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Menyatakan dengan sesungguhnya bahwa artikel saya ini yang berjudul **"ETHHOMATHEMATICS IN THE DESIGN AND VARIETY OF MAIMOON PALACE ORNAMENTS IN MEDAN CITY"** adalah karya saya sendiri. Pengutipan yang terdapat dalam arikel ini dilakukan dengan cara-cara yang sesuai dengan etika keilmuan. Atas pernyataan ini, saya bersedia menerima sanksi sesuai dengan peraturan perundang-undangan yang berlaku apabila suatu hari nanti ada pihak lain yang keberatan terhadap keaslian artikel saya ini atau pengutipan yang sangat kuat adanya unsur plagiasi atau penciplakan atau pengutipan yang melanggar etika keilmuan.

Medan, 10 Januari 2023

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Ethhomathematics in the Design and Variety of Maimoon Palace Ornaments in Medan City

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Abstrak

Pada umum tujuan Penelitian ini dari filosofis yang terdapat dari salah satu wisata di Sumatera Utara tepatnya di kota Medan yang sering disebut Istana Maimoon. Sehingga penelitian ini Mendeskripsikan dari aktivitas yang berkaitan etnomatematika. Penelitian ini menemukan hubungan antara Matematika dalam Bentuk rancang serta Ragam Ornamen Istana Maimoon tersebut. Penelitian ini menggunakan objek dari keduanya yaitu : Titik, Garis, Bidang, Bentuk dan Ruang. Hasil dari penelitian ini juga memiliki konsep dasar yang menggunakan unsur – unsur matematika dalam pelajaran geometri yang terdapat pada rancang dan ornamen Istana Maimoon. Adapun konsep–konsep Matematika tersebut terdapat pengembangan ilmu dasar etnomatematika terhadap pelajaran matematika bidang geometri khusus seperti a). bangun datar, (b). bangun ruang, (c). Konseop garis, dan unsur matematika lainnya (sisi datar, titik, dan sudut). Berdasarkan penelitian ini terdapat hasil dari konsep matematika berhubungan dengan objek utama adalah rancang dan ornamen saat dalam mengunjungi wisata tersebut. Maka terdapat ragam budaya yang diterapkan dalam konsep – konsep Matematika.

***Kata Kunci**: Etnomatematika, Istana Maimoon dan Ornamen*

Abstract

In general, the purpose of this research is from the philosophy contained in one of the tours in North Sumatra, precisely in the city of Medan which is often called the Maimoon Palace. So this research describes the activities related to ethnomathematics. This study found a relationship between Mathematics in the Form of Design and the Variety of Ornaments of the Maimoon Palace. This study uses objects from both namely: Points, Lines, Fields, Shapes and Spaces. The results of this study also have a basic concept that uses mathematical elements in geometry lessons contained in the design and ornaments of the Maimoon Palace. As for the Mathematical concepts, there is the development of basic ethnomathematical science to mathematics lessons in the special geometry field such as a). wake up flat, (b). build space, (c). The concept of lines, and other mathematical elements (flat sides, points, and angles). Based on this research, there are results from mathematical concepts related to the main object, namely design and ornamentation when visiting the tour. So there is a variety of cultures that are applied to mathematical concepts.

***Keywords:** Ethnomathematics, Maimoon Palace and Ornaments*

Introduction

Maimoon Palace Tourism, one of the most beautiful buildings in Medan City, is a tourist destination that can attract the attention of local and foreign tourists. History to record the results of what is found from the Maimoon palace is a luxurious interior building dominated by yellow colors and there are Malay tradition motifs with a blend of European culture. Maimoon Palace has a very unique interior design guided by elements of cultural heritage by the sultanate of Malay culture where there are styles (Islam, Spain, India and Italy). So that it becomes a tourist destination not only because of its old age, but also the history of the Deli Sultanate. But it's a pity that the condition of the Maimoon palace now seems to be poorly maintained.

A culture that we can know is something that has become a habit from a tradition, such as customs that have become a culture that has developed in this modern era. A culture itself has been seen as human knowledge as a social being in the surrounding environment that is used to understand from experience and become a guide for behavior such as customs, beliefs, morals, education, arts, abilities and so on.

Education is a basic need for every individual in society, while culture is a complete and comprehensive unit that applies in a society, its values and ideas are lived by a group of people in a certain environment and in a certain period of time. (Ratna, 2005). In the Ability to develop a mathematical problem-solving approach, namely the ability to understand problems, design mathematical models, complete models and interpret solutions obtained. To be able to state that solving problems is a special ability of intelligence contained in Polya (1890). The knowledge that we must instill in our children is according to the knowledge and understanding of the moral itself. Supriadi (2010:

Culture and society can never be separated from one another. Mathematics is part of culture and history (Fathani, 2009: 87). Culture is a distinctive way of humans in adapting themselves to their environment. This combination of culture, mathematics and education is often referred to as ethnomathematics as mathematics in the environment (math in the environment) or mathematics in the community (math in the community).

The definition of ornament according to Danna Marjono and Suyatno, in his book Education of Fine Arts (1975), essentially ornament is a variety of decorations contained in a place that is adjusted to suit the situation and conditions. It can mean decoration that is well-arranged in a certain field or outside a certain field in order to achieve a goal of beauty that has been known since the introduction of mathematics itself.

Fujiati and Z. Mastur (2014) have proven in their research that in learning using ethnomathematics students are actively involved in looking for local culture in Batang related to geometry, and teachers use teaching aids related to Batang culture so that students' learning motivation increases. It is not surprising that students' attitudes tend to be more appreciative of the existing culture. As a medium of learning, culture and its various manifestations can be the context of examples of concepts or principles in a subject, as well as a context for the application of principles or in a subject. Mathematics is not a universal domain of formal knowledge, but is a collection of representations and symbolic procedures that are constructed systematically. culture in certain community groups (Silvia, 1999: 9).

Method

This study uses qualitative ethnography to determine the results of data on a group culture such as interviews and observations. In explaining a story to people about existing cultural phenomena. To discover more knowledge contained in the culture of the founder of this Maimoon Palace. So this study also uses descriptive qualitative methods with an ethnographic approach. The ethnographic approach in general can be used as an image,

explanation and analysis of the cultural elements of society and ethnicity (Zayyadi, 2017).

As a descriptive qualitative research with an ethnographic approach, of course, this research instrument is a human instrument, meaning that the researcher is the main instrument that cannot be replaced or represented by other people.(Gumilang,2016).Ethnomathematical research can connect elements of mathematics with an activity or culture found in society so that its application in understanding mathematics can be seen clearly in cultural life.(Hasibuan & Ginting, 2021).

Information activities arranged to simplify the process and transformation of research data with written notes from the field as well as data presentation through interviews. So that the research easily draws conclusions in presenting the data in accordance with the information applied by the resource person.

The aims of ethnomathematics in this study are:Ethnomathematics in the Design and Variety of Maimoon Palace Ornaments in Medan CityNorth Sumatra Province. Data collection techniques carried out by researchers with library data, observations and interviews. The library data carried out by the researcher is by exploring the publications of previous research related to one of the Medan city tours, namely Maimoon Palace. Observations that have been made are by observing the detailed form of the tourist visit and also analyzing it either directly or through related literature. While the interview was conducted with one of the object guides who work on the tour who is very experienced in explaining in detail about the Maimun Palace as one of the tourist cultures in the city of Medan which is located on Jl. Brigadier General Katamso No. 66, AUR Medan Maimun District, North Sumatra.

Results and Discussion

Based on the researcher, there are these results through library research, interviews, observations, and documentation, this Medan

city tour of Maimun Palace is based on the design form in accordance with the form of material that is Geometry. The design of the shape of the Maimoon palace is in accordance with the forms and mathematical concepts that can be seen from the object.

Maimoon Palace Tour is one of the most beautiful buildings in the city of Medan, North Sumatra, which is located in the Sukaraja village, Medan Maimoon sub-district.on Jl. Brigadier General Katamso No. 66, AUR Medan Maimun District, North Sumatra.Which was established in 1891 with approximately 11 years to complete under construction from 1988 to 1891. An architect designed in which an upper Dutch royal army was ruled by the Sultan of Deli, by the name of the sultan Ma'moen Al Rasyid Perkasa Alamsyah, under construction Maimoon Palace has an area of 2,772 m2 which has two floors with 30 rooms. There are 40 rooms, of which 20 are upstairs and the Sultan's throne and 20 are downstairs. However, there are some excluding rooms such as the bathroom, storeroom, kitchen, and prison downstairs. So that it is interesting for researchers to observe the architectural design of the palace. The combination of cultural characteristics between Islamic traditions and European culture.

Picture 1. Maimoon Palace Tour

Is closely related to the position and orientation of a person in the natural environment and related to all the objects produced. So that making design is also closely related to other ethnomathematical activities which are often called counting activities.

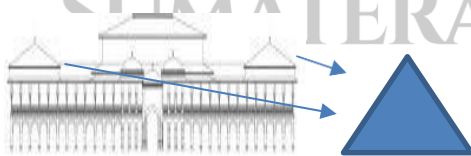**Picture 2. Maimoon Palace Tour**

Mathematical Geometry Concepts

Based on the results of the research, there were forms that existed in the design of the Maimoon palace before it became a tourist destination in Medan City. The image obtained is the initial design of the Maimoon palace in accordance with the mathematical concepts that are the results of this study.


Istana Maimun

Picture 3. Maimoon Palace Tour Plan Two-dimentional Picture

Flat shape is a branch of mathematics obtained from elementary school so that it is a university that explains the basic concepts of geometry for two-dimensional shapes. Flat shapes study the relationship of points, lines, angles, planes and a plane bounded by straight lines or curved lines. The flat shapes found in the Maimoon palace building are as shown in the picture:

Picture 4. Triangle design

The design in the form of a triangle contained in the Maimoon palace tour is the roof of the right and left trough.
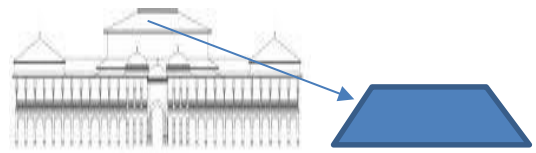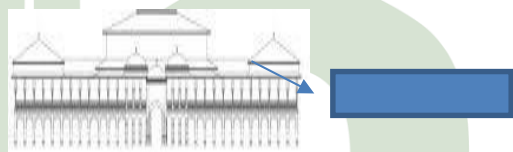

Picture 5. Design in the form of a Traphesium

The design in the form of a trapezoid contained in the Maimoon Palace tour is the main part of the roof
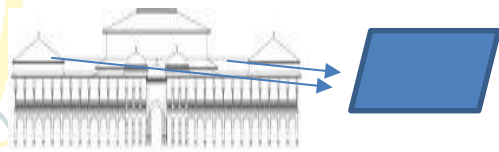
Picture 6. Design in the form of a parallelogram

The design is in the form of a parallelogram found on the Maimoon Palace tour, which is the side next to the main roof

Picture 7. Design in the form of a rectangle

The design in the form of a rectangle contained in the Maimoon palace tour is the bottom of the roof.

Geometry

Building Space is a branch of mathematics that explains the basic concepts of geometry for three-dimensional shapes. Building Spaces studies mathematical shapes that have content or volume by having 3 components, namely sides, edges and vertices. The concept of three-dimensional geometry found in Maimoon palace tours is in the beam-shaped support pole. Build the space contained in the Maimoon palace building such as the picture:

Picture 8. Design in the form of building space
Line Concept

The simplest branch of mathematics is the concept of a line which is included in the field of Geometry. In the element of art, the line itself has the ability to express an impression of beauty. In the design of the Maimoon palace there are vertical and horizontal lines. The straight lines found in Maimoon palace tours have the meaning of firm, rigid and strong. The concept of lines contained in the Maimoon palace building include the following picture:
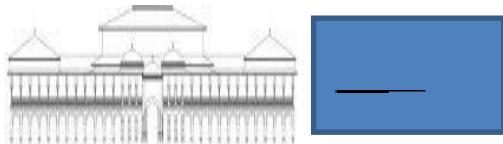
Picture 9. Maimoon palace design in the form of a line concept

Maimoon Palace is a tourist destination because it has a unique architectural concept, is beautiful, and has a characteristic traditional Indonesian element with a Malay touch, both the shape and ornaments are influenced by various cultures, including Malay, Moghul, Middle Eastern, Spanish, Indian, and Dutch. This building is also dominated by a golden yellow color which is identical to the Malay ethnicity.

The palace consists of two floors which are divided into three parts, which are the main building (balairung), the left wing, and the right wing. In front, about 100 meters, stands the Al-Maksum Mosque, known as the Great Mosque of Medan. The analysis used is qualitative data analysis method which is presented descriptively and interpretively (interpretation), using observational data. Qualitative data analysis is an effort made by organizing data, sorting it into manageable units, synthesizing it, looking for and finding patterns, finding what is important and what is learned, and deciding what can be told to

others (Bogdan and Biklen). in Moleong, 2009: 248).

Sunaryo's opinion (2009: 3) in his book Ornaments Nusantara explains that: Ornament is the application of decoration to a product. The forms of decoration that become ornaments, the main function is to beautify the product or item that is decorated. The product may already be beautiful, but after adding ornaments to it, it is hoped that it will make it even more beautiful.

Where the researchers found the ornaments contained in this main building, among others, crystal lamps, fans, displays, tables, chairs, cupboards. In this building is a characteristic of the Middle East, Turkey, and India also adorn this hall.

Picture 10. The Hall of the Maimun Palace in Medan

Ornament is a form of variety or decoration that is attached to a room that has the function and aesthetic value of the room. and can summarize in general its nature, in order to give special characteristics to the elements, fields, rhythms, lines, colors and their relation to each other, which combine to form a decorative variety. The room ornaments in the room ornaments are: wall ornaments, floor ornaments, building construction ornaments and ceiling ornaments. As the researchers got on the Maimoon Palace tour which is very related to the basic concepts of geometry in the following table:

Table 1. Shapes of space ornaments at Maimoon palace

Bentuk Ornamen pada Ruang	Nama Ornamen	Bentuk Geometri	Konsep Matematika
	Bunga Matahari		Segi Empat, simetris, Titik, Garis dan Sudut
	Tembakau		Lingkaran, titik Pusat,simetri Putar dan titik busur
	Pucuk Rebung		Segitiga, titik sudut, simetri Lipat dan simetri Putar
	Bunga Kundur		Lingkaran, titik Pusat,simetri Putar dan titik busur
	Bunga Kendur		Jajar genjang, memiliki sisi, titik sudut, simetri lipat dan simetri Putar.
	Bunga Melur		Persegi, segiempat, simetri lipat, semetri putar.

The study of geometry is one part of the education curriculum in Indonesia which is taught at the elementary school to university level(Pratiwi & Pujiastuti, 2020). On Maimun

Palace has its architectural conceptthere is a study of geometry that is in the shape of the hall and complementary ornaments such as rectangular pyramids, squares, trapezoids, isosceles triangles, rectangles, rhombuses, tubes, right triangles, curved lines, intersecting lines, and parallel lines.

Conclusion

From this research and discussion, it can be concluded thatEthnomathematics in the Design and Variety of Maimoon Palace Ornaments in Medan City. There is a study of geometric concepts found in supporting ornaments such as the concepts contained in the results and discussion.Activities in the design there are sources of ideas of other

sciences such as mathematics which is very important and universal in an activity there is a design of ethnic and cultural types. The forms of ornaments on Maimoon palace tours add to the beauty of the room. In addition to ornamental motifs, the room is filled with various unique interior designs such as wardrobe furniture, chairs, and European-style crystal chandeliers.OnMaimun Palace has its architectural conceptthere is a study of geometry in the form of the hall and complementary ornaments such as pyramids, rectangles, squares, trapezoids, isosceles triangles, rectangles, rhombuses, tubes, right triangles, curved lines, intersecting lines, and parallel lines.. Ethnomathematics on Maimoon Palace Ornamentsis expected to be a new breakthrough to promote concepts in mathematics learning by linking Malay culture in North Sumatra.

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DAFTAR RIWAYAT HIDUP

Nur Azizah Auliallah Li Muchand, lahir di Medan pada tanggal 01 September 2000. Penulis lahir dan dibesarkan oleh Bapak H. Muchlis dan ibu Andriani Siregar dan merupakan anak kelima dari lima bersaudara. Saat ini penulis tinggal bersama kedua orangtua di Jalan Cimanuk No.14 Belawan II , Kecamatan Medan Belawan ,Sumatera Utara.

Penulis menempuh pendidikan dimulai dari TK Bahari Medan lulus pada tahun 2006. Meneruskan sekolah dasar di SD Negeri 060969 Medan lulus pada tahun 2012. Melanjutkan sekolah menengah pertama di SMP Negeri 44 Medan lulus pada tahun 2015. Selanjutnya penulis masuk sekolah menengah atas di SMA Negeri 20 Medan lulus pada tahun 2018. Pada tahun yang sama penulis diterima sebagai mahasiswi Jurusan Pendidikan Matematika Universitas Islam Negeri (UIN) Sumatera Utara hingga tahun 2022 saat artikel ini selesai.

Pada tahun 2018 penulis aktif di organisasi Resimen Mahasiswa (Menwa), di bulan Febuari 2020 penulis mengikuti Pendidikan Dasar Militer Resimen Mahasiswa (Diksamil Menwa) Se-Sumatera Utara di Rindam I/BB Pemantang Siantar. Kemudian di tahun 2021 penulis mengikuti kegiatan LATSITARDA NUSANTARA XLI/2021 SUMUT di Kabupaten Deli Serdang dan Kota Tebing Tinggi.

Dengan ketekunan, motivasi tinggi untuk terus belajar dan berusaha, penulis telah berhasil menyelesaikan pengerjaan tugas akhir artikel ini. Semoga dengan penulisan tugas akhir artikel ini memberikan konstribusi positif bagi dunia pendidikan

Akhir kata penulis mengucapkan rasa syukur yang sebesar-besarnya atas terselesaikannya artikel yang berjudul **"Ethhomathematics In The Design And Variety Of Maimoon Palace Ornaments In Medan City".**

Yang Membuat

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