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Research Article

The influence of science learning based on the local wisdom context on the cultural heritage conservation character

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Abstract: Local wisdom has uniqueness and values that have been preserved until now so that it has become a cultural heritage and a tourist attraction, one of which is bull-racing. However, the lack of national character of bachelor which is marked by Gen-Z's lack of self-awareness of the importance of local wisdom values is a problem of preserving and developing cultural and tourism heritage. Need to integrate local wisdom as a context with science through learning. This research aims to analyze the influence of science learning based on the local wisdom context on the cultural heritage conservation character. The research design used a true-experiment with non-equivalent control group design with 64 science bachelor candidates. Data collected using the observation of the cultural heritage conservation character and then analyzed using the Paired Sample Test, Effect Size, N-gain, and Independent Sample Test. The results of the paired sample test obtained a significance value of 0.00; effect size value of 0.94; N-gain value 0.90; the results of the independent sample test have a significance value of 0.00 indicating that science learning based on the local wisdom context has proven to have an effective influence on improving the cultural heritage conservation character for bachelor science candidates. This research implies that the use of the context of local wisdom in science learning can enhance the cultural heritage conservation character as an alternative way of preserving and developing cultural and tourism heritage in the era of Sustainable Development.

Keywords: Cultural heritage conservation character; local wisdom context; science learning

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1. Introduction

Currently the world is in the era of the Sustainable Development Goals/SDGs. The SDGs era focuses on Educational Sustainable Development (ESD). In the ESD era of the SDGs, the science undergraduate profession must have various competencies. There are competencies needed, including leadership, thinking skills (Schwab, 2017; Zubaidah, 2017; Norren & Beehner, 2021; Zhao et al., 2022), communication (Kleckner and Butz, 2022; Aririguzoh, 2022; Skagen et al., 2018), collaboration (Heeg et al., 2020; Kumar et al., 2022; Reid et al., 2022), and character in soft skill (Heeg et al., 2020; Kumar et al., 2022; Reid et al., 2022).

One of the characters in soft skills that is really needed in the SDGs era is the cultural heritage conservation character (Aririguzoh, 2022; UNESCO, 2017; UNESCO, 2015). Cultural heritage conservation character (CHCC) are the character of individuals achieving goals and maintain the physical and cultural characteristics of the object to ensure that its value is not diminished and that it will outlive our limited time span. The development of CHCC is very important in higher education. Students must have CHCC which must be improved to become graduates who are superior, dignified, and have noble character according to local wisdom.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) has emphasized that all educational institutions must cultivate the cultural heritage conservation character of students (Norren & Beehner, 2021; Burduk et al., 2021; Wiktor-Mach, 2019). Building and cultivating the cultural heritage conservation character of students must be the main objective of teaching science education in this SDGs era (Achille & Fiorillo, 2022). The cultural heritage conservation character also emphasizes the attitude of respecting, protecting and internalizing cultural heritage values to become a wise and tolerant individual, and make the right decisions for the continuation of life (Holtorf, 2018; Hoşkara et al., 2023). Remarkably, the significant contribution of the cultural heritage conservation character to encourage economic growth in developing countries in supporting the Gross Domestic Product (GDP), such as Indonesia is of great concern (Giliberto & Labadi, 2021; Otero, 2021). This statement implies that the cultural heritage conservation character is an important competency to be possessed by students, including science bachelor candidates.

Science bachelor candidates study natural phenomena that occur systematically. The results of the study of natural events consist of products, processes, attitudes, and applications as the essence of natural science (Haryadi & Pujiastuti, 2019; Card, 2014; Frigerio et al., 2021). The study of natural events is closely related to the local wisdom of an area (Hasbiah, 2015; Hidayati, 2019). In local wisdom there is knowledge, belief, understanding, or insight as well as customs or ethics that guide people's behavior in a certain place in an area (Naping et al., 2019).

Madura is an island that looks like a cow's body, consisting of four districts, namely: Bangkalan, Sampang, Pamekasan and Sumenep. Madura Island is inhabited by the Madurese who are thick with local wisdom, both social culture, language, food, and customs (Hidayati et al., 2019). There are uniqueness and values of Madurese local wisdom that have been preserved and conserved until now so that they have become a cultural heritage and a tourist attraction (Yasir, 2023).

The type of Madurese local wisdom which is a cultural heritage and tourist attraction is bull races. Madura keris have aesthetic shapes, patterns, pancor, sheath, wilah, and prestige (Rakhmawati et al., 2022). In making Madura keris, there are concepts of natural science material, work and energy, simple machines to facilitate work, material science elements/compound materials, and body regulatory systems. The Madurese keris as Madurese local wisdom is full of social, historical, philosophical, mystical meanings, the religiosity of the Madurese people so that it is preserved and developed as a cultural and tourist heritage (Iswahyudi, 2021; Rakhmawati et al., 2022; Yasir, 2023).

In general, the preservation and development of cultural heritage and tourism of local wisdom of Madura is carried out collectively by local institutions/governments. However, a number of problems impede the preservation and development of cultural heritage and tourism of local Madurese wisdom. The results of previous research showed a lack of national character of students (Wulandari, Yasir, dan Qomaria, 2020), which was characterized by a lack of self-awareness (awareness) of Madurese millennial generations (Gen-Z) of the importance of Madurese local wisdom values (Subagyo, 2020; Nahak, 2019). The cause of these problems is that the research conducted does not yet characterize citizen science as a contributor to research data (Malekzad et al., 2022; Kreibich et al., 2020; Yasir et al., 2020), and requires integrative media of Madurese local wisdom to sharpen illustrations of local wisdom in Science Learning (Yasir & Wulandari, 2020).

As a form of preservation and development of the cultural heritage and local wisdom tourism of Madura, it is necessary to integrate local wisdom as a context with science through learning. Innovation as a state of art in this research is to internalize the values of local Madurese wisdom as objects of cultural heritage (Madura keris) to the community through innovative science learning. Innovative science learning integrates

local local wisdom, such as Madura as well as learning models and approaches into teaching materials and media. The integration of local wisdom as a natural science learning context to study characterizes the scientific approach (Djaen *et al.*, 2021; Rochman et al., 2017; Suciati, 2023).

Integration of local wisdom in Science Learning in the form of learning innovations. The innovation used is science learning based on the context of local wisdom. Science learning based on local wisdom context is designed to increase the cultural heritage conservation character of science bachelor candidates at the University of Trunojoyo Madura. Science learning based on local wisdom context emphasizes problem-solving activities through enculturation, local wisdom-based problem-solving activities, reconstruction of findings through assimilation of local wisdom, communicating the results of solving problems scientifically, and evaluating processes and results through acculturation of local wisdom that is studied theoretically and empirically based on the learning theory of behaviorism, social, cognitivism, constructivism which involves pedagogy and andragogy, integrates people's cultural knowledge in science (Yasir et al., 2022; Pompimon et al., 2014; Mungmachon, 2013).

The expected instructional impact is in the form of strengthening the brain in thinking, especially thinking skills, communication, and collaborative integration of indigenous knowledge into scientific knowledge scientifically. The expected accompanying impact is a learning experience for students, especially as a science graduate candidate to study, integrate, and preserve local local culture. The process of integrating local wisdom into science learning encourages students to actively learn independently; local wisdom values and manners can also be preserved (Ilhami et al., 2019; Rochman, 2015). The integration of natural science material content obtained from Madurese local wisdom and archipelago national character education also involves science bachelor candidates as citizen science so as to strengthen the competency of the character of Madura cultural heritage conservation (Fuadi *et al.*, 2020; Wilujeng et al., 2019).

Based on the background described above, a study will be conducted with the title "The Influence of Natural Science Context-Based Learning on Local Wisdom on the Character of Preservation of Cultural Heritage". This study aims to analyze the influence of science learning based on the context of local wisdom on the character of cultural heritage preservation.

2. Materials and Methods

2.1 Types of research

This research was conducted at Trunojoyo University of Madura in March - May 2022. The scope of this research is the fourth-year students who took Ethnoscience course in academic year 2022/2023. This research is True Experiment with Randomized Subject Control-group Pre-test and Post-test Design (Arikunto, 2010). This research is emphasized on the analysis of the Science Learning based on the Local Wisdom Context (SLLWC), and Conventional Learning Model (CLM) effectiveness by analyzing the increase of cultural heritage conservation character of science bachelor candidates' before and after following the process of ethnoscience teaching with SLLWC. The Conventional Model in this research was lecturer-centered teaching model, which includes lecture, presentation, and discussion. The teaching instruments and research instruments are said to be valid if $r_{\circledcirc\circledcirc\circledcirc} >$ r table and invalid if $r_{\circledcirc\circledcirc\circledcirc} \leq$ r table. Ethnoscience teaching process with SLLWC Model and Conventional Model are said to be effective if: (1) there is a significant increase of cultural heritage conservation character of science bachelor candidates' at α = 5%, (2) the minimum N-gain is categorized as moderate, and (3) students' responses are at least positive.

2.2 Research Subjects and Objects

The research subjects was conducted to 77 students of Natural Science Education Study Program, Trunojoyo University of Madura, Indonesia, which came from a population of 96 students in two groups (experimental group-1 / SLLWC Model and control group / Conventional Model). The calculation of the sample number was based on the Slovin formula, that was the sample = [population / (1 + e^2 × population)] with error tolerance e = 5% (Tejada, & Punzalan, 2012; Sugiyono, 2017). This research took two groups, namely: group of: experiment group-1 came to 38 students; and control group came to 39 students, each of them was statistically in the same level of cultural heritage conservation character. Students are chosen because they will learn indigenous and scientific knowledge from the ethnoscience class. Meanwhile, the research object is the problem topic to be researched which is related to the research subject, namely in the form of characteristics related to the research subject. This research has research objects, including: Syntax and methods as well as SLLWC techniques and cultural heritage conservation character. PjBL syntax and methods and techniques: (1) problem identification activities through enculturation of local wisdom; (2) problem solving activities based on local wisdom; (3) reconstructing of findings through assimilation of local wisdom; (4) communicating the results of solving problems scientifically; and (5) evaluating of the process through acculturation of local wisdom, which is studied theoretically and empirically. Cultural heritage conservation character is student competencies. This means that what is observed is attitudes.

2.3 Data Types and Sources

The types of data used in this research are primary data and secondary data. Primary data consists of: the results of observations to students among ethnoscience learning as data sources, secondary data obtained from documentation studies of learning activity.

2.4 Data collection technique

The instruments in this research include observation and documentation studies. Observations are carried out systematically using observation guidelines and non-systematic without using instruments. Non-systematic observation to observe cultural heritage conservation character student and learning activities in implementing SLLWC. The observation guide is used as a record of things that occur during the activity process, then the results of the observation are interpreted.

Cultural heritage conservation character (CHCC) in science learning based on the local wisdom context is applied in the post-test to measure the increase in students' CHCC after the intervention. Student CHCC was identified by assessing the cultural heritage conservation character observation instrument sheet during the intervention. The instrument was developed by the authors and validated before being used for data collection. The instrument has never been used in previous research. Validation includes content, construct, and face validity involving science lecturers, cultural science lecturers, and school science teachers. They provide feedback on content, its relevance to high school students' cognitive levels, and language. Their feedback was taken into account to refine the final instrument for data collection. The intervention (SLLWC and CLM) was carried out for three meetings with 100 minutes each. The post-test was carried out three days after the last intervention meeting for 90 minutes.

The cultural heritage conservation character (CHCC) of students in science learning based on the local wisdom context in both groups was measured using the cultural heritage conservation character observation instrument in the post-test. CHCC was observed during an intervention involving seven equally well-trained observers. The parameters for classifying them are presented in Table 1 (Hoskara et al., 2023). Based on the literature study, CHCC are the character of individuals achieving goals and maintain

the physical and cultural characteristics of the object to ensure that its value is not diminished and that it will outlive our limited time span. The indicators of CHCC in this research are adapted from UNESCO (2016), Hoskara et al. (2023), and Nakonieczna & Szczepański (2023). The cultural heritage conservation character observation instrument sheet with five Likert scales contains three indicators: (a) identification of the cultural heritage values, (b) protecting cultural heritage objects, (c) building the nation's cultural resilience.

2.5 Data Analysis Techniques Data Analysis Techniques

The data that has been collected is then analyzed. Data analysis was carried out descriptively. The steps taken to analyze and interpret experiment research data are, 1) preparing and organizing the data; 2) explore and code the database; 3) describe findings and form themes; 4) represent and report findings; 5) interpret the meaning of the findings; and 6) evaluate the accuracy of the findings.

The difference in CHCC levels between the two groups was measured using the paired sample t-test after fulfilling the normality and homogeneity tests as prerequisite procedures. The influence of science learning based on the local wisdom context on the character of cultural heritage conservation of science bachelor candidates in terms of: 1) there is a significant increase in CHCC of science bachelor candidates calculated using the N-Gain statistically at α = 5% ; 2) the size of the science learning effect calculated using the effect size is a moderate effect; 3) the minimum average N-Gain CHCC science bachelor candidates is in the moderate category; 4) there is a difference in the CHCC of science bachelor candidates between science learning based on local wisdom context and conventional science learning which is calculated using a paired sample t-test which is statistically significant at α = 5%.

Table 1. Science bachelor candidates' CHCC parameter.

Score Interval	Category
$X < Mi - 1.5\ SDi$	Very Low
$Mi - 1.5\ SDi < X \leq Mi - 0.5\ SDi$	Low
$Mi - 0.5\ SDi < X \leq Mi + 0.5\ SDi$	Medium
$Mi + 0.5\ SDi < X \leq Mi + 1.5\ SDi$	High
$Mi + 1.5\ SDi < X$	Very High

Note: $Mi = (X_{max} + X_{min})\frac{1}{}$; $SDi = (X_{max} - X_{min})\frac{1}{}$

Source: Elaborated by the authors using data from Hoskara et al (2023).

3. Results

The results of the normality test and homogeneity test of variance show that the pretest, posttest, N-Gain CHCC scores are homogeneous and normally distributed for science learning based on the context of local wisdom and conventional learning models. Thus the impact of implementing science learning based on local wisdom contexts and conventional learning models in increasing the CHCC of science bachelor candidates using the Paired Sample Test and effect size. The results of the paired t test and the results of the effect size are presented in **Table 2.**

Table 2. The results of the paired sample test of CHCC and effect size.

Group	Sample	Paired Sample Test, A = 5%				Effect Size
		Mean	t	df	P (sig.)	
SLLWC	32	-2.02	-65.71	31	.000	0.94 (High effect)
CLM	32	-0.15	-4.74	31	.000	0.29 (Low effect)

Note = SLLWC (science learning based on the local wisdom context); CLM (conventional learning model)

Table 2. shows that the average score of CHCC for science learning based on the context of local wisdom and conventional models is -2.02 and -0.15 with degrees of freedom (df) is 31, and gives t values of -65.71 and -4 ,74. The results of the Paired Sample Test for each group are significant, because p <0.05. Because the t value is negative, it is clear that there is a significant difference at α = 5% between the CHCC pretest and posttest scores in science learning based on local wisdom contexts and conventional models. For learning science learning based on local wisdom contexts and conventional learning models, all of them showed higher posttest scores compared to pretest scores, or the average CHCC score of science bachelor candidates after science learning based on local wisdom contexts and conventional was higher than before. However, the effect size of science learning based on local wisdom context is higher (high) than the conventional model (low) in increasing the CHCC of science bachelor candidates. Based on the results of the effect size, it can be concluded that science learning based on the context of local wisdom has a major effect on the high CHCC of science bachelor candidates.

Table 3. The CHCC Indicator of the Science Learning based on Local Wisdom Context and Conventional Model

Group		**Indicators of Cultural Heritage Conservation Character**						**Average**
		1		**2**		**3**		
SLLWC	O_1	1.00	L	0.30	L	0.59	L	0.90
	O_2	3.00	H	2.85	H	2.62	H	(High
	<g>	1.00	H	0.94	H	1.00	H	effect)
CLM	O_1	1.00	L	0.42	L	0.48	L	0.29
	O_2	1.35	M	0.74	M	0.52	L	(Low
	<g>	0.17	L	0.12	L	0.01	L	effect)

Note = O_1 (Pre-test); O_2 (Post-test); <g> (N-gain); L (Low); M (Moderate); H (High); SLLWC (science learning based on the local wisdom context); CLM (conventional learning model); (1 (identification of the cultural heritage values), 2 (protecting cultural heritage objects), 3 (building the nation's cultural resilience)

Table 3 explains that prior to learning the results of all CHCC indicators (Science learning in the context of local wisdom and conventional learning models) were in the low category. Positive results were seen after the application of Science Learning in the context of local wisdom that all CHCC indicators for Science bachelor candidates were in the high category.

However, negative results were obtained in the conventional learning model where only 1 CHCC indicator (namely identification of the cultural heritage values) was in the medium category, the others were only in the low category. Another positive finding from this study is that the N gain of all CHCC science bachelor candidates after using science learning in the context of local wisdom is in the high category. However, the results of the implementation of the conventional model show that the N gain of all CHCC indicators for science bachelor candidates is in the low category.

To analyze science learning in the context of local wisdom or conventional learning models, it is more effective in increasing the CHCC of science bachelor candidates, by using an Independent Sample Test on the average N CHCC gain of science bachelor candidates. An Independent Sample Test for an average N gain was carried out in science learning in the context of local wisdom and conventional learning models. The results of the Independent Sample Test average N gain for Science learning

in the context of local wisdom and conventional learning models are presented in **Table 4.**

Table 4. Independent Sample Test Results on the Average N-gain for the science learning in the context of local wisdom and Conventional Learning Model

Group	Sample	Independent Sample Test				
		Mean	Std. error mean	t	df	P (sig.)
SLLWC & CLM	32	0.92	0.02	48.35	62	.000

Table 4 explains the difference in the average N-gain CHCC for science learning in the context of local wisdom and conventional learning models is 0.92. It is proven that the score is significant, because p <0.05. These results prove that there is a significant difference in the average CHCC N-gain score in science learning in the context of local wisdom and conventional learning models, each at α = 5%.

4. Discussion

The effect of science learning based on the local wisdom context on the cultural heritage conservation character of science bachelor candidates can be seen when identifying problems through enculturation of local wisdom from field observations and interviews related to the process of making Madura keris using certain tools and materials, solving problems based on local wisdom in the form of measurements/ mathematical concentration of each material used to make an aesthetic Madura keris through group discussions, reconstructing the findings of the formula for the sequence of stages/procedures for making Madurese keris and the mathematical dosage/concentration of each material used through the assimilation of local wisdom from collaboration in making designs, communicating the results of problem solving in an scientifically through certain posters/media, evaluating the process through the acculturation of local wisdom, which is studied theoretically and empirically through tests.

Observations regarding the procedures for making a distinctive and aesthetic Madurese keris were carried out by students to the community and the Madurese keris craftsmen association in Aeng Tong Tong village, Sumenep-Madura. Students determine the key questions that will be examined related to community knowledge about the making of distinctive and aesthetic Madurese keris against the background of the local environment, social, culture, which cannot be separated from certain natural science material concepts. Students conducted interviews with informants (a keris master and chairman of the Madurese keris craftsmen association) to explore community knowledge that has been passed down from generation to generation, which is considered as indigenous knowledge. These observation and interview activities can support science bachelor candidates identify the values of the Madura keris as cultural heritage, which is the first indicator of cultural heritage conservation character (Norren & Beehner, 2021; Burduk et al., 2021; Mungmachon, 2013; Atalan, 2018).

The results of the interviews with the informants were then discussed by science bachelor candidates with their group members to solve problems based on local wisdom in the form of a mathematical concentration/measurement for each material used to make an aesthetic Madura keris. The solution to the problem is proving indigenous knowledge to become scientific knowledge using literature studies, case studies, field trials and certain experiments. This evidence is needed to strengthen, add to, or refute indigenous knowledge that has been passed down from generation to generation among the community. This is necessary to educate the public so that they know the truth of

indigenous knowledge so far accompanied by consideration of reasons and scientific evidence that can be accounted for. In accordance with the opinion of the research results of Gondwe & Longnecker (2014), Suastra, (2010) dan Yasir et al. (2020) proving local wisdom as the truth that has become a tradition in an area is carried out so that people's views and life strategies are not wrong.

It is when solving problems based on local wisdom that science bachelor candidates directly or indirectly also study the concepts of science material related to indigenous knowledge and scientific knowledge. The concept of natural science material studied by science bachelor candidates from Madura kerises is the effort and energy of the keris master, certain tools as simple machines to facilitate work, material science elements/compound materials from 3 things, namely iron, steel, and nickel, and the master's body control system. keris to forge, shape, bring out the style and prestige of the Madurese keris that is made, complete with pancor, sheath, and wilah. Proof of indigenous knowledge with scientific knowledge inspires science bachelor candidates to be able to protect cultural heritage objects and build national cultural resilience, which are the second and third indicators of cultural heritage conservation character, as well as train thinking, collaboration and communication skills through a scientific approach (Koizumi, 2017; Achille & Fiorillo, 2022; Hoskara et al., 2023).

Solving problems based on local wisdom collaboratively in groups produces a finding. The findings of the formula for the sequence of stages/procedures for making Madura keris and the mathematical dosage/concentration of each material used were reconstructed through the assimilation of local wisdom from collaboration in making designs. An example of the findings of the formula obtained is that there are several criteria for iron for making a keris, one of which is that you must use iron that is hard, so it doesn't melt quickly, namely steel and titanium. In addition to selecting the right iron, it is also necessary to pay attention to the abilities and skills of the master of the keris, because when the same iron is put into the coals of a different temperature, the results will also be different. The making of a keris is also like a layer cake, that is, in layers to be forged into one.

Students communicate the results of solving problems scientifically through certain posters/media. Certain posters/media contain the results of scientific writing explanations, charts/graphics made, as well as a summary of scientific information. Certain posters/media are communicated through presentations to exchange opinions, get input and suggestions from other groups and lecturers. Presentations are carried out by conveying ideas, data collection processes, results, reconstruction of scientific findings. Students explain information effectively, in detail and systematically, present the results of group/individual work, describe the characteristics of the object under study. Good communication techniques make the studies presented understandable to the audience. This agrees with Holtorf (2018) dan Hoskara et al. (2023) that protecting cultural heritage objects and building national cultural resilience from cultural heritage conservation characters can be trained through communication and media presentations.

Students evaluate the process through acculturation of local wisdom, which is studied theoretically and empirically through tests. The purpose of the evaluation is to get feedback and self-correction on the process and results of the reconstruction of scientific findings that can add to, strengthen, or refute indigenous knowledge using scientific knowledge. Reasons accompanied by supporting scientific evidence are also needed to complete the reconstruction of scientific findings. The evaluation results that have been carried out are then compiled in the form of a scientific report. This activity is a contribution in protecting cultural heritage objects, and building the nation's cultural resilience (Wiktor-Mach, 2019; Fuadi et al., 2020; Yasir & Wulandari, 2020).

The results of the analysis above show that the average N-gain CHCC science bachelor candidates is higher after learning science in the context of local wisdom and

conventional learning models. Meanwhile, natural science learning in the context of local wisdom provides a higher average N-gain when compared to the conventional model.

The key to learning science in the context of local wisdom is to increase the CHCC of science bachelor candidates who are placed on integrating indigenous local cultural communities through enculturation, assimilation, and acculturation (Yasir, et.al, 2020; Pornpimon et al., 2014). Enculturation, assimilation, and acculturation of indigenous knowledge are proven to be scientific knowledge by means of experiments and scientific literature studies (Kurniawati, et.al, 2017, Mungmachon, 2013).

The process of proving indigenous knowledge to become scientific knowledge is carried out collaboratively so that the local wisdom study data is comprehensive and focused (Gondwe & Longnecker, 2014; Vohland et al., 2021); as well as using citizen science by involving public participation in this case science bachelor candidates and the community in a collaborative research so that the local wisdom study data obtained is comprehensive and focuses on teamwork (Walker, et.al, 2020; Roetman & Daniels, 2011).

In addition, learning based on constructivist theory can increase students' knowledge (Arends, 2012; Moreno, 2010; Slavin, 2011; Sternberg et al., 2018). Strengthening research results about students will support their concepts by transferring to new topics, thereby adding more information (Hariadi et al., 2019; Celik et al., 2011; Nkonieczna & Szczepański, 2023; Naping et al., 2019).

The influence of science learning based on local wisdom context is supported by the results of research (Yasir & Wulandari, 2020; Yasir et al., 2020; Pornpimon et al., 20214; Ilhami et al., 2018) that the products (models, methods, strategies, materials) which meet the validity, practicality, and effectiveness will improve and achieve the learning objectives. Therefore, the of science learning based on local wisdom context proved influence in improving the cultural heritage conservation character of science bachelor candidates.

5. Conclusion

This study reveals that science learning based on the local wisdom context has proven to have an effective influence on improving the cultural heritage conservation character for bachelor science candidates compared to science bachelor candidates using conventional learning models. Regarding the cultural heritage conservation character, SLLWC science bachelor candidates show better performance on all three indicators. All CHCC indicators in science learning based on the local wisdom context for Science bachelor candidates were in the high category and only 1 CHCC indicator in conventional learning models was in the medium category. We realize that involving two groups of science bachelor candidates alone is not sufficient to draw general conclusions; however, these results could serve as a pilot for future studies involving a wider range of respondents and a variety of topics. This research implies that the use of the context of local wisdom in science learning can enhance the character of cultural heritage conservation as an alternative way of preserving and developing cultural and tourism heritage in the era of Sustainable Development. Further research can be done to compare the effectiveness of science learning based on local wisdom context with SIL, MPSBE, and LWIS in science learning.

Authors Contribution: Mochammad Yasir: methodology, conducting the research and writing original article, field data collection, data analysis, and revision. Try Hartiningsih and Annuriya Auliya Rahma: Field data collection data analysis, and revision.

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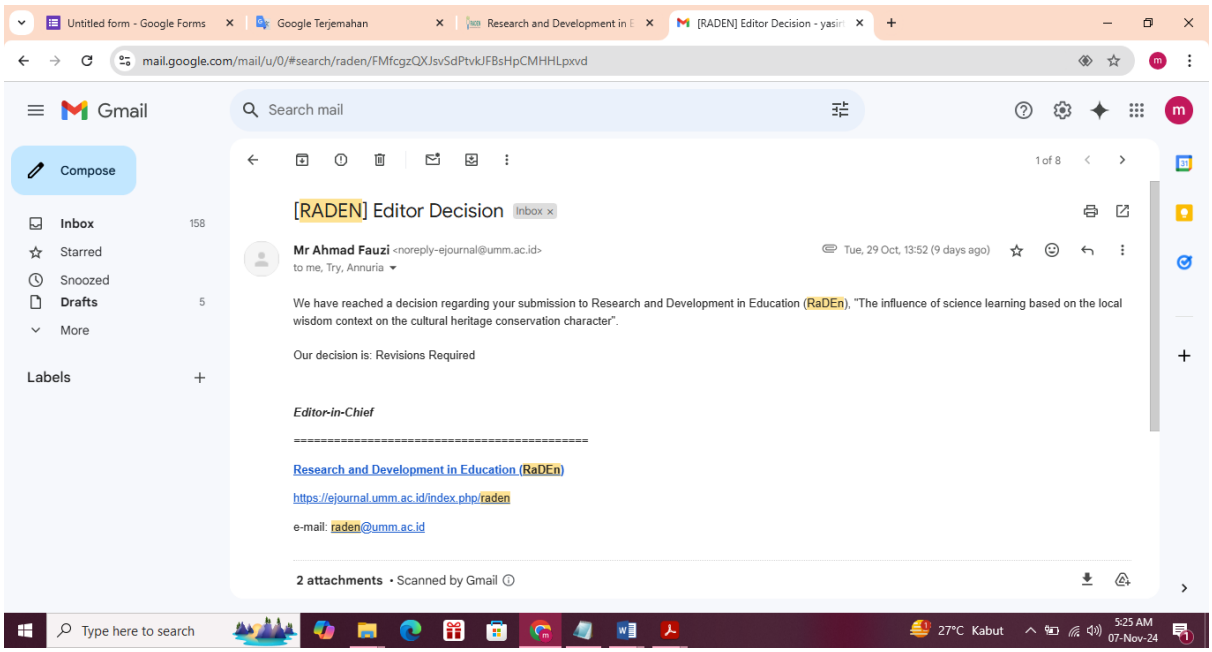
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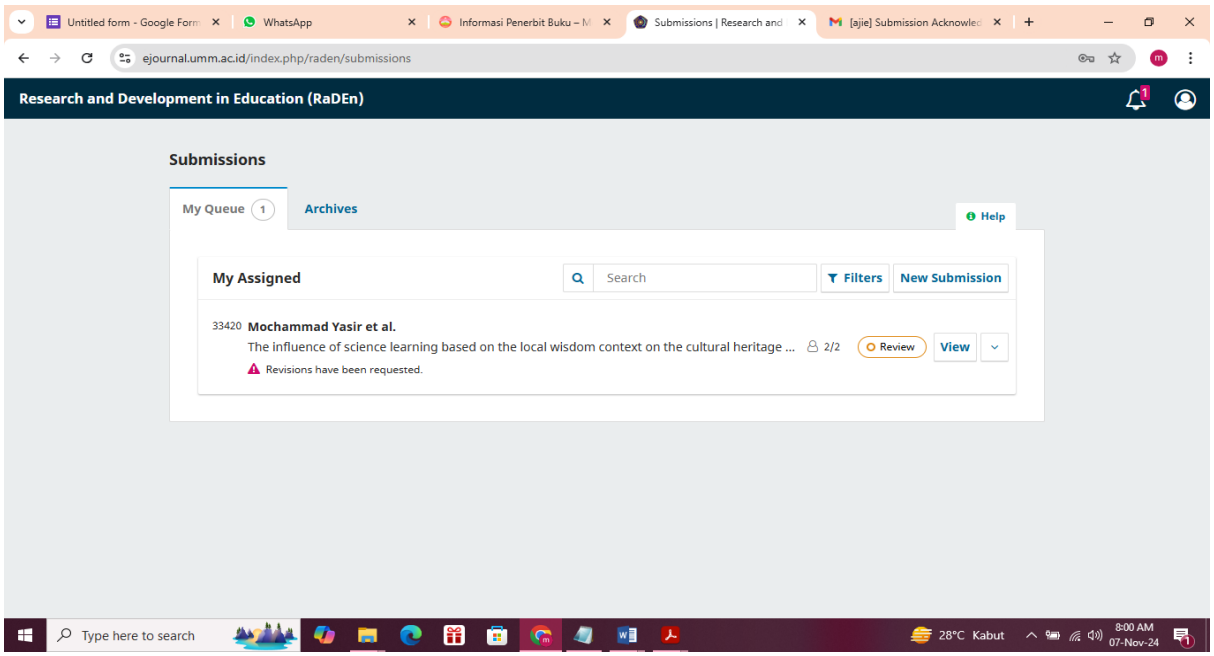
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