

Implementation of Islamic Education Concept in Ethnochemistry

Dwi Wahyudiati^{1*}

¹Universitas Islam Negeri Mataram, Nusa Tenggara Barat, Indonesia

*email: dwiwahyudiati@uinmataram.ac.id

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ABSTRACT

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The concept of Islamic education requires more than just a theoretical understanding. It concentrates only on Islamic studies because of the difficulties in using a chemical perspective to understand the concepts. Therefore, this study aims to implement an Islamic education concept in ethnochemistry using Sasak traditional wisdom. It uses qualitative methodologies such as observation, in-depth interviews, documentation, and curriculum analysis to obtain data. The results show that ethnochemistry based on the local wisdom of the Sasak tribe has a strong relationship with the Islamic education concept, especially in the merarik (marriage) ceremony. A fundamental part of Islamic education is a belief in the need for mutual respect, cooperation, open debate, and consensus, reciprocal give and take, collaboration, and the necessity for stability. These ideas are also very relevant to the chemical bond theory, which includes concepts such as electron stability, electron configuration, positive and negative ion formation, as well as chemical bond formation. Therefore, ethnochemistry based on Sasak local wisdom can be considered relevant to the Islamic education concept. Acknowledging intellectually and ethically intelligent students is essential to achieving national education goals.

Keywords: *Implementation; Islamic Education Concept; Ethnochemistry; Sasak Local Wisdom*

ABSTRAK

Memahami konsep pendidikan Islam membutuhkan lebih dari sekedar pemahaman teoritis. Namun, kesulitan umum adalah bahwa pemahaman prinsip-prinsip Islam jarang ditangani dari sudut pandang kimia, sehingga konsep pendidikan Islam hanya berfokus pada bidang studi Islam. Tujuan dari penelitian ini adalah untuk melihat bagaimana konsep pendidikan Islam diimplementasikan dalam etnokimia dengan menggunakan kearifan adat Sasak. Penelitian ini menggunakan metodologi penelitian kualitatif seperti observasi, wawancara mendalam, dokumentasi, dan analisis kurikulum untuk memperoleh data. Hasil penelitian ini menyoroti fakta menarik yaitu etnokimia yang berbasis pada kearifan lokal suku Sasak memiliki kaitan yang kuat dengan konsep pendidikan Islam, khususnya dalam upacara *merarik* (pernikahan). Saling menghargai, gotong royong, debat dan mufakat, saling memberi dan menerima, kerjasama, saling menghormati, dan konsep saling membutuhkan untuk membangun stabilitas, yang merupakan konsep inti dalam pendidikan Islam, termasuk di antara prinsip-prinsip sosial, moral, dan spiritual yang ditemukan dalam tradisi undian. Ide-ide ini juga sangat relevan dengan teori ikatan kimia, yang mencakup konsep-konsep seperti stabilitas elektron, konfigurasi elektron, ion positif dan negatif, dan teori pembentukan ikatan kimia, sehingga

etnokimia berbasis kearifan lokal Sasak dapat disimpulkan relevan dengan konsep pendidikan Islam. Sebagai bagian dari pencapaian tujuan pendidikan nasional, perlu dikenal peserta didik yang tidak hanya cerdas secara intelektual, tetapi juga cerdas secara moral, sosial, dan spiritual.

Kata-kata Kunci: Implementasi; Konsep Pendidikan Islam; Etnokimia; Kearifan Lokal Sasak

1. INTRODUCTION

Ethnochemistry is studying or applying a chemical concept in a tradition or culture (Singh & Chibuye, 2016). It refers to individuals in the community environment identified through cultural traditions, symbols, codes, products, and myths to consider and conclude a concept (Rosa & Clark, 2011). As a result, using cultural goods as learning materials is quite feasible as one implementation of contextual learning that refers to students' everyday life activities, making the concept taught easier to understand. The previous study showed that implementing this concept in learning activities affects students' cognitive, affective, and psychomotor learning outcomes (Sumardi & Wahyudiati, 2021; Sutrisno et al., 2020). However, the utilization of cultural artifacts as learning tools is still uncommon, hence, learning objectives are not met properly (Sumardi et al., 2020; Wahyudiati et al., 2019).

Educators could enhance learning outcomes by focusing more on cognitive development and less on emotional and psychomotor factors, often neglected. Cognitive, affective, and psychomotor aspects can be developed through integrating Islamic aspects, local wisdom, as well as moral and spiritual values in teaching chemistry and carrying out learning or practicum activities to optimally achieve learning outcomes (Fadli & Irwanto, 2020; Sungkharat et al., 2010; Villafañe & Lewis, 2016; Wahyudiati, 2016). Efforts can be made to integrate Islamic aspects, local wisdom, as well as moral and spiritual values through the implementation of ethnochemistry based on Sasak local wisdom (Sumardi & Wahyudiati, 2021; Sutrisno et al., 2020).

The implementation is one form of integrating Islamic education concepts with local wisdom, moral, and spiritual values as learning objectives. However, due to a division between science and religion, investigations integrating the scientific method with Islamic educational practices are still rare (Fadli, 2018). The lack of integration impacts the low achievement of affective learning outcomes or attitudes, which is reflected in the lack of development of students' moral, social, and spiritual values (Wahyudiati, 2021). This problem is very relevant to the previous study, which proves that integrating science and technology with Islamic religious education can make the learning more meaningful and easily understood (Chanifudin & Nuriyati, 2020). Related problems are still limited to the integration with the

science field in general, and the integration of an Islamic concept with a chemical concept has not been conducted using an ethnochemical approach. Therefore, this study is critical to be carried out as a first step to examining the integration, interconnection, and internalization between various disciplines, such as the integration of chemistry, social science, religion, and culture in the curriculum.

The Sasak Lombok tribe has diverse cultures, traditions, local languages, and religious ceremonies. The diversity of customs is manifested in patterns of thought, behavior, and attitudes that contain noble cultural, wisdom, moral, social, and spiritual values in the implementation of Islamic education (Fadli, 2018; Sumardi & Wahyudiati, 2021; Suprpto, 2017). According to Imam Al-Ghazali, studying science is a form of worship to Allah SWT as a means of forming *akhlakul karimah* (noble characters) (Fadli, 2018). Islamic education aims to deliver students to achieve happiness in the world and the hereafter (Musrifah, 2016).

One value of local wisdom, which is also a manifestation of the local Islamic wisdom in the Sasak tribe, is the *merarik* tradition with a series of events such as *nenarih* (ask), *sorong serah ajikrame* (family consultation), *nyongkolan* (visit to women's houses), and *begawe* (traditional party). The values contained in Sasak local wisdom include cooperation, mutual sharing, mutual respect, mutual give and take, as well as the responsibility to achieve peace and happiness.

Sasak tribal values, such as local and local Islamic knowledge, are closely related to the chemical bond theory as an ethnochemical application of the Islamic education concept (Sutrisno et al., 2020). Therefore, this study aims to examine the relevance of chemical bond theory to the Islamic education concept based on the concepts of ionic bond formation, positive and negative ion formation, as well as electron pair transfer to achieve stability. It is critical to be carried out as a first step to examining the integration, interconnection, and internalization between various disciplines such as science, social studies, religion, and culture in the curriculum. Therefore, future generations of students will be academically, ethically, socially, and spiritually intelligent due to contextual learning in the curriculum.

2. METHOD

This study uses a descriptive qualitative approach to obtain data from written words and observable individual or community behavior supported by literature studies (Sutrisno et al., 2020). Data collection techniques used are observation, in-depth interviews, and documentation studies. Furthermore, the three instruments used are (1) observation sheets for collecting data related to cultural products or traditions of the Sasak people that have relevance to chemistry and Islamic education concepts; (2) guidelines as a guide in conducting interviews with respondents to

strengthen the data from the observations; and (3) documentation for collecting data sourced from the scientific literature that discusses the chemistry concept, Sasak culture, and Islamic education in the form of books, articles, and documents. Data collection activities explore local Sasak wisdom by referring to the ethnochemical approach. The literature studies carried out are to (a) investigate the relevance of Sasak local wisdom values to the chemical concept through an ethnochemical approach, (b) examine the relevance of Sasak local wisdom-based ethnochemistry with the Islamic education concept, and (c) analyze various previous studies as a reference source. Subsequently, Miles & Huberman's analysis technique, including reduction, presentation, and the conclusion was used to analyze data (Creswell, 2014).

3. RESULTS AND DISCUSSION

a. The Merarik (marriage) Tradition of the Sasak Lombok Tribe

Some cultures and customs of the Sasak tribe have meanings or are analogous to the concept of chemical bonds, such as an ionic bond formation, positive and negative ion formation, and electron pair transfer to achieve stability (Fadli, 2018). The *merarik* (marriage) tradition in the Sasak community consists of *memaling* (a woman is brought to be married) and *belako'* (asking for a woman to be married) (Budiwanti, 2000).

The order of marriage customs and ceremonies is as follows: 1) *Nenarih* or *beketoan* (ask), the question of whether or not a man and a woman are ready to get married should be asked at this point. Such questions are asked directly by the man or their *subandar* or *jerumannya* called *Nenarih*. 2) *Sebo'* or hide when a lady is taken from her home, she is placed in the care of family or friends who will keep her concealed from prying eyes. In these conditions, the woman and her future husband are bound by customary rules, such as not being seen by the woman's family, and will get deosan or customary sanctions in the form of fines when violated. 3) *Sejati*, after the woman is successfully brought, people perform *sejati* one or two days later. The tradition is to tell the parents or bride that a man has brought their child, and this notification is made by two men wearing traditional clothes. 4) *Selabar*, this tradition is the stage of marriage after *sejati*. It is carried out by a *pembayun* whose job is to talk about the amount of dowry, *aji adat*, *aji krama*, and other traditional rituals. 5) *Sorong serah* is the tradition of handing over all fees carried out in a ceremony. This ritual is performed before the prospective husband and wife signing the Islamic marriage contract. This is meant to prevent future issues after receiving guardianship and without paying the standard fee. Muslims are permitted to wed as soon as their *sorong serah* rite is

complete. 6) *Nyongkolan*, this tradition comes from the word *songkol* or *nyondol*, which means to accompany. In this context, accompanying implies following the couple to keep in touch with the bride's family after the wedding. The man's family carries out *Nyongkolan* to meet with the woman's family, accompanied by traditional Sasak music such as *Gamelan Beleq*, *Kecimol*, *Tawak-Tawak*, and *Kedodak*. The purpose is to ask for the blessing of the woman's family as a sign that their daughter has been officially brought by her husband.

Merarik (marriage) can integrate the chemical bond concept and the Sasak local wisdom values. The ethnochemical method can be used in education by incorporating a chemical concept into the local culture. Ethnochemistry is the application of a chemical concept or practice with a chemically related tradition or culture identified in a society's tradition or culture. One implementation of this approach in learning can be carried out through culture integrated with the chemical concept in the form of learning resources. The previous study stated that ethnochemistry-based learning resources could be in the form of textbooks, reference books, and practical instructions and act as natural laboratories (Singh & Chibuye, 2016).

The use of cultural products as learning resources is one implementation of contextual learning that refers to the daily life activities of students. The previous study stated that implementing ethnochemistry in learning activities affects students' cognitive, affective, and psychomotor learning outcomes (Sumardi & Wahyudiati, 2021; Sutrisno et al., 2020). Furthermore, a chemical concept can be combined with Sasak local wisdom and the Islamic education concept. The electron pair handover concept to achieve stability or perfection relates to the Islamic education. According to Al-Ghazali's concept of thought, the success of education will be realized through the formation of human beings who have good morals, hence happiness can be achieved in this world and the hereafter (Djaelani, 2013). Furthermore, the heart is the most crucial part of a creature that focuses on developing noble character (*akhlakul karimah*). The reflection of *akhlakul karimah* is identified through cooperation, respect, tolerance, and give and take to achieve mutual prosperity (Fadli, 2017).

b. Analyzing the Implementation of Islamic Education Concept in Ethnochemistry Based on Sasak Local Wisdom

The processions relevant to the ionic bond formation theory are *nenarih*, *sorong serah*, and *nyongkolan*. In the Sasak community, marriage is the primary condition for obtaining rights and obligations in a relative group, such as the right to inherit. It also denotes uniting two prominent families, the man's and the woman's relatives.

The relationship between the *merarik* tradition and the ionic bond formation is analogous (with the same meaning) with *nenarikh*. *Nenarikh* is a tradition of asking for a woman's willingness to be ready for marriage. This is asked directly by the prospective groom or representatives known as *subandar* or *jerumannya* (Wahyudiati, 2020). The underlying similarity is based on the concepts of needs and give and take, hence stability is realized through unification in the marriage bond (Fadli, 2018). In the theory of ionic bond formation, the underlying concept is the transfer of electron pairs between positive and negative ions. As a result, a stable electron configuration of noble gases or group VIII A is formed (Prasatiawan, 2009) through the transfer of the electron pair to achieve stability (Morgong, 1988).

There is a tendency for an atom to reach stability by bonding with another (Achamad, 2001) to achieve a noble gas configuration. This is achieved by releasing or giving electrons in their outer shell to form positive or negative ions (Achamad, 2001). The concept of handing over electron pairs to achieve stability has relevance to the concept of Islamic education. The primary purpose is under Al-Ghazali's concept of thought, which emphasizes that the success of education will be realized through the formation of human beings who have good morals (Djaelani, 2013; Fadli, 2017). Furthermore, the primary key in education is the heart which is the most critical essence of a creature. Hence the concept is more directed or focused on the formation of noble character. The reflection is identified through mutual help, tolerance, and giving and receiving to achieve mutual prosperity (Fadli, 2017). The concept of ionic bond formation is closely related to the mutual need to attain stability through reciprocal give-and-take, founded on the principle of complementarity. It occurs through the transfer of electron pairs to achieve stability (Sutrisno et al., 2020), such as between sodium and chlorine atoms. Sodium atom (Na) achieves stability by releasing one valence electron to form an ion (Na^+) with a configuration like neon; the $_{11}\text{Na}$ (2. 8. 1) atom becomes ion $_{11}\text{Na}^+$ (2. 8). Likewise, the unstable chlorine (Cl) atom receives an additional electron from the Na^+ ion to form a Cl^- ion and achieve the configuration of argon, hence $_{17}\text{Cl}$ (2. 8. 7) atom becomes $_{17}\text{Cl}^-$ (2. 8. 8) ion. Electrostatically, Na^+ and Cl^- attract each in the ion lattice because they have opposite charges called ionic bonds.

Metallic bonding also relates to the tradition of attracting the Sasak tribe of Lombok. These bonds are formed because of the attraction between the positive charges possessed by metal ions and electrons' negative charges (Wahyudiati, 2021). The relevance of metal ties with the *nenarikh* and *sorong serah* traditions includes the handover of responsibilities based on the need to accept each other's strengths and weaknesses (Sutrisno et al., 2020). In this elopement custom, the

bride-to-be is not immediately returned to the groom's home, but instead is concealed with a close family member or friend, therefore this tradition is known as *te ta sebo'* or hidden.

The process of ionic bond formation through interactions between two or more atoms is accompanied by energy expenditure. The concept has a relevant meaning or is analogous to the tradition of *sorong serah* (handover from the woman to the man) and *aji krama*, known as *krama gubuk*. The *aji krama gubuk* is the handover of standard fees with a certain amount agreed through the *sorong serah aji krama* ceremony. The amount of customary payment is usually in the form of money or jewelry according to the request of the bride's family. Molecules and compounds are created when two or more elements contact chemically and form a cohesive chemical bonding unit (Achamad, 2001). The meaning contained in the *sorong serah* concept is relevant to implementing the Islamic education. The book *Ihya Ulum Ad-Din*, as one of the greatest works of Imam Al-Ghazali, explains that the method of forming morality (*akhlakul karimah*) can be performed through the application of two methods (Ainiyah, 2013; Fadli, 2017; Musrifah, 2016), namely; 1) *riyadah* or habituation, which is to get students to practice or implement good and noble character while interacting with their environment and when worshiping God Almighty; and 2) experience or *at-tajribah*, namely providing examples from teachers, making friends with people with good morals, and taking lessons through direct interaction with the community.

The *nyongkolan* has relevant meanings or is analogous to the concept of ionic bond formation. This is based on the principles of tolerance, cooperation, and mutual help because they complement each other and need to achieve stability or prosperity. Ionic bonds occur between positive and negative ions to form molecules or compounds between metallic and nonmetallic elements (Chang, 2004). This *nyongkolan* tradition emphasizes the principle of tolerance or mutual respect, cooperation, and help. It strengthens the relationship between the family of the woman and the groom (Budiwanti, 2000; Fadli, 2018). The meaning contained in the *nyongkolan* concept has relevance to implementing the Islamic education guided by moral education. The formation of noble character can be pursued through habituation and example obtained by students in social life (Djaelani, 2013). This is achieved through local cultural wisdom and spiritual values such as the principles of cooperation, kinship, cooperation, and tolerance. The concept of Islamic education places great importance on the development of moral and spiritual aspects. Therefore, good human beings are formed by implementing divine values or religiosity in every aspect of life.

The growth and development of moral and spiritual values are manifested in Chemistry, Physics, Biology, Citizenship Education, Social Studies, History, Islamic Religious Education, Arabic, Nahu, and Fiqh. This is relevant to implementing the educational concept proposed by Imam Al-Ghazali, which has characteristics through the development of student interests and talents. The implementation focuses on developing cognitive or knowledge values and prioritizes the development of moral, social, and spiritual aspects (Fadli, 2017; Musrifah, 2016; Subur, 2016; Rasmuin, 2019). Meanwhile, the context of the approaches and methods applied in Islamic education places more emphasis on acquiring concepts through the habituation and experience of students as well as educators acting as the person in charge and guiding all learning activities. Spiritually intelligent students can be identified through learning activities accompanied by constructing knowledge and developing morality, social values, mental and spiritual skills. Therefore, the learning objectives, which are the mandate of the 1945 Constitution, can be achieved maximally.

4. CONCLUSION

Customs as local wisdom of the Sasak Lombok tribe with relevance (analog) to the theory of ionic bond formation are the *merarik* (marriage) tradition which consists of *nenarikh*, *sorong serah aji krama* and *nyongkolan*. The chemical bond theory, which has relevance to the Islamic education concept, is analyzed based on electron configuration, handing over electron pairs to achieve a stable electron configuration (similar to a noble gas) through the formation of negative ions and positive ions, energy expenditure, as well as the formation of ionic bonds and metallic bonds. Ethnochemistry based on local Sasak knowledge should embrace this concept of collaboration, responsibility, mutual need, respect, reciprocal giving and receiving, deliberation, and consensus to achieve national educational goals. This concept is crucial for helping students see themselves as moral, social, intellectual, and spiritually intelligent human beings. Students' cognitive, emotional, and psychomotor results may be improved when an ethnochemical approach to learning is implemented.

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