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Ethnoscience Studies in Songket Sasak Cloth Motifs: Prospective Science Teacher Perceptions

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Abstract: The aims of this study were to explore the perceptions of prospective science teachers towards ethnoscience studies in the *songket* cloth motif of the sasak tribe. This exploratory research conducted in three education study programs namely Biology, Chemistry, and Physics Education with 53 prospective science teachers involved as research subject. Closed questionnaire with likert scale and expertly validated applied for data collection. The data were analyzed by quantitative descriptive statistics, Anova test and t-test inferential statistics. The results showed that (1) perception of prospective science teachers has an average score in the "Good" category in terms of gender, regional origin, and study program; (2) there were no significant differences in the perceptions in male and female prospective science teacher based on t-test significance value of 0,455 > 0,05; (3) there were no significant difference in prospective science teacher's perception refer to origin (native Lombok and non-native) based on t test significance value of 0,466 > 0,05; (4) there were no significant difference in the perception of prospective science teachers in the biology, chemistry, and physics education study program based on Anova's significance value of 0,423 > 0,05.

Keywords: Ethnoscience; Songket; Prospective science teacher.

Introduction

Education is a deliberate and structured activity (Purwanto, 2011) to empower the potential of each generation to be able to develop and build civilization in the future (Hadi et al., 2019; Hadi & Ahied, 2017). The development of civilization can be forced by strengthening the understanding of the nation's children towards the legacy of their predecessors in the surrounding environment such as culture and customs (Sarini & Selamet, 2019). (Hadi & Ahied, 2017) affirming that education is one of the effective structured efforts to introduce culture through learning activities. According to (Suastra, 2010) that education has a formal role to cultivate and acculturate the behavior of students in preserving culture. Education and socio-culture have a positive correspondence that must be realized in learning for generations of the nation (Trianto., 2014). Socio-cultural can generate certain contributions to the student's learning experience both on cognitive, appective, and psychomotor aspects (Irawan & Muhartati, 2019). (Hadi et al., 2019) states that socio-cultural diversity in Indonesia can be optimized to support student learning in schools.

Indonesia is one of the nations with a diversity of tribes, cultures, regional languages, customs, and arts (Sarini & Selamet, 2019). Daily social activities are accompanied by a thriving culture and heritage from its predecessor generations (Arlianovita et al., 2015). Lombok's most famous culture reaching abroad is typical traditional cloth weaving of *Sasak* tribe which in the local language called *nyensek*. Based on observations, it is known that *nyensek* created among the women of the *Sasak* tribe has produced weaving cloth called *songket*

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with typical *Sasak motifs*. The *songket* cloth motifs are varied and each has a strong philosophical meaning in life of *Sasak* tribal community (Sumadewa & Hasbullah, 2021). This is confirmed by the opinion of (Jayadi, 2017) that the *songket* cloth motif is a form of cultural expression of the *Sasak* tribal people inherited to each generation. The meaning of each *songket* cloth motif is to provide community understanding of the local wisdom symbols that have been cultivated in the *Sasak* tribe (Hasbullah et al., 2020).

The popular motifs of typical Songket sasak cloth is *wayang, subahnale, keker* or *merak, bintang empat,* and *lumbung/alang* (Nurmeisarah et al., 2015). (Misnawati, 2016) research results describe that (1) The *wayang* motif reconstruction is inspired by the couple of bride and groom, and *Tunjung* (*Mimusops elengi*) flower images, means that human beings must live together and respect each other; (2) the *subahnale* motif reconstruction is inspired by tanjung and kenanga (*Cananga odorata*) flower images, which means the *Almighty* based on the word *Subhanallah*; (3)) the *keker* and *merak* motif reconstruction is inspired by peacocks and tree branches, means eternal holy love; (4) the *bintang empat* motif reconstruction is inspired by four-star (Morning Star) and Ceplok (*Gardenia jasminoides*) flower crown images, means four cardinal directions in life; (5) the *alang* motif reconstruction is inspired by alang or lumbung house, *Tunjung* flower/petals, and kenanga flower crown images, means well-being and prosperity.

According to (Misnawati, 2016), *songket* cloth motifs inspired by biodiversity in people's lives such as animal *species*, types of flowers, and the structure of the flower, contains information of indigenous science that relevant to elaborate the natural sciences concepts. According to (Hadi et al., 2019) *indigenous* science based on community culture is important to directing exploration of science learning concept in the classroom. The concept of science can be explored through *indigenous science* in songket cloth motifs to strengthen concepts, attitudes, and skills (Kartono et al., 2010). This is in accordance with the opinion (Koes, 2003), the key key in science learning is to actively involve students to interact with concrete objects in everyday life such as *songket cloth motifs*. Learning science concepts requires the nearby environment and socio-culture concepts as a learning resource (Arlianovita et al., 2015).

Indigenous science elaboration of *songket* cloth motifs in science concepts learning is known as a form of ethnoscience learning (Asmaningrum et al., 2021). Entnoscience is an scientific exploration of indigenous science (*Sarini* & Selamet, 2019). This ethnoscience study has a focus on integrating the indigenous cultural values of the people into science learning (Parmin, 2017). The cultural values contained in the symbolic motifs of *songket* cloth contain *indigenous science* that has been known to the public in descending, however it has not been scientifically formalized in science learning (Asmaningrum et al., 2021). Therefore, ethnoscience learning is essential to preserve the large number of cultural values in Indonesia (Sudarmin, 2014). Ethnoscience learning has relevance to the main objectives of science education set by UNESCO to create a young generation who has science and cultural literacy (Sudarmin & Asyhar, 2012). Ethnoscience learning is important to build conservation attitudes and preventing destruction of cultural and traditions *distinctiveness* of *Sasak* tribe (Kasa, 2011).

Ethnoscience-based science learning can facilitate meaningfull learning (Akmal et al., 2021), by exploration activities and application of the concept of science in *indigenous science* or local wisdom of the nearby *community* (Puspasari et al., 2019; Toharudin & Setia, 2017). This is in accordance with the opinion (Khoiri & Sunarno, 2018), Ethnoscience is an interesting learning approach because of *indigenous* science reconstruction of nearby community into scientific knowledge so that more beneficial for students well-being (Mardianti et al., 2020; Suastra, 2010; Wahyu, 2017). Meaningful learning can facilitate students to learning by doing, connect the concepts of science studied with cultural values and traditions in daily life (Dewi et al., 2019; Khoiri & Sunarno, 2018; Puspasari et al., 2019).

The ethnoscience approach is effective for integrating cultural values *in* science subject (Purnamasari et al., 2021). Ethnoscience approaches are important for building cultural care attitudes and tolerance for local cultures and traditions diversity of a region and sustainable development based on local potency (Akmal et al., 2021; Khery et al., 2022; Parrish & Linder-vanberschot, 2010; Wahyu, 2017). This is reinforced by (Mardianti et al., 2020), ethnoscience approaches can fortify students from the acculturation of foreign cultures that is transformed massively by electronic media in today's digital age. The ethnoscience approach is effective for exploring procedural knowledge of cultural values and deeply oriented to integrated understanding than just a deep understanding (Chiappetta & Koballa, 2006; Listyawati, 2012; Wahyu, 2017). This is supported by (Emdin, 2011) study that the ethnoscience approach can improve students competency, due to increasing in motivation and enthusiasm (Damayanti et al., 2017). Departing from this, the use of *indigenous* science of *songket* cloth motifs in science learning has the potential to strengthen students science and cultural literacy (Arlianovita et al., 2015; Pertiwi & Firdausi, 2019). Therefore, deeply important for prospective science teachers to have ethnoscience insights that must be oriented in learning and everyday life in the midst of the rapid development of science and technology that construct modern science (Parmin, 2017; Sarini & Selamet, 2019; Sudarmin, 2014). For further development of science learning in higher

education, researchers consider the necessary of investigating prospective science teacher perceptions of entonsains-based science learning on typical *Songket sasak* motifs

Method

This study was carried out by exploratory descriptive research (Muliadi et al., 2021; Muliadi & Mirawati, 2020), to describe the perception of *prospective* science teachers about ethnoscience in the Sasak tribe *Songket*. Through an *ex post facto* approach, researchers examine cause-and-effect relationships without manipulation or treatment, but measure the data of an event that has occurred (Arikunto, 2016; Singarimbun & Efendi, 2006). The were 53 prospective science teachers of education study program of biology (33), physics (13), and chemistry (7) of Universitas Pendidikan Mandalika as respondents that obtained by *convenience sampling* techniques by considering the accessibility of students in filling out the questionnaire that has been shared in the *google form* (Fink, 2011).

Data collected using closed questionnaire instruments with a likert scale of 1 to 5 ranging from strongly disagree to strongly agree (Muliadi, 2020a) already *available* in online *google form* (Adha et al., 2020). The questionnaire is prepared in 20 points of statement with reference to indicators of prospective science teachers perceptions about ethnoscience studies developed (Rikizaputra et al., 2021). The questionnaire has been declared validaty by experts.

Data was analyzed by quantitative descriptive statistics to describe prospective science teacher perceptions of ethnoscience studies in term of sasak tribe songket motifs. Perception data is interpreted in the form of categories by the assessment criteria developed (Muliadi, 2020b) as presented on Table 1.

Table 1. Conversion criteria of prospective science teacher perception average scores

Rata-rata skor ($\bar{p}$)	Kategori
3.51 – 4.00	Excellent
2.51 – 3.50	Good
1.51 – 2.50	Fair
1.00 – 1.50	Less

The research data were further analyzed by inferential statistics i.e. (1) Anova test (*Analisis of Varians*) with 5% degree of significance to evaluate the comparison of prospective science teacher perceptions among study programs; (2) *independent sampel t-test* with 5% degree of significance to analyzed to evaluate the comparison of prospective science teacher perceptions *between gender* and regional origin. The formulation of the statistical hypothesis is H_0: $\mu 1 = \mu 2$ (no significant difference in prospective science teacher perception) dan H_1: $\mu 1 \neq \mu 2$ (significant difference in prospective science teacher perception). If the Anova test and *t-test p(Sig.)-value* smaller than 0,05, then H_0 is rejected and H_1 is accepted and vice versa.

Result and Discussion

Data description of prospective science teacher's perceptions toward ethnoscience studies in *songket sasak* cloth motif described on Table 2.

Tabel 2. Prospective science teacher's perceptions

Variables		N	Σ Score	$\bar{p}$	Category
Gender	Male	15	48.00	3.20	Good
	Female	38	124.65	3.28	Good
Origin	Lombok Native	41	132.76	3.24	Good
	Nonnative	12	39.88	3.32	Good
Study Program	Biology Education	33	108.76	3.30	Good
	Physic Education	13	42.12	3.24	Good
	Chemistry Education	7	21.76	3.11	Good

In table 2 it can be seen that (1) The perception of both male and female prospective science teacher have good category with average score of 3,20 and 3,28 respectively; (2) The perception of both Lombok native and nonnative prospective science teacher have good category with average score 3,24 and 3,32 respectively; (3) perceptions of prospective science teachers in three study programs, biology, physics, and chemistry education, have good category with average score of 3,30, 3,24 and 3,11 respectively. A comparison of each variation's average is shown in Figure 1.

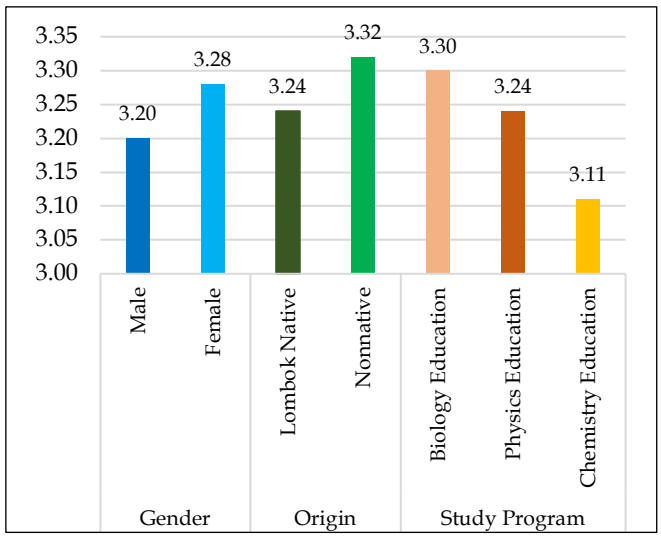

Figure 1. A comparison of each variation's average

Parametric statistical analysis of data of prospective science teacher's perceptions toward ethnoscience

studies in *songket sasak* cloth motif has met the prerequisite test of homogeneity and normality at the level of significance 5% (0,05) as presented in Table 3.

Table 3. Homogeneity and normality test results

N	Levenes Statistic test score	Sig.	Kolmogorov-Smirnov's test score	Sig.
56	0.944	0.396	0.494	0.968

Table 3 shows the significance value of the *Levenes Statistic test score* is 0.396 > 0.05 means data variant is homogeneous. The significance value of the *Kolmogorov-Smirnov's test score* is 0,968 > 0,05 means data distibution is normal.

The differences in the perceptions of prospective science teacher refers to gender and origin (Lombok native and nonnative) was analyzed by independent sampel t-test at the level of significance 5% (0,05) as presented in the Table 4.

Table 4. Independent sampel t-test refer to gender and origin

Group		t-test for Equality for Means			
		t	df	Sig.	Mean diff.
Prospective science teacher's perseptions	Gender	-0.752	51	0.455	-0.078
	Origin	-0.734	51	0.466	-0.082

On Table 5 can be seen t-value of Prospective science teacher's perseptions refer to gender (-0.752) and origin (-0,734) have significance value smaller than 0.05 of 0,455 and 0.466 respectively, so that H_1 is rejected and H_0 is accepted. It can be concluded that that there is no significant difference in prospective science teacher's perseptions toward ethnoscience studies in *songket sasak* cloth motif refers to both gender and origin.

The differences in the perceptions of prospective science teacher refers to study program was analyzed by Anova (*Analysis of Variance*) at the level of significance 5% (0,05) as presented in the Table 5.

Table 5. ANOVA test result

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	0.205	2	0.103	0.876	0.423
Within Groups	5.863	50	0.117		
Total	6.068	52			

The results of Anova test in table 4 present significance value of F (0,876) is 0,423 > 0,05 so that H_1 is rejected and H_0 is accepted. This means that there is no significant difference in prospective science teacher's perseptions refers to study program (biology, physics, and chemistry education) toward ethnoscience studies in *songket sasak* cloth motif.

Elaboration of the research results explains that prospective science teacher of biology, chemistry, and physics education have a good perception of ethnoscience studies in *songket sasak* cloth motifs. These results show that prospective science teachers have knowledge and *indigenous science* information in *songket* cloth motifs. They believe that its application in learning science concepts is an interesting learning innovation. This is in accordance with (Lee & Kim, 2018) opinion that a person's attitude and knowledge towards the learning of science is bridged by his perception of science. Good perceptions confirm positive response to ethnoscience in *songket cloth motifs* and their application to science learning. According to (Astalini et al., 2019), the response described whether students rejected or accepted the concept of learning. They could have gained knowledge from various information. A good perception of ethnoscience learning is an important aspect to explains prospective science teachers fairly interest in ethnoscience learning (Dewi et al., 2019; Fulmer et al., 2019; Hacieminoglu, 2016; Julianto et al., 2018; McDonald et al., 2021).

The results of this study explained that there were no significant differences in student perceptions based on study program, gender, and regional origin. This explains that all prospective science teacher have an equally good perception and at the same time show their self-efficacy strength on the importance of ethnoscience-based learning. They gave above average respons to inclusion idea of indigenous science of songket cloth motifs on science learning. This is in accordance with the results of (Misnawati, 2016) study that *songket* cloth motifs inspired by biodiversity in people's lives such as animal species, flower types, and flower structures, contain *relevant indigenous* science information to be elaborated in the concept of science learning. According to (Hadi et al., 2019), *indigenous science* contained in community culture is important to explore in the concept of science learning. The concept of science learning can be explored from *indigenous science* in songket cloth motifs to strengthen concepts, attitudes, and skills (Kartono et al., 2010). This is confirmed by the opinion of (Koes, 2003) that the key in science learning is must be able to facilitate students to actively interact with concrete objects in everyday life such as *songket cloth motifs*. Learning science concepts requires the concept of the nearby environment and socio-culture as a learning resource (Arlianovita et al., 2015; Dewi et al., 2019; Khery et al., 2022).

Respondents of this study explained their belief that ethnoscience-based learning through *songket cloth motifs* could strengthen science and cultural literacy, and

can shape the character of cultural concerns. According to (Dewi et al., 2019), ethnoscience-based learning has improved student's science literacy effectively. According to (Kartono et al., 2010), the concept of science learning can be explored from *indigenous science* in songket cloth motifs to strengthen concepts, attitudes, and skills. They also believe that ethnoscience-based learning could be enjoyable. This is in line with opinion that ethnoscience-based science learning could facilitate meaningfull learning through exploration and applications of science concepts in indigenous science or local wisdom of the nearby community (Akmal et al., 2021; Puspasari et al., 2019; Toharudin & Setia, 2017). (Koes, 2003; Suryati et al., 2017) argues that the key in fun science learning is to actively engage learners to interact with concrete objects in everyday life such as *songket cloth motifs*. Learning science concepts requires the concept of the nearby environment and socio-culture such as *songket cloth motifs* as a learning resource (Arlianovita et al., 2015). Ethnoscience learning is essential to create a young generation with culture and science literacy (Dewi et al., 2019; Khery et al., 2021; Sudarmin et al., 2019), and building a conservation attitude (Kasa, 2011; Sudarmin & Sumarni, 2018).

Respondents explained that ethnoscience-based learning is important to develop as an effort to typical *songket* cloth of Sasak tribe conservation. This corresponds to the opinion of (Sudarmin, 2014) that ethnoscience learning is essential for cultural values conservation. According to (Purnamasari et al., 2021), ethnoscience learning is effective for integrating cultural values in science learning. Ethnoscience-based learning is important to build an attitude of cultural concern, local wisdom, and an attitude of tolerance for the cultural diversity of each region, and the development of regional potential (Akmal et al., 2021; Khery et al., 2021; Parrish & Linder-vanberschot, 2010; Wahyu, 2017). (Mardianti et al., 2020) explained that ethnoscience approaches can fortify students from the acculturation of foreign cultures that is transformed massively by electronic media in today's digital age. The ethnoscience approach is effective for exploring procedural knowledge of cultural values (Chiappetta & Koballa, 2006; Listyawati, 2012; Wahyu, 2017). The application of *indigenous* science of *songket* cloth motifs in science learning has the potential to strengthen students science literacy and cultural concern (Arlianovita et al., 2015; Pertiwi & Firdausi, 2019).

Conclusion

Based on the results of the study, it can be concluded that that (1) perception of prospective science teachers has an average score in the "Good" category in terms of gender, regional origin, and study program; (2) there were no significant differences in the perceptions in male and female prospective science teacher based on t-test significance value of 0,455 > 0,05; (3) there were no significant difference in prospective science teacher's perception refer to origin (native Lombok and non-native) based on t test significance value of 0,466 > 0,05; (4) there were no significant difference in the perception of prospective science teachers in the biology, chemistry, and physics education study program based on Anova's significance value of 0,423 > 0,05.

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References

Adha, M. A., Arifin, I., Maisyaroh, Sultoni, & Suharni. (2020). Perbedaan minat berwirausaha berdasarkan jenis kelamin mahasiswa. *JAMP: Jurnal Adminitrasi Dan Manajemen Pendidikan*, *3*(3), 208–215. https://doi.org/http://dx.doi.org/10.17977/um027v3i32020p208

Akmal, A. U., Lia, Lestari, T., Asra, A., Effendy, Festiyed, & Skunda. (2021). Analisis Etnosains dalam Pembelajaran IPA di Sekolah Dasar Kota Padang dan Bukittinggi. *Jurnal Inovasi Pendidikan Dan Pembelajaran Sekolah Dasar*, *4*(2), 68–77. https://doi.org/https://doi.org/10.24036/jippsd.v4i2.111385

Arikunto, S. (2016). *Arikunto. 2016. Prosedur Penelitian (Suatu Pendekatan Praktik). Jakarta: Rineka Cipta.* Rieneka Cipta.

Arlianovita, D., Setiawan, B., & Sudibyo, E. (2015). Pendekatan etnosains dalam proses pembuatan tempe terhadap kemampuan literasi sains. *Seminar Nasional Fisika Dan Pembelajarannya*, 101–107.

Asmaningrum, H. P., Betaubun, M., & Witdarko, Y. (2021). Persepsi Mahasiswa dalam Pembelajaran Kimia dengan Pendekatan Etnosains terhadap Kemampuan Literasi Sains Student Perception in Chemistry Learning with Ethnoscience Approach to Science Literacy Ability. *Prosiding Seminar Nasional Kimia (SNK) 2021*, 322–328. Retrieved from https://kimia.fmipa.unesa.ac.id/wp-content/uploads/2021/12/322-328.pdf

Astalini, A., Kurniawan, D. A., Kurniawan, N., & Anggraini, L. (2019). Evaluation of Student ' s Attitude Toward Science in Indonesia. *Open Journal for Educational Research*, *3*(1), 1–12.

https://doi.org/https://doi.org/10.32591/coas.oj er.0301.01001a

Chiappetta, E. L., & Koballa, T. R. (2006). *Science Instruction in the Middle and Secondary Schools: Developing Fundamental Knowledge and Skills for Teaching*. The CV Mosby Company.

Damayanti, C., Rusilowati, A., & Linuwih, S. (2017). Pengembangan Model Pembelajaran IPA Terintegrasi Etnosains untuk Meningkatkan Hasil Belajar dan Kemampuan Berpikir Kreatif. *Journal of Innovative Science Education*, *6*(1), 117–128. https://doi.org/https://doi.org/10.15294/jise.v6i 1.17071

Dewi, C. A., Khery, Y., & Erna, M. (2019). An ethnoscience study in chemistry learning to develop scientific literacy. *Jurnal Pendidikan IPA Indonesia*, *8*(2), 279–287. https://doi.org/10.15294/jpii.v8i2.19261

Emdin, C. (2011). Droppin' Science and Dropping Science : African American Males and Urban Science Education. *JAAME: Journal of African American Males in Education*, *2*(1), 1–15. Retrieved from https://jaamejournal.scholasticahq.com/article/1 8413.pdf

Fink, A. (2011). *How to sample in surveys. In how to sample in surveys.* SAGE Publication. https://us.sagepub.com/en-us/nam/how-to-sample-in-surveys/book225416

Fulmer, G. W., Ma, H., & Liang, L. L. (2019). Middle school student attitudes toward science , and their relationships with instructional practices : a survey of Chinese students ' preferred versus actual instruction. *Asia-Pacific Science Education*, *5*(9). https://doi.org/https://doi.org/10.1186/s41029-0190037-8

Hacieminoglu, E. (2016). Elementary School Students ' Attitude toward Science and Related Variables. *International Journal of Environmental and Science Education*, *11*(2), 35–52. https://doi.org/10.12973/ijese.2016.288a

Hadi, W. P., & Ahied, M. (2017). Kajian Etnosains Madura dalam Proses Produksi Garam sebagai Media Pembelajaran IPA Terpadu. *Jurnal Ilmiah Rekayasa*, *10*(2), 79–86. https://doi.org/https://doi.org/10.21107/rys.v10 i2.3608

Hadi, W. P., Muharrami, L. K., Hidayati, Y., Rosidi, I., & Maryamah, S. (2019). Development of Magazine on Madura Salt Theme With Ethnoscience Approach to Improve Student's Character. *Unnes Science Education Journal*, *8*(2), 118–129. https://doi.org/https://doi.org/10.15294/usej.v8 i2.31524

Hasbullah, Santosa, H., & Swandi, I. W. (2020). Makna Desain Karakter "Si Meton" Pada Maskot Pilkada NTB Tahun 2018. *ANDHARUPA: Jurnal Desain Komunikasi Visual & Multimedia*, *06*(02), 173–186. https://doi.org/https://doi.org/10.33633/andhar upa.v6i02.3440

Irawan, B., & Muhartati, E. (2019). Identifikasi Nilai Etnosains pada Kearifan Lokal Berkarang dan Menyondong Ikan Pada Masyarakat Pesisir Bintan. *J. Pedagogi Hayati*, *3*(1), 1–6. https://doi.org/https://doi.org/10.31629/ph.v3i 1.1595

Jayadi, S. (2017). Rasionalisasi Tindakan Sosial Masyarakat Suku Sasak Terhadap Tradisi Perang Topat (Studi Kasus Masyarakat Islam Sasak Lombok Barat). *Sosiologi Agama: Jurnal Ilmiah Sosiologi Agama Dan Perubahan Sosial*, *11*(1), 13–34. https://core.ac.uk/download/pdf/233637194.pdf

Julianto, Wasis, & Agustini, R. (2018). Profil Sikap Terhadap Sains, Keterampilan Proses Sains, dan Kreativitas Mahasiswa Jurusan PGSD FIP UNESA di Mata Kuliah Konsep Dasar IPA. *Prosiding Seminar Nasional Pendidikan*, 197–202. Retrieved from http://snpfmotogpe.ulm.ac.id/wp-content/uploads/2018/05/25-Julianto-Wasis-Rudiana-Agustini.pdf

Kartono, Hairida, & Bujang, G. (2010). Penelusuran Budaya Teknologi Lokal dalam Rangka Rekonstruksi dan Pengembangan Sains di Sekolah Dasar (Kajian Etnosains dan Etnoteknologi terhadap Masyarakat Tradisonal Lingkungan Pertanian Suku Melayu dan Dayak di Kabupaten Pontianak). *Jurnal Cakrawala Kependidikan*, 9(1). 19–26). Retrieved fro https://jurnal.untan.ac.id/index.php/jckrw/articl e/view/269

Kasa, I. W. (2011). Local Wisdom In Relation To Climate Change. *Journal of International Society for Southeast Asian Agricultural Sciences (J.ISSAAS)*, *17*(1), 22–27.

Khery, Y., Indah, D. R., Candra, N., Setiawan, E., Nida, S., Aini, M., Djarwo, C. F., & Nufida, B. A. (2021). *Potency of science learning oriented to local wisdom and tourism in enhancing students learning performance*. *020044*(March). https://doi.org/https://doi.org/10.1063/5.00431 25

Khery, Y., Sarjan, M., Nufida, B. A., & Efendi, I. (2022). Etnosains Tumbuhan Nyamplung (Chalophyllum inophillum L.) dalam Tradisi Masyarakat Sasak. *Biocaster : Jurnal Kajian Biologi*, *2*(4), 176–188. Retrieved from https://e-journal.lp3kamandanu.com/index.php/biocaster/ article/view/120/163

Khoiri, A., & Sunarno, W. (2018). Pendekatan Etnosains Dalam Tinjauan Fisafat (Implementasi Model Pembelajaran STEM: Science, Technology, Enginering, and Mathematic). *SPEKTRA: Jurnal Kajian Pendidikan Sains*, *4*(02), 145–153.

https://doi.org/http://dx.doi.org/10.32699/spektra.v4i2.55

Koes, S. H. (2003). *Strategi pembelajaran Fisika*. Universitas Negeri Malang.

Lee, S., & Kim, S. H. (2018). Scientific Knowledge and Attitudes Toward Science in South Korea: Does Knowledge Lead to Favorable Attitudes? *Science Communication*, *40*(2), 147–172. https://doi.org/https://doi.org/10.1177/1075547017753189

Listyawati, M. (2012). Pengembangan Perangkat Pembelajaran IPA Terpadu di SMP. *Journal of Innovative Science Education*, *1*(1), 61–69. Retrieved from https://journal.unnes.ac.id/sju/index.php/jise/article/view/46

Mardianti, I., Kasmantoni, & Walid, A. (2020). Pengembangan Modul Pembelajaran IPA Berbasis Etnosains Materi. *BIO-EDU : Jurnal Pendidikan Biologi*, *5*(2), 97–106. https://doi.org/https://doi.org/10.32938/jbe.v5i2.545

McDonald, C. V., Klieve, H., & Kanasa, H. (2021). Exploring Australian Preservice Primary Teachers' Attitudes Toward Teaching Science Using the Dimensions of Attitude toward Science (DAS). *Research in Science Education.*, *51*, 1325–1348. https://doi.org/https://doi.org/10.1007/s11165-019-09910-z

Misnawati, Y. (2016). *Makna Simbolik Kain Songket Sukarara Lombok Tengah Nusa Tenggara Barat (NTB)* (Issue November) [Universitas Negeri Yogyakarta]. Retrieved from http://eprints.uny.ac.id/43970/1/TAS YULINDA MISNAWATI.PDF

Muliadi, A. (2020a). Perbedaan Gender Dalam Sikap Entrepreneur Mahasiswa Pendidikan Biologi. *Jurnal Ilmiah Mandala Education*, *6*(2), 329–334. https://doi.org/http://dx.doi.org/10.36312/jime.v6i2.1439

Muliadi, A. (2020b). Sikap Entrepreneur Mahasiswa Pendidikan Biologi. *Jurnal Ilmu Sosial Dan Pendidikan*, *4*(3), 286–291. https://doi.org/http://dx.doi.org/10.36312/jisip.v4i3.1208

Muliadi, A., & Mirawati, B. (2020). The Effect of Personal Attitude and Subjective Norm on Entrepreneurial Interest of Biology Education Students. *E-Saintika: Jurnal Penelitian Dan Pengkajian Ilmu Pendidikan*, *4*(3), 342–351. https://doi.org/https://doi.org/10.36312/e-saintika.v4i3.307

Muliadi, A., Mirawati, B., & Prayogi, S. (2021). The Effect Entrepreneurship Education and Subjective Norm on Biology Students ' Self -Efficacy in Entrepreneurial. *Prisma Sains: Jurnal Pengkajian Ilmu Dan Pembelajaran Matematika Dan IPA IKIP Mataram*, *9*(1), 127–135. https://doi.org/https://doi.org/10.33394/jps.v9i1.3981

Nurmeisarah, T., Sudirtha, I. G., & Angendari, M. D. (2015). Tinjauan Tentang Tenun Tradisional Dusun Sade Desa Rambitan Kecamatan Pujut Kabupaten Lombok Tengah. *Jurnal Bosaparis*, *3*(1). https://doi.org/https://doi.org/10.23887/jjpkk.v3i1.4854

Parmin. (2017). *Ethnosains*. Swadaya Manunggal.

Parrish, P., & Linder-vanberschot, J. A. (2010). Cultural dimensions of learning: Addressing the challenges of multicultural instruction. *International Review of Research in Open and Distance Learning*, *11*(2). https://files.eric.ed.gov/fulltext/EJ895744.pdf

Pertiwi, U. D., & Firdausi, U. Y. R. (2019). Upaya Meningkatkan Literasi Sains Melalui Pembelajaran Berbasis Etnosains. *Indonesian Journal of Natural Science Education (IJNSE)*, *02*(01), 120–124. https://doi.org/10.31002/nse.v2i1.476

Purnamasari, S., Marpuah, S., & Sunaryo, I. (2021). Pembelajaran Ilmu Pengetahuan Alam Berbasis Etnosains untuk Mengembangkan Kemampuan Berpikir Kritis Siswa Sekolah Dasar. *EduBase : Journal of Basic Education*, *2*(1), 9–18. https://doi.org/https://doi.org/10.47453/edubase.v2i1.284

Purwanto. (2011). *Evaluasi Hasil Belajar*. Pustaka Pelajar.

Puspasari, A., Susilowati, I., Kurniawati, L., Utami, R. R., Gunawan, I., & Sayekti, I. C. (2019). Implementasi Etnosains dalam Pembelajaran IPA di SD Muhammadiyah Alam Surya Mentari Surakarta. *Science Education Journal (SEJ)*, *3*(1), 25–31. https://doi.org/10.21070/sej.v3i1.2426

Rikizaputra, Festiyed, Diliarosta, S., & Firda, A. (2021). Pengetahuan Etnosains Guru Biologi di SMA Negeri Kota Pekanbaru. *Journal of Natural Science and Integration*, *4*(2), 186–194. https://doi.org/http://dx.doi.org/10.24014/jnsi.v4i2.14257

Sarini, P., & Selamet, K. (2019). Pengembangan Bahan Ajar Etnosains Bali bagi Calon Guru IPA. *Wahana Matematika Dan Sains : Jurnal Matematika , Sains , Dan Pembelajarannya*, *13*(1), 27–39. https://doi.org/https://doi.org/10.23887/wms.v13i1.17146

Singarimbun, M., & Efendi, S. (2006). *Metode Penelitian Survai (Edisi Revisi)*. Pustaka LP3ES Indonesia.

Suastra, I. W. (2010). Model Pembelajaran Sains Berbasis Budaya Lokal untuk Mengembangkan Kompetensi Dasar Sains dan Nilai Kearifan Lokal di SMP. *Jurnal Pendidikan Dan Pengajaran*, *43*(2), 8–16. https://doi.org/https://doi.org/10.23887/jppundiksha.v43i1.1697

Sudarmin. (2014). *Pendidikan karakter, etnosains dan*

kearifan lokal (edisi pertama). Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Negeri Semarang.

Sudarmin, & Asyhar, R. (2012). Transformasi Pengetahuan Sains Tradisional menjadi Sains Ilmiah dalam Proses Produksi Jamu Tradisional. *Edu-Sains: Jurnal Pendidikan Matematika Dan Ilmu Pengetahuan Alam*, *1*(1), 1–7. https://doi.org/https://doi.org/10.22437/jmpmipa.v1i1.788

Sudarmin, & Sumarni, W. (2018). Increasing character value and conservation behavior through integrated ethnoscience chemistry in chemistry learning: A Case Study in the Department of Science Universitas Negeri Semarang. *IOP Conference Series: Materials Science and Engineering*, *349*(1). https://doi.org/10.1088/1757-899X/349/1/012061

Sudarmin, Sumarni, W., P, R. S. E., & S, S. S. (2019). Implementing the Model of Project-Based Learning: Integrated with ETHNO-STEM to Develop Students' Entrepreneurial Characters. *IOP Conf. Series: Journal of Physics: ICOMSET 2018*, 1–8. https://doi.org/10.1088/1742-6596/1317/1/012145

Sumadewa, I. N. Y., & Hasbullah. (2021). sformasi Pada Corak Kain Songket Sasak Lombok Sebagai Tipografi Identitas. *Jurnal Ekspresi Seni Jurnal Ilmu Pengetahuan Dan Karya Seni*, *23*(2), 394–406. https://doi.org/10.26887/ekspresi.v23i2.1751

Suryati, S., Khery, Y., & Dewi, C. A. (2017). *Development Strategy of Inquiry Based Mobile Learning on General Chemistry Classroom*. *Aes*, 439–443.

Toharudin, U., & Setia, I. (2017). Sundanese Cultural Values of Local Wisdom : Integrated to Develop a Model of Learning Biology. *International Journal of Sciences: Basic and Applied Research (IJSBAR)*, *32*(1), 29–49.

Trianto. (2014). *Mendesain Model Pembelajaran Inovatif, Progresif, dan Kontekstual*. Prenadomedia Group

Wahyu, Y. (2017). Pembelajaran Berbasis Etnosains Di Sekolah Dasar. *Jurnal Inovasi Pendidikan Dasar*, *1*(2), 140–147. Retrieved from https://unikastpaulus.ac.id/jurnal/index.php/jipd/article/view/264/187