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Integration of Palembang Cultural Products in the Learning of Electrolyte and Nonelectrolyte Solutions: An Ethnopedagogical Approach

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Abstract: Integration of Palembang Cultural Products in the Learning of Electrolyte and Nonelectrolyte Solutions: An Ethnopedagogical Approach. Meaningful chemistry learning can occur if students can connect new knowledge with previously owned knowledge. It is challenging for teachers to carry out a meaningful learning process by linking different students' cultural backgrounds and characters. This study used an ethnopedagogical approach in studying electrolyte and nonelectrolyte solution materials using Palembang cultural products that contain chemical aspects, namely (1) cuko (gravy) pempek contains vinegar which is a weak electrolyte solution, (2) kuah (sauce) pindang contains citric and tartaric acids, which are weak electrolytes, and (3) in the process of making Batik Palembang using caustic soda for coloring which is an example of a strong electrolyte. This research aimed to develop creative and meaningful learning methods to improve the quality of learning. This research was conducted in class X IPA 1 SMA Negeri 5 Palembang in January-March 2021. Qualitative descriptive methods and ethnopedagogical approaches were used in this research. It was carried out through five stages, namely Self Identification by conducting interviews to determine cultural background, Content Integration by providing ethnochemical articles, Collaboration by doing practicum, Dialogue by conducting discussions, and Reflection by filling in reflective journals. Based on this research, it can be seen that students can connect chemical concepts with local wisdom through cultural products. Students do not find it challenging to understand electrolyte and nonelectrolyte solution material because they use cultural products closely related to everyday life.

Keywords: Chemistry Learning, Electrolyte and nonelectrolyte solution, Ethnopedagogical approach.

Abstrak: Integrasi Produk Budaya Palembang dalam Pembelajaran Larutan Elektrolit dan Nonelektrolit: Pendekatan Etnopedagogi. *Pembelajaran kimia yang bermakna dapat terjadi jika peserta didik dapat menghubungkan antara pengetahuan yang baru dengan pengetahuan yang telah dimiliki sebelumnya. Hal ini menjadi tantangan bagi guru untuk dapat mengadakan proses pembelajaran yang bermakna, yaitu dengan mengaitkan latar belakang budaya dan karakter peserta didik yang berbeda-beda. Penelitian ini menggunakan pendekatan etnopedagogi dalam pembelajaran materi larutan elektrolit dan nonelektrolit dengan menggunakan produk budaya Palembang yang mengandung aspek kimiawi, yaitu (1) cuko pempek terkandung asam cuka yang merupakan larutan elektrolit lemah, (2) kuah pindang terkandung asam sitrat dan tartat yang merupakan elektrolit lemah, dan (3) pada proses pembuatan batik Palembang menggunakan soda api untuk pewarnaan yang merupakan contoh elektrolit kuat. Tujuan penelitian ini adalah*

mengembangkan metode pembelajaran yang kreatif dan bermakna untuk meningkatkan kualitas belajar. Penelitian ini dilakukan di kelas X IPA 1 SMA Negeri 5 Palembang pada Januari—Maret 2021. Metode deskriptif kualitatif dan pendekatan etnopedagogi digunakan dalam penelitian ini yang dilakukan melalui lima tahapan, yaitu Self Identification dengan melakukan wawancara untuk mengetahui latar belakang budaya, Content Integration dengan memberikan artikel etnokimia, Collaboration dengan melakukan praktikum, Dialogue dengan melakukan diskusi, dan Reflection dengan mengisi reflektif jurnal. Berdasarkan penelitian ini dapat diketahui bahwa peserta didik dapat menghubungkan konsep kimia dengan kearifan lokal melalui produk budaya. Peserta didik tidak merasa kesulitan dalam membangun pemahaman materi larutan elektrolit dan nonelektrolit karena menggunakan produk budaya yang lekat dengan kehidupan sehari-hari.

Kata kunci: *Larutan Elektrolit dan Nonelektrolit, Pembelajaran Kimia, Pendekatan Etnopedagogi.*

▪ INTRODUCTION

Chemistry is considered a challenging subject because there are several unique languages, complex mathematical structures, and many abstract concepts (Gabel in Keiner & Graulich, 2021). Students' number of chemical concepts that must be understood in a relatively limited time causes difficulties in learning chemical concepts (Palisoa, 2008). Chemistry learning is a lesson in which most of the topics discussed are abstract because it requires understanding at the submicroscopic level (Chen *et al.*, 2015). In line with this, Eilks (2015) states that chemistry is also considered boring for students because they cannot see the relevance of chemistry in their lives, and many students cannot apply chemical concepts in daily life. Learning chemistry concepts that are less related to everyday life can also result in the learning becoming less meaningful for students (Haristy *et al.*, 2013).

Students can link new concepts with other concepts that they have learned/basic concepts. It is in line with Piaget's opinion that knowledge is the result of human thinking processes (organizing and adapting), which are constructed from the process of experience continuously and every time a reconstruction can occur because of the new understanding gained through the learning adaptation process (Winataputra, 2007). It is challenging for teachers to carry out a meaningful learning process, namely by linking different students' cultural backgrounds and characters, especially in learning chemistry (Koballa, 2010).

Chemistry learning is a process of interaction between students and their environment to achieve the objectives of chemistry learning. Chemistry learning aims to provide students with an understanding of chemistry to use the concepts received in the actual context. Some problems in learning chemistry are caused by some of the basic concepts of chemistry being abstract, simplification is less than the actual one, must be sequential, develop quickly, emphasize students' knowledge of chemistry facts, and prodigious chemical concepts are studied (Rahmawati, 2018). Chemistry is a unified whole and cannot stand alone. That is also reinforced by the opinion of Coll R. K (2002), which states that the basic concepts in chemistry are fundamental because the next chemical concept or theory is not easy to understand if students do not own the basic concepts. In chemistry learning, the way students think is associated with students' mental models of chemical concepts is strongly influenced by cultural backgrounds. The learning carried out must be assessed as relevant.

According to Dalgety (2003), learning chemistry is studying a collection of knowledge and culture, with learning patterns to think and act transmitted through theories, skills, and values. Everyone can find chemistry in everyday phenomena such as the food we eat, the air we breathe, emotions, and the human body is a giant form of chemical compounds that bond together (Sanjay, 2016). So that chemistry learning must be linked to everyday experience. Otherwise, students will have difficulties building chemical concepts (Harrison & Treagust, 2002).

Each student is motivated by cultural differences that have a set of values, beliefs, and characters that influence the learning process in the classroom. The knowledge given to students is generally dominated by Western Knowledge, which is considered the most correct and renewable knowledge, so that students are increasingly unfamiliar with their cultural background. For example, chemistry learning materials are more likely to use chemistry examples in the modern industry from western countries rarely encountered by students in their daily lives. Based on the curriculum used at the current primary and secondary education level, it is expected to form a holistic generation in the realm of

knowledge, attitudes, and skills (Rahmawati, 2020). Learning can ultimately develop young people who have professional knowledge and skills and have character.

Culture, directly or indirectly, can provide a specific identity for individuals and their supporting communities. Local wisdom is part of a community culture that cannot be separated from its life itself. In this case, local wisdom has the following characteristics: 1) based on experience; 2) tested after centuries of use; 3) can be adapted to the current culture; 4) can be applied to the daily practice of communities and institutions; 5) commonly carried out by individuals and communities; 6) is dynamic; and 7) strongly related to belief systems (Kosasih, 2009). From these components, it shows that local wisdom deserves to be the basis of education and culture.

The ethnopedagogical approach has a vital role in building the character of the nation and culture. Ethnopedagogi views knowledge or local knowledge (local knowledge, local wisdom) as a source of innovation, and skills can empower the community's welfare. According to Alwasilah *et al.* (2009), ethnopedagogy is an educational practice in various domains and emphasizes local knowledge or wisdom as a source of innovation and skills that can be empowered for the welfare of the community where local wisdom is related to how knowledge is generated, stored, applied, managed and inherited.

The development of an ethnopedagogical-oriented chemistry learning approach is expected to provide meaningful enrichment in supporting national education goals that will shape the nation's character. Ethnopedagogy can encourage developments in the fields of education and science (Selasih & Sudarsana, 2018). In addition, ethnopedagogy can become a cornerstone in the development of a chemistry learning approach based on local wisdom. Such learning can bring teachers and students closer to the concrete situations they face to understand their own culture better to grow and pay attention to the maintenance and utilization of the surrounding natural environment (Suratno, 2010).

One of the chemistry learning materials in class X SMA in the 2013 curriculum, namely electrolyte and nonelectrolyte solutions. The material for electrolyte and nonelectrolyte solutions is complex for students because it requires understanding at the submicroscopic level (Fitriyani *et al.*, 2019). Several studies have shown that students have a shared conceptual understanding of electrolyte and nonelectrolyte solutions (Rahayu *et al.*, 2011). One solution to improve the concept of electrolyte and nonelectrolyte solutions for students is an ethnopedagogical approach. There have not been many studies on electrolyte and nonelectrolyte solution materials that relate chemical concepts to real-life through culture. Research conducted by Rahmawati *et al.* (2020) shows that the integration of ethnopedagogy in the learning of electrolyte and nonelectrolyte solutions can develop students' chemical literacy, understanding of chemical concepts, and cultural identity in chemistry learning.

Palembang culture has its uniqueness concerning culture-based learning. Cuko (gravy) pempek, pindang sekayu as processed fish culinary, and Palembang batik are some of the products that characterize Palembang culture. The three cultural products contain chemical aspects, namely electrolyte and nonelectrolyte solutions, because, in the processing of these products, there are several ethnochemical elements from the main ingredients used.

According to Suratno (2010), ethnopedagogy can be seen as a relationship between the term culture or character (ethno aspect) and teacher education (pedagogical aspect). Alwasilah *et al.* (2009) stated that ethnopedagogy focuses on local genius and local wisdom by expressing local cultural values as an initial approach in the context of the

culture in general. It can be said that ethnopedagogy looked at knowledge or local knowledge (local knowledge, local wisdom) as a source of innovation and skills that can be empowered for the welfare of society.

In the perspective of education, Alwasilah *et al.* (2009) and Kartadinata (2010) view that education cannot be separated from social and cultural aspects. Ethnopedagogy as an educational practice based on local wisdom is in line with the findings of Alexander (2000), which shows that there is a close relationship between pedagogy and the socio-cultural life of the community. Based on an analysis of the dimensions of culture and education, ethnopedagogy as an educational practice based on local wisdom in various domains and emphasizes local knowledge or wisdom as a source of innovation and skills that can be empowered for the welfare of the community, namely local wisdom related to how knowledge is generated, stored, applied, managed and inherited.

One form of anticipating the loss of national culture and traditions due to globalization is applying ethnopedagogy learning in the chemistry learning process in the classroom. This learning integrates chemistry in schools with local traditions and cultures that have been developed in Brazil, Canada, and Tanzania (Ruheza *et al.*, 2013). It is also confirmed by Castell (2004) which states that the chemistry learning process must be integrated with culture and tradition because the meaning of a nation's identity is built through culture as a fundamental element.

Gunstone (2014) also carried out this learning development, who discussed concepts and principles in science material and then linked them to phenomena in everyday life. Michell (in Sarwanto *et al.*, 2010) found that the science learning curriculum developed in local culture increased the attitude of nationalism. The advantage of this learning is that it can be used as a facility for students to form meaningful learning. Here is because students can relate chemistry learning to local culture and traditions to attract students' interest. In addition, students can understand chemical concepts associated with everyday life (Taber, 2002). The cultural background of students has a more significant effect on the educational process if incorporated into the learning process in the classroom (Sumarni, 2016). That is because students have spent their time in an environment influenced by community culture rather than formal education theory.

The implementation of the 2013 curriculum directs teachers to develop learning approaches to be more effective and preserve their culture. According to Klara (2015), ethnopedagogy is related to ethnic background. Ethnopedagogy helps students develop the right attitude towards the nation's cultural values (Akhmetova, 2014). This study integrates Indonesian cultural education, especially in Palembang culture, with electrolyte and nonelectrolyte learning in high school. Elements of ethnopedagogy that are applied will study the concept of chemistry from a cultural perspective.

Five stages of ethnopedagogical learning are integrated into project-based learning (Rahmawati *et al.*, 2020). The following are the five steps of the learning stages:

1) Self Identification
   Recognition and understanding of culture through the process of self-identification.
2) Content Integration
   Discussions related to chemistry and culture articles among group members.
3) Collaboration
   Implementation of cultural science projects carried out in collaboration with group members.

4) Dialogue
   Implementation of discussions with group members and teachers about the results of the joint work that has been done to get suggestions and input for improvement.
5) Reflection
   Implementation of reflection and evaluation of learning outcomes such as knowledge, attitudes, and values obtained in learning.

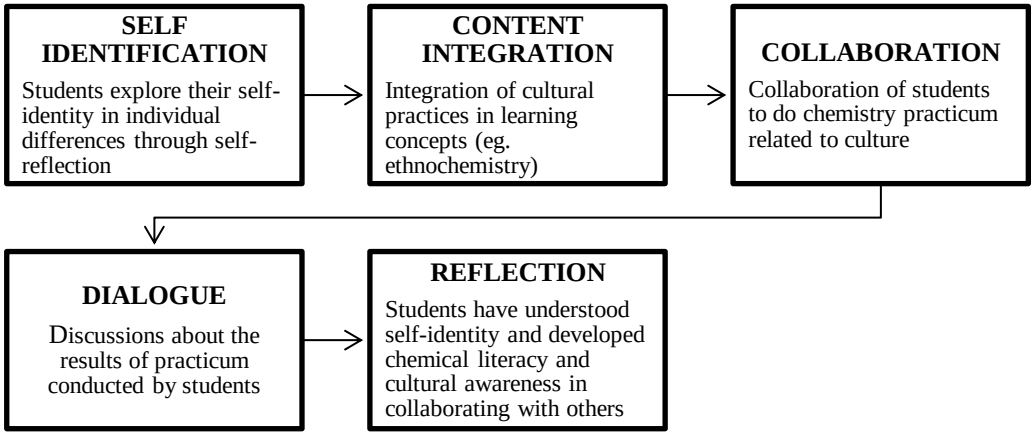

Figure 1. Stages of Project-Based Ethnopedagogy Learning (Rahmawati, 2020)

The advantage of this approach is that it can be used as a facility for students to form meaningful learning. Students can relate chemistry learning to local culture and traditions that can attract students' interest. In addition, students can understand chemical concepts associated with everyday life (Taber, 2002). The cultural background of students has a more significant effect on the educational process if incorporated into the learning process in the classroom (Sumarni *et al.*, 2016). Students have spent their time in an environment created/influenced by community culture rather than formal education theory.

Based on the problems described above, the formulation of the problem in this study integrates Palembang cultural products in electrolyte and nonelectrolyte solutions for students at SMA Negeri 5 Palembang ethnopedagogical approach. The benefits of this research are expected to provide consideration for increasing innovation regarding the use of cultural products to support a quality learning process in chemistry. In addition, teachers can develop more creative and meaningful learning methods to improve the quality of learning and see the learning process from another perspective regarding the learning process linked to local cultural products.

▪ METHOD

The research method used is qualitative. The applied qualitative research aims to find and describe students' responses after implementing distance learning using an ethnopedagogical approach. The data obtained in this study came from discussions in ethnopedagogical articles, interview transcripts, observation sheets, practicum worksheets, and reflective journals. Observation sheets, reflective journals, and interviews were conducted at each meeting with additional interviews after the literacy test. The learning of electrolyte and nonelectrolyte materials in class X IPA 1 at SMA Negeri 5 Palembang was conducted in 3 online meetings to complete five stages of

learning with an ethnopedagogical approach, with details (1) Self Identification and Content Integration; (2) Collaboration and Dialogue; (3) Reflection. The research subjects were 36 students of class X IPA 1 SMA Negeri 5 Palembang, which consisted of 10 male students and 26 female students. The research subjects were determined based on the availability of researcher access permitted by the school through the curriculum representative.

This research procedure consists of several stages, namely initial activities, core activities, and final activities. In the initial activities, the process carried out is identifying problems, compiling learning tools, compiling research instruments, understanding research contexts, and applying for research permits. Based on the core research activities, namely student interviews, implementation of learning, and evaluation of learning. The end of the activity includes data analysis and concluding.

All the data that has been obtained will be analyzed systematically to get a conclusion. In this study, the data analysis technique refers to the Miles and Hubermen (1994) model, which includes three processes: reducing data, presenting data, and making conclusions. Qualitative data analysis is carried out interactively and takes place continuously until it is complete so that the data is saturated.

The validity of research data is essential to gain the trust and recognition of the findings. Test the credibility of the data in this study using the technique of Trustworthiness or trust with the criteria of credibility (internal validity). Credibility is also called trust in data from qualitative observations, prolonged engagement, persistent observation, progressive subjectivity, and member checking (Lincoln and Guba in Salim, 2012).

▪ RESULT AND DISCUSSION

Chemistry learning that is carried out is oriented to students' activeness with the teacher as a facilitator with the completion of competency achievement indicators (IPK) in basic competence (KD) 3.7, namely analyzing the properties of solutions based on their electrical conductivity. Focusing on theoretical learning, chemistry teachers always train students through practical skills tailored to the subject matter. It can make students more enthusiastic about learning chemistry.

Learning at each meeting emphasizes contextual learning by connecting learning materials to everyday life. The ethnopedagogical approach improves chemical literacy skills because of its contextual nature (Cigdemoglu & Geban, 2015). Learning with an ethnopedagogical approach is also not oriented to memorization but is directed to learning that links concepts into a context (Broman, 2018).

One way to learn ethnopedagogy is by giving ethnochemical articles. Ethnochemistry articles act as learning media. Before the article is given to students, validation is carried out first using a questionnaire (score 1-4). The assessment of the ethnochemical articles used includes the chemical concepts contained in cultural products in everyday life (conceptualization), the accuracy of the preparation of content to the learning context (informative), the attractiveness of the content, and appearance of the article (interesting), developing students' critical thinking skills (critical thinking), and the use of language (grammar).

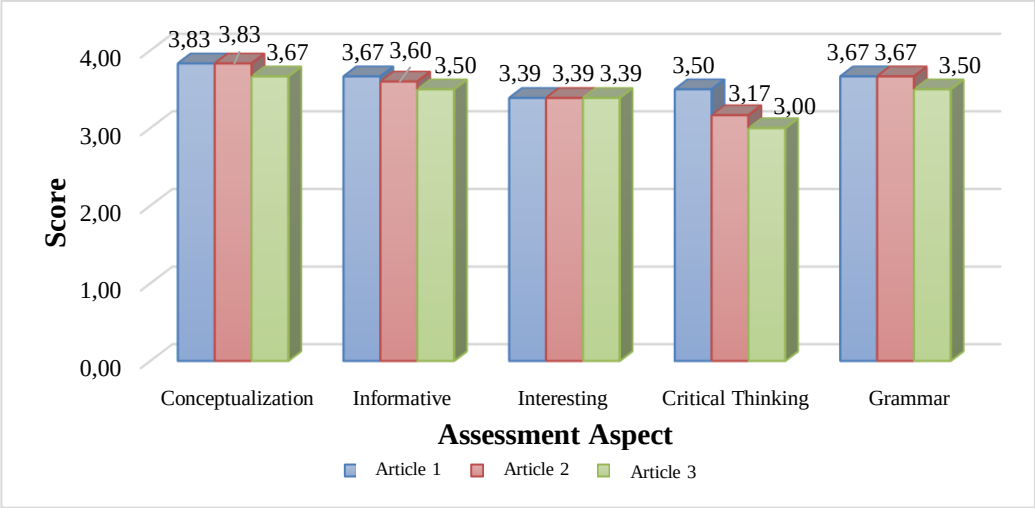

Figure 2. Histogram of grading of ethnochemical articles

Based on Figure 2, the ethnochemical articles used in this study have good scores on each indicator. The validators revealed that ethnochemical articles could be used as learning media in an ethnopedagogical approach to electrolyte and nonelectrolyte solutions. It can be seen from the score results of the validators who show promising results (more than 3.00). In addition, the language used is easy to understand, so that these three articles can be given to students. The table below shows how cultural products are integrated into chemical concepts, especially electrolyte and nonelectrolyte materials that students learn at school.

Table 1. Integration of cultural products with the concept of chemicals in electrolyte and nonelectrolytes solution

No.	Article	Cultural Products	Integration
1.	Chemistry in Cuko Pempek	Cuko Pempek (Acetic Acid in Cuko Pempek)	Most manufacturers cuko pempek using a cid acetate as the source of the acid, which in the language of the market is locally referred to as the vinegar diction (Muchsiri *et al.*, 2016). Acetic acid is one of the applicable products of electrolyte and nonelectrolyte solutions in everyday life.
2.	Electrolyte Solution in Pindang Sauce	Pindang sauce (Javanese Sour in Pindang Sauce)	Usually in tamarind sauce of caramelized used to give a sense of the typical sour fresh (Pratama, 2021). The content in tamarind is one of the applicable products of electrolyte and nonelectrolyte solutions in everyday life.
3.	Soda Ash in Palembang Batik	Palembang Batik (Sodium Carbonate in the *lorodan* process)	The release of batik wax can be made by making *lorod*, and hot water made more alkaline to dissolve the wax. *Alkaline lorodan* water can be obtained by adding soda ash to *lorodan* water (Haryanto, 2008). Soda ash is one of the applicable products of electrolyte and nonelectrolyte solutions in everyday life.

After validation of the article, the researcher carried out the learning stages with an ethnopedagogical approach. Five stages of ethnopedagogical learning are integrated with project-based learning, namely Self-Identification, Content Integration, Collaboration, Dialogue, and Reflection (Rahmawati *et al.*, 2020).

Self Identification

The first stage in this learning process is to identify the background of the students. This stage aims to determine the cultural background, conditions of chemical literacy, and the learning process carried out in the classroom. At this stage, interviews were conducted with the chemistry teachers of SMA Negeri 5 Palembang and students in class X IPA 1. The researchers gave presentations on the basic concepts of electrolyte and nonelectrolyte solutions. In line with Rahmawati's research (2020), the teacher gives several questions related to the students themselves in the early stages of learning. This question is given so that students can know and understand themselves before learning.

From the results of student interviews, students already know their cultural background. It can be seen from the students being able to mention and describe the cultural products of Palembang. However, they do not know the culture product's chemical content and have difficulty classifying electrolyte and nonelectrolyte solutions.

Researcher *: "Do you know the composition of chemicals used in Palembang cultural products?"*

Student 34 *: "Cuko doesn't know, Sir. If it's pindang I mentioned earlier. Ginger, laos, turmeric, tamarind. Batik doesn't know either, Sir."*

(Interview, February 13, 2021)

"I know the basics about cultural products of Palembang, Sir. Especially the characteristic, maybe what Palembang is famous for. The food is pempek, tekwan, model. And other cultures such as songket, the Ampera bridge, Monpera, there is also Kuto Besak, which is rich."

(Student 8, Interview, February 13, 2021)

The condition of literacy is known from the results of interviews with teachers and students. According to teachers, learners' literacy condition varies (low, medium, and high) in one class. It is because there is no classification in determining the class. In addition, according to students, the literacy condition of students in class X IPA 1 is moderate. It can be seen that SMA Negeri 5 Palembang has implemented a literacy policy for students, namely the assignment of making lesson resumes every week and must be collected. However, this policy is not practical consistently because it only occurs at the beginning of the learning year, even though it increases student literacy.

"It varies… So some of them are already doing well, some are moderate, some are low. Overall is moderate. Not too low, but not too high."

(Chemistry Teacher 3, Interview, January 18, 2021)

"I didn't work on it anymore. It was like being told to make a chart of the development of COVID so far, made a poster. The first one was also told about flooding in the Indonesian area. So I have to read the news and read books too…"

(Student 8, Interview, February 13, 2021)

The learning process during the pandemic takes place online. The teacher provides materials and assignments via the *Zoom* application. Based on the observation that researchers did, the tasks assigned by the teacher have not dug the literacy skills of learners for the task given is not touching C3 levels (analyze) in Bloom's taxonomy.

> "For those who analyze it, it is not rich. Just a matter of course examples wrote and then the theories were like that."
>
> (Student 8, Interview, February 13, 2021)

Students were interviewed regarding their knowledge of their cultural background and their chemical literacy. Below are examples of student answers in the self-identification process:

> "I know and are familiar with some of the culture of Palembang, Sir. Pempek and pindang have become a daily breakfast. I never cook. The spices are turmeric, ginger, laos. Then the most important thing is to make the taste sour."
>
> (Student 34, Interview, February 13, 2021)

Based on the Self Identification stage, it can be seen that students already know their cultural background as the people of Palembang. Student literacy is classified as moderate because learning does not touch the level of analysis, and the learning process is not contextual.

Content Integration

The second stage in the ethnopedagogical approach is Content Integration. This stage aims to integrate cultural products into chemical concepts at the first meeting. The participants reviewed the three ethnochemical articles given at this stage, namely cuko pempek, pindang sauce, and soda ash in Palembang batik.

The integration of cultural products in the chemical concept includes the composition of cuko pempek. It contains vinegar (a weak electrolyte solution), Pindang Sekayu contains citric and tartaric acids, which are weak electrolytes, and in the batik-making process, using caustic soda for the plorodan process, which is an example of a strong electrolyte. Based on the description, it can be seen that the three cultural products contain electrolytes and can be integrated with chemical concepts.

The activity of students in this stage is to study articles in groups on Palembang cultural products that are integrated with chemical concepts. The activities carried out include reading articles, answering questions in the article, presenting an understanding of the article's content and answers to questions based on group discussions, and giving each other responses to other groups' answers. Students must read and discuss articles that integrate the concepts of electrolytes and nonelectrolytes and the culture that occurs in everyday life. Understanding of cultural integration in chemistry learning, according to students as follows:

> "I understand that the manufacture of vinegar for cuko pempek, soda ash, and pindang also use materials chemistry."
>
> (Student 19, Reflective Journal 2, February 10, 2021)

> "Learning chemistry is an inspiring day for the presentation of each group and also we've got a new insight about the culture."
>
> (Student 10, Reflective Journal 2, February 10, 2021)

> "Much to know more in the culture of the fields of chemistry."
>
> (Student 13, Reflective Journal 3, February 20, 2021)

"Trying to pay attention to the teacher's explanation and look for other learning resources to understand the subject better. "

(Student 34, Reflective Journal 2, February 12, 2021)

This research indicates that the integration of ethnopedagogy in chemistry learning can increase students' curiosity about the relationship between cultural products and chemical concepts, their cultural understanding identity, and their understanding of chemical concepts.

Collaboration

The collaboration stage is an activity to develop student's problem-solving skills by working together on problems that are difficult to solve individually (Alves, 2007). The purpose of the Collaboration stage in the ethnopedagogical approach is that students can provide feedback on one another and learn from each other from different experiences.

Students experiment about the electrical conductivity of the solution with several samples, one of which uses cuko (which is commonly used in Palembang specialties, namely pempek).

(Observer 2, Observation Sheet, February 20, 2021)

Each group is also creative in doing some experiments on other solutions that are easily found in everyday life such as Yakult, UC- 1000, Isoplus, Cimory, and Pocari.

(Observer 3, Observation Sheet, February 20, 2021)

"Very enjoyed once since been held practicum and today had a discussion, so I felt understand the subject. From the practicum, so I find out and read and read a book other ... about cuko."

(Student 34, Reflective Journal 3, February 20, 2021)

At this stage, students collaborate to work on practicum in groups. The purpose of the practicum at this stage is to (1) determine the type of electrolyte and nonelectrolyte solutions and (2) and classify the solutions into solid electrolytes, weak electrolytes, or nonelectrolytes using a simple electrolyte test apparatus. Each group can be creative on the test equipment, the practicum materials used, and the results of the practicum activities. When students do a practicum, some groups use various practicum materials, such as drinks or solutions that they often encounter in everyday life. Students can develop creative and critical thinking at this stage, solve problems in groups, and improve students' communication skills.

At this stage, students learn to complete projects in groups. Worksheets and interview statements from students have shown that this project develops students' abilities to engage with one another, evaluate their ideas, and monitor their work together. In addition, students also understand their role in groups and how to build collaboration skills. The results of the Collaboration stage from the ethnopedagogical approach that has been carried out are that students can produce practical videos in classifying robust electrolyte solutions, weak electrolytes, and nonelectrolytes using solutions found in everyday life.

Dialogue

The next step in this research is the Dialogue stage. At this stage, all students' activities are presentations and discussions conducted by all students based on the results of studies of articles and practicums. This learning activity is designed to improve student's communication skills and understanding of chemical concepts.

> *The teacher asks some questions to the students, and the students answer them well so that there is an active learning process.*
>
> (Observer 1, Observation Sheet, February 10, 2021)

> "Even though we don't meet face-to-face, we can still have virtual discussions, Sir. With the multiply discussion, e.g., seems like yesterday working group to be known much friends, Sir. We are getting close."
>
> (Student 34, Interview, February 10, 2021)

At this stage, each group presents the results of their article discussions and their practicum results to explain the types of electrolyte and nonelectrolyte solutions and classify these solutions into solid electrolytes, weak electrolytes, or nonelectrolytes. Students can ask questions and give reviews to other groups. At this stage, students can understand the types of electrolyte and nonelectrolyte solutions and classify them based on experiments with proper explanations.

The result of this stage is an increase in students' communication skills. It is known that the explanation of the material by the students delivered well when discussing because they already have experience gained when explaining basic concepts to practicum. Students can convey well using their language because students' literacy of the material has increased. In addition, students look enthusiastic about asking or answering questions at this stage.

Reflection

The last stage of the learning process with this ethnopedagogical approach is reflection. The teacher, as a facilitator, directs students to evaluate the learning process. Students can fill in several questions about their changes after learning with an ethnopedagogical approach through reflective journals. The following is a snippet of journal reflection.

> "Good, learning while continuing to preserve regional cultures. can solve the problem together because working together"
>
> (Student 36, Reflective Journal 3, February 20, 2021)

> "I really could be associated in the study because of a culture can we do in the experiment as testing a solution in the food if there is power conductivity of electricity or not."
>
> (Student 18, Reflective Journal 3, February 20, 2021)
>
> "I like the practical part of the electrolyte solution because I can immediately observe what happens and changes in the solution. Improved my chemistry literacy too, Sir…"
>
> (Student 18, Interview, February 2 3 2021)

Based on the stages in the ethnopedagogical approach, students are directed to apply problem-solving skills in their lives. According to Osman (2018), problem-solving is an

essential skill for students. Chemistry problem solving helps students in solving problems in everyday life by applying chemical skills and knowledge.

Problem-solving that students must solve is to analyze the nature of the solution based on its electrical conductivity. However, students have difficulty in classifying known electrolyte and nonelectrolyte solutions during the Self Identification stage. Therefore, the researchers conducted learning with an ethnopedagogical approach. The ethnopedagogical approach is carried out using Palembang cultural products so that learning becomes contextual. The steps taken are explaining the basic concepts of the material, reviewing articles, and doing practicals. The result of learning with an ethnopedagogical approach is that students can solve problems and improve chemical literacy.

Learners also complete a reflective journal at the end of each meeting to evaluate their understanding during the learning process. The reflective journal filled out by students at the end of each meeting evaluates students' understanding during the learning process. Based on this research, it is known that students who participate in problem-based learning activities using an ethnopedagogical approach have succeeded in increasing their ability to remember information about the concepts of electrolytes and nonelectrolytes as well as related cultural aspects, which ultimately lead to meaningful learning.

Basic competence (KD 3.7) in electrolyte and nonelectrolyte solution material has been achieved by completing several Competency Achievement Indicators (IPK) in KD 3.7 implemented in the Implementation of Learning Materials for Electrolyte and Nonelectrolyte Solutions with an Ethnopedagogical Approach.

Table 2. Implementation of KD and GPA on an ethnopedagogical approach

	Basic competencies	Indicators of Competency Achievement	Ethnopedagogical Approach Stage
3.7	Analyze the properties of solutions based on their electrical conductivity.	3.7.1 Explain the meaning of electrolyte and nonelectrolyte solutions	*Self Identification* Stage (Meeting 1)
		3.7.2 Give examples of electrolyte and nonelectrolyte solutions	*Content Integration* Stage (Meeting 2)
		3.7.3 Classifying the properties of electrolyte and nonelectrolyte solutions	
		3.7.4 Analyze solutions of vital electrolytes,	

	weak electrolytes, and nonelectrolytes based on their electrical conductivity	*Collaboration* & *Dialogue* Stage (Meeting 3)
3.7.5	Analyze the causes of electrolyte solutions that can conduct electric current	
3.7.6	Comparing the types of chemical bonds with the ability to conduct electric current	
3.7.7	Designing electrical conductivity experiments of several solutions	

DISCUSSION

The ethnopedagogical approach facilitates the cultural and social awareness of learners. Analysis of students' cultural identity was obtained from interview data, reflective journals, and student identification worksheets. Nearly every aspect of the approach ethnopedagogy can support the establishment of social and cultural awareness that includes empathetic communication, responsible, disciplined, and social care (Altugan, 2015). One of the ethnopedagogical approach characteristics is that paying attention to students' cultural background and character can stimulate the emergence of social awareness (Rahmawati *et al.*, 2020). Culture learners give effect to the way learners identify themselves (Rahmawati & Taylor, 2018). According to Rahmawati *et al.* (2019), learning with this ethnopedagogical model can also develop students' awareness of their culture.

Based on the research, learning with an ethnopedagogical approach can run well. Students are enthusiastic about carrying out learning by discussing and debating. Based on Rahayu's research (2019) that the application of contextual learning, including an ethnopedagogical approach, will foster students' chemical literacy skills which are marked by the growth of investigative skills such as asking questions, collecting data and evidence, analyzing data, making conclusions, teamwork, communication (arguments/explanations). Scientific), problem-solving, and can develop practical aspects that can be curiosity, interest, and moral awareness.

▪ CONCLUSION

This research was conducted by integrating chemistry in learning electrolyte and nonelectrolyte solutions with Indonesian culture, namely Palembang cultural products. In this study, integrating chemical concepts into the cultural context is carried out through an ethnopedagogical approach through five stages. In the *Self Identification* and *Content Integration* stages, learning materials for electrolyte and nonelectrolyte solutions are given to students. Next, students examine the ethnochemical articles given, namely Cuko pempek, Pindang sauce, and Soda Ash in Palembang Batik. In the *Collaboration* and *Dialogue* stages, students do practical work using local cultural products. Students present the results of practicum activities through videos and discuss the practical experience of each group. The *Reflection* stage is carried out by reflecting and evaluating learning outcomes such as knowledge, attitudes, and values obtained in learning. The reflection process was carried out by interviewing and reflective journaling at each meeting. According to students, learning about electrolyte and nonelectrolyte solutions with an ethnopedagogical approach that uses local cultural products is fun. It makes learning more contextual and meaningful even during online learning.

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