especially high humidity(Shreir, 1976). To prevent corrosion, a number of preventive measures need to be taken, including the use of anti-corrosion coating on the bar and storage of the bar in a dry and protected place from moisture. Besides, owners are also advised to use special lubricant oils to keep the moisture of the bars in optimal condition. By keeping the shell from corrosion, it can extend its life and preserve the authenticity of traditional weapons of high historical and cultural value.

Surface protection The discussion of surface protection' in shell care is an important thing that needs to be considered in depth. The shell surface protection is intended to protect the shell from shell corrosion and physical damage due to environmental factors. One of the most commonly used methods is to apply a protective layer such as oil or special candles that can form a barrier against moisture and oxidation. Success in the application of the surface protection of the shell depends heavily on the selection of protective material that corresponds to the characteristics of the metal shell itself. In addition, the application technique also plays an important role in ensuring that the protective layer can stick properly and evenly across the surface of the shell. Further studies of this surface protection will make a significant contribution to improving understanding of the conservation efforts of Jamasan Keris as a valuable cultural heritage for Indonesia.

In the Indonesian context, ethnopedagogy refers to the application of an approach that takes into account culture, traditions, and local values in the educational process. It's important because every society has different cultural peculiarities and life views. By understanding ethnopedagogy, educators can design more relevant and effective learning strategies in accordance with the local cultural context. Besides, Ethnopedagogy can also enrich students' learning experiences by introducing them to a rich cultural heritage.

The integration of the values of local wisdom and Pancasila in learning practice is also a key element.

By incorporating these values into learning, students not only learn academic concepts, but also internalize the noble values that are cherished in society. The implementation of a new curriculum that emphasizes the character of Pancasila as an integral part of learning is a positive step in applying the concept of Ethnopedagogy. The curricula that integrate values, extracurricular activities, and teachers' training support aims to improve the quality of learning, develop global citizens, and promote problem-solving skills in line with the principles of pancasila. It shows the continuity between ethnopedagogy as a conceptual foundation and the implementation of actual educational policies. (Suwarsih Madya, Fuad Abdul Hamied, Willy A. Renandya, Christine A. Coombe, 2020).

In the coating process, the materials used have a chemical content that helps students understand the concept of chemicals and acid-base reactions, and oxidation-reduction reactions as well as the related concept of corrosion prevention on metals.

Table 3: Chemical Substances for Cleaning Layers and Chemical Reactions

Chemical Substance	Chemical Formula	Chemical Reactions
Coconut Water	Contains K element (potassium)	No specific chemical reaction, used as a natural ingredient to clean and provide a natural protective layer to the layer bars.
Citrus Aurantiifolia	$C_6H_8O_7$	Citric Acid ($C_6H_8O_7$) + Rust (Fe_2O_3): 2 C_6 H_8 O_7 + Fe_2O_3 → 2 $Fe(C_6H_6O_7)$ + 3 H_2O
Substances (Arsenic Trioxide)	As2O3	As_2O_3 + Fe: 2 As_2 O_3 + 6 Fe → 2 As + 3 Fe_2O_3
Acid Water	Contains the elements Manganese (Mn), Phosphorus (P), Iron (Fe)	Contains amylum $(C_6H_{10}O_5)n$, no specific chemical reactions, is used to clean and provide a protective layer.
Ca (OH)2	Calcium Hydroxide	Ca $(OH)_2$ + CO_2: Ca $(OH)_2$+CO_2 → $CaCO_3$ + H_2O
Coconut Oil	Contains Palmitic Acid: (CH3(CH2)14COOH)	Contains triglycerides, used to protect shell bars from corrosion without specific chemical reactions to metals.
Sulphur	S	S + Fe: Fe + S → FeS (used in limited amounts)

Conclusions And Implications

The Jamasan Keris Tradition, through an ethnopedagogy approach, can be used to teach physics and chemistry, providing a deep understanding of cultural heritage and scientific principles. This

multidisciplinary integration helps students see the linkages between traditional culture and modern science, enriching local cultural understanding and contextual learning methods.

The study identified chemical reactions involved in shell maintenance, such as the use of citric acid to cleanse rust, which interacts with iron oxide compounds effectively without damaging the material. Various chemicals used in cleaning, like citrate acid and alkaline solutions, indicate the importance of proper selection to maintain shell integrity.

Corrosion prevention measures include the use of protective coatings and storage of shells in dry environments to preserve their historical and cultural values.

Understanding and applying the principles of ethnopedagogy in education can enrich the learning experience, by incorporating local cultures and values. Integrating these elements into the curriculum promotes comprehensive learning that respects cultural heritage and scientific research.

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