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THE USE OF EMOJIS IN THE REPRESENTATION OF THEMATIC DATA: A SCHOOL CARTOGRAPHY PRACTICE

O uso de emojis na representação de dados temáticos: uma prática de cartografia escolar

El uso de emojis en la representación de datos temáticos: una práctica de cartografía escolar

Eric Moisés BEILFUSS – Universidade Federal de Santa Maria (UFSM)
ORCID ID: https://orcid.org/0000-0002-8094-8330
URL: http://lattes.cnpq.br/3568471943681340
EMAIL: ericmoisesb@outlook.com

Franciele Delevati BEN – Universidade Federal de Santa Maria (UFSM)
ORCID ID: https://orcid.org/0000-0002-6608-4070
URL: http://lattes.cnpq.br/3425530894018035
EMAIL: francielidelevattiben@gmail.com

Carina PETSCH – Universidade Federal de Santa Maria (UFSM)
ORCID ID: https://orcid.org/0000-0002-1079-0080
URL: http://lattes.cnpq.br/7698486004905745
EMAIL: carinapetsch@gmail.com

Romario TRENTIN – Universidade Federal de Santa Maria (UFSM)
ORCID ID: https://orcid.org/0000-0002-0615-2801
URL: http://lattes.cnpq.br/2287005710639329
EMAIL: romario.trentin@gmail.com

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ABSTRACT

School Cartography has emerged at the interface between Geography, Teaching, and Cartography, and is therefore aimed at introducing Cartography into basic education. With this in mind, this article aims to use emojis to graphically represent thematic data in the school environment. Methodologically, students were given emoji cards to represent socio-economic, agricultural, and population data on base maps of the municipalities of Jari (RS) and Nova Esperança do Sul (RS) and neighboring municipalities. During the workshop, the students were enthusiastic about drawing up maps with emojis, as they were dealing with thematic data from their living space. However, it is worth noting that they found it easier to represent qualitative data than quantitative data. They mostly used emojis with facial expressions rather than pictorial symbols to represent the data. As a result, many people resorted to using expression emojis, denoting happiness and sadness about a greater or lesser amount of data, respectively. As for emotional aspects, the students identified with soybean production, the main crop in the municipalities, which was commonly represented by money bills or the goods that would be acquired with the income from the crop. As such, the proposed workshops contributed to increasing local and regional geographical knowledge and promoted the students' Cartographic Literacy.

Keywords: Cartographic language; Spatial Representation; Geography Teaching.
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RESUMO

A Cartografia escolar surgiu na interface entre a Geografia, Ensino e Cartografia, portanto, voltada a inserção da Cartografia na educação básica. Diante disso, o objetivo deste artigo é utilizar os emojis como ferramenta de representação gráfica de dados temáticos, no ambiente escolar. Metodologicamente, foram disponibilizadas cartelas de emojis para os estudantes representarem dados socioeconômicos, agropecuários e populacionais nos mapas base do município de Jari (RS) e Nova Esperança do Sul (RS) e municípios limítrofes. Ao longo da oficina, os estudantes demonstraram-se empolgados para elaborarem mapas com emojis, pois tratava-se de dados temáticos do seu espaço de vivência. Contudo, salienta-se que demonstraram maior facilidade na representação de dados qualitativos, em relação aos dados quantitativos. Foram utilizados, em sua maioria, emojis com expressões faciais, do que os símbolos pictóricos para representar os dados. Diante disso, muitos recorreram ao uso de emojis de expressão, denotando felicidade e tristeza em relação a maior ou menor quantidade de dados, respectivamente. Quanto aos aspectos emocionais, os(as) alunos(as) se identificaram com a produção de soja, principal cultura dos municípios, sendo representada comumente por notas de dinheiro ou pelos bens que seriam adquiridos com a renda da cultura. Sendo assim, as oficinas propostas contribuíram para aumentar o conhecimento geográfico local e regional, e promoveu a Alfabetização e Letramento Cartográfico dos (as) alunos (as).

Palavras-chave: Linguagem Cartográfica; Representação Espacial; Ensino de Geografia.

RESUMEN

La Cartografía Escolar surgió en la interfaz entre Geografía, Enseñanza y Cartografía, por lo tanto, con el objetivo de insertar la Cartografía en la educación básica. Por ello, el objetivo de este artículo es utilizar los emojis como herramienta de representación gráfica de datos temáticos en el ámbito escolar. Metodológicamente, se pusieron a disposición de los estudiantes tarjetas emoji para representar datos socioeconómicos, agrícolas y poblacionales en los mapas base de los municipios de Jari (RS) y Nova Esperança do Sul (RS) y municipios vecinos. A lo largo del taller, los estudiantes se entusiasmaron al crear mapas con emojis, ya que eran datos temáticos de su espacio vital. Sin embargo, cabe señalar que demostraron mayor facilidad para representar datos cualitativos, en relación con los datos cuantitativos. En su mayoría, se utilizaron emojis con expresiones faciales en lugar de símbolos pictóricos para representar los datos. Ante esto, muchos recurrieron al uso de emojis de expresión, denotando felicidad y tristeza en relación a una mayor o menor cantidad de datos, respectivamente. En cuanto a los aspectos emocionales, los estudiantes se identificaron con la producción de soja, principal cultivo en los municipios, comúnmente representado por billetes o bienes que se adquirirían con los ingresos del cultivo. Por lo tanto, los talleres propuestos contribuyeron a incrementar el conocimiento geográfico local y regional, y promovieron la Alfabetización y la Alfabetización Cartográfica de los estudiantes.

Palabras clave: Lenguaje cartográfico; Representación Espacial; Enseñanza de Geografía.

1 INTRODUCTION

Map-making has been carried out as a human and political practice since the dawn of humanity (Girardi, 2013). However, modern Cartography began its development in the second half of the 19th century, mainly focused on military topography (Archela and Archela,

2002). Cartographic production has always been related to the development of society itself and technological advances. Cartography has thus evolved over the last few centuries, becoming the main method of storage and communication of knowledge of the Earth's surface (Archela and Archela, 2002; Goodchild, 2008; Richter, 2017).

Cartography's concern with education has grown considerably in the last two decades (Almeida and Almeida, 2014; Martinelli, 2017). Thus, at the interface between Cartography, Education, and Geography, School Cartography has emerged as a didactic proposal for working with Cartography in education (Almeida, 2007; Passini, 2007). Therefore, to understand all the information represented on a map, students need to develop the process of Cartographic Literacy (Pissinati and Archela, 2007). According to Breda (2017), Cartographic Literacy is a process aimed at mastering mapping techniques, helping to understand the coding and decoding of maps.

Alongside the process of Cartographic Literacy[1] is *Cartographic Literacy*[2], which according to Breda (2017) is about the social function of representations and encompasses and goes beyond the process of alphabetizing. Breda and Straforini (2020) maintain that the alphabetizing process does not exclude literacy, opting instead for the term alphabetizing *literacy*. Consequently, Richter (2017) emphasizes that in the context of School Cartography, the processes of Cartographic literacy and *Cartographic literacy* need to be part of School Geography.

Martinelli (2017) highlights that the teaching and learning of Thematic Cartography has also undergone adjustments over time. In this regard, the thematic map must fulfill its function to illustrate “what?”, “where?” and “how?” a geographical phenomenon occurs, to ease understanding of differences, similarities and to allow users to visualize correlations (Archela and Théry, 2008). Martinelli (2017, p. 23) points out that:

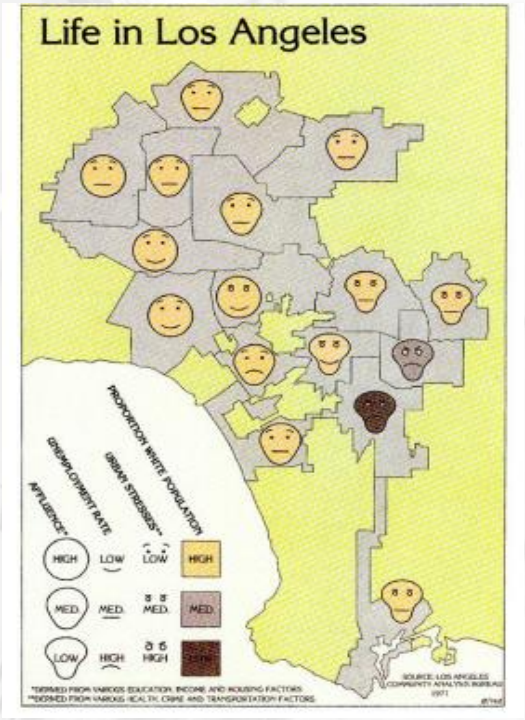
> Cartography, especially Thematic Cartography, has received a lot of criticism for failing to explain aspects, facts, and phenomena of reality. In fact, **Cartography does not explain. It verifies, it reveals**. The fact it reveals the information that is sealed in the data is that it may lead the reader to ask questions, to hypothesize from which a problem arises, the basis for establishing research in search of explanations (Martinelli, 2017, p. 23, emphasis added).

One technique for the representation of thematic data is the use of Chernoff Faces. The Chernoff method was created in 1973, but initially, its purpose was the graphical

[1] Cartographic Literacy defines the concept of Alfabetização Cartográfica (in Portuguese).
[2] *Cartographic Literacy* (with italics) defines the concept of Letramento Cartográfico (in Portuguese).

representation of statistical data. From 1977 onwards, the method was used in Cartography. The maps created using this technique were easier to use due to the use of facial expressions, representing the quantification of data in a more intuitive way. In 1979, Eugene Turner designed the first map called “Life in Los Angeles”, using Chernoff's modified faces (Nuñez, 2010). In this example, there are four variables (wealth, unemployment, urban pressure, and percentage of white population) represented by facial features, highlighting the curve of the corners of the mouth, the slope of the eyebrows, the curvature of the mouth and the color of the face (Figure 01).

Figure 01 – Living Conditions of the Population of Los Angeles (USA), 1971.



Source: Spinelli and Zhou (2004).

Spinelli and Zhou (2004) pointed out that by using the Chernoff technique, the intricate socio-economic phenomena are displayed in a simple and easy-to-understand way. With this in mind, Nascimento and Oliveira (2020) highlighted that Cartography is using the technique to produce and interpret thematic maps, as a possibility for teaching practices. The use of Chernoff faces for mapping data by schoolchildren was found in studies by Nuñez (2010), Castro (2011), Nascimento and Oliveira (2020), and Decarli, Fraga and Carmo (2021).

Chernoff's faces have been adapted to the current school context using emojis. Emojis are increasingly being used in communication by technology, becoming part of the

everyday expression of users. As a result, this has become an emerging topic of research in the academic field (Bai et al. 2019; Shah and Tewari, 2021).

The origin of the word emoji is Japanese and means image characters. They emerged at the end of the 20th century and can represent facial expressions, as well as feelings and emotions, animals, plants, activities, gestures/body parts, and objects (Novak et al. 2015; Bai et al. 2019; Camara et al. 2021).

To highlight research related to the topic, several authors were sought who dealt with the use of emojis in Cartography. Some studies were found, although they did not focus on the educational context. For example, Hauthal et al. (2021) investigated the use of emojis in location-based social media, exploring their relationship with sunset and sunrise events. The results suggested that emojis often provide more detailed information about the user's activities and surroundings than is possible with the use of hashtags.

By contrast, Camara et al. (2021) used emojis to carry out a collaborative mapping of urban mobility in Curitiba (PR). In the survey, participants were interviewed and asked to describe their experiences of urban mobility when using various means of transportation, using emojis as graphic representations to express emotional data. The results revealed that the proposed methodology recorded environmental factors and specific urban characteristics that influence both positive and negative/neutral emotions.

Based on these considerations, the present study is an innovative and up-to-date approach to incorporating emojis into School Cartography. Thus, this article aims to use emojis as a tool for the graphical representation of thematic data in the school environment. This approach aims to enrich the educational process and offer students a more engaging and meaningful experience when learning Geography.

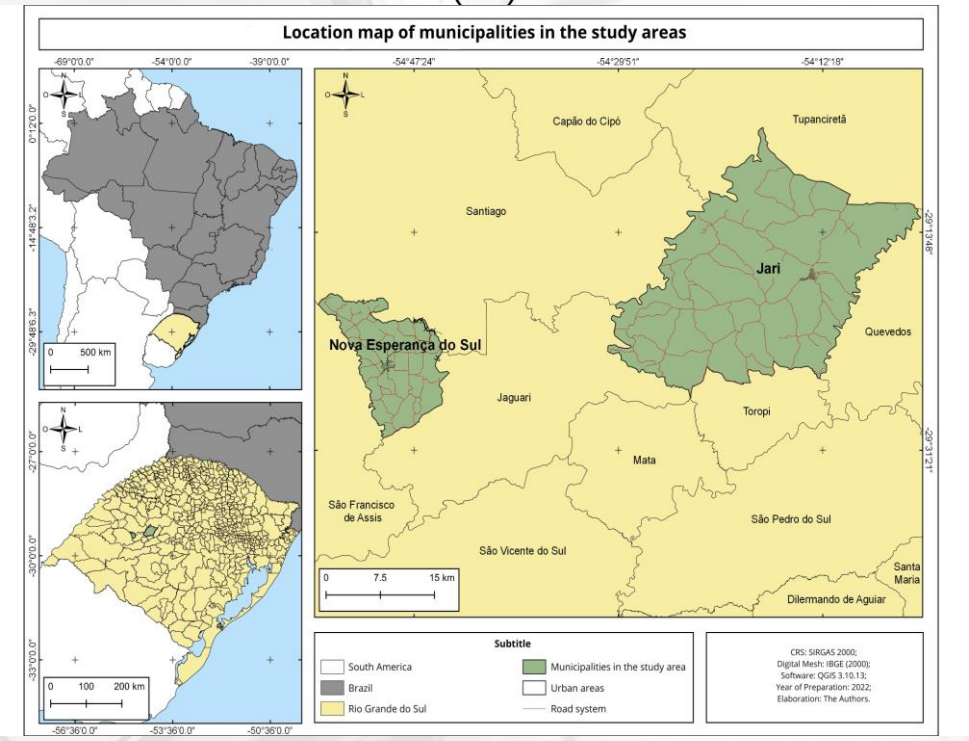
2 STUDY AREA

The implementation of the activity was part of a larger project, which consisted of preparing the Geoenvironmental Atlas of the municipality of Jari (RS) (Beilfuss et al., 2022) and Nova Esperança do Sul (RS) (Ben et al., 2023), both located in the state of Rio Grande do Sul. This project was supported by the municipal education departments and city halls. Thus, the activities were applied in two municipal schools in rural areas and two in urban areas of these municipalities, as chosen by the municipal education departments. In this context, working with municipal schools to develop teaching materials is essential to ensure that students understand the cartographic materials included in the atlas, as proposed by

Passini and De Sá (2009) and Ben et al. (2021).

The municipalities where the proposed activity was carried out were Jari (between -29º03' and -29º27' latitude and -54º27' and -54º03' longitude) and Nova Esperança do Sul (between -29º18' and -29º 30' latitude and -54º54' and -54º 46' longitude), both of which are located in the Midwest region of the state of Rio Grande do Sul, and have a distance of approximately 60 km between their boundaries (Figure 02). It should be noted that the economy in both municipalities is based on agricultural production, particularly soybeans, and livestock, as well as trade, services, plant and animal production, and extraction (IBGE, 2020).

Figure 02 – Location map of the municipalities of Jari (RS) and Nova Esperança do Sul (RS)

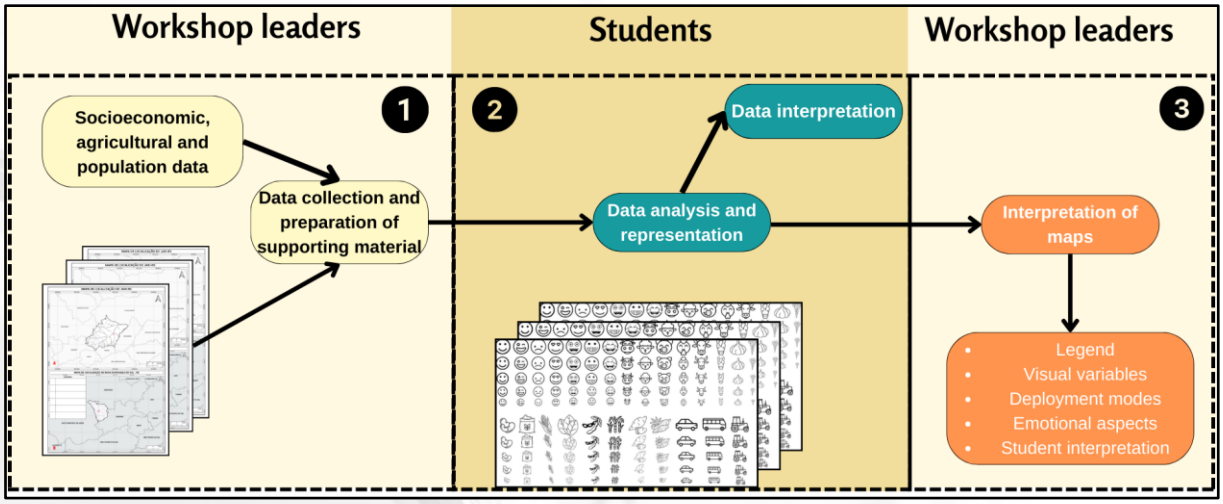


Source: Elaborated by the authors (2022).

3 METHODOLOGICAL PROCEDURES

This article is qualitative and presents data obtained from the graphic representations made by the students, as well as reports and observations made by the workshop leaders. The work had four phases: (i) data collection (ii); analysis and representation (iii); and (iv) interpretation of the information on a map (Figure 03).

Figure 03 – Flowchart used to carry out the work



Source: Elaborated by the Authors (2022).

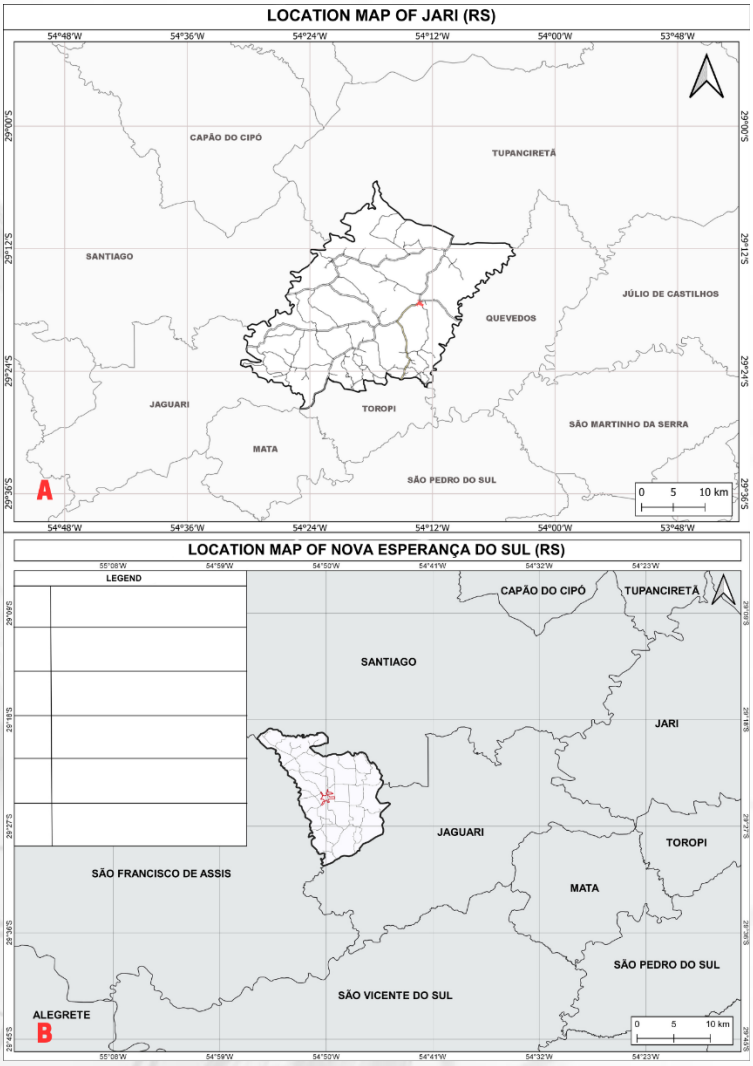
3.1 The research and participants

These workshops lasted 1 hour and 30 minutes and were led by two graduates and a teacher, all with a degree in Geography. These sessions involved sixth graders from the municipalities. Each group had a maximum of 25 students, taking into account the distancing guidelines required due to the COVID-19 pandemic, and were held in the spaces made available by the schools. In total, 90 students took part in the activity.

4.2 Data collection and preparation of support material

For the development of the teaching material, we used data available on the platform of the Brazilian Institute of Geography and Statistics (IBGE) and the Department of Economics and Statistics of the State of Rio Grande do Sul (FEE), for the period from 2018 to 2021. The data refers to the municipalities under study and other neighboring municipalities of Jari (RS) and Nova Esperança do Sul (RS) (Figure 04). Data with qualitative, ordered, or quantitative properties was chosen, allowing the students to use different methods and visual variables suitable for their representation.

Figure 04 – Base map provided to students for creating their thematic maps of the municipalities of Jari (RS) (A) and Nova Esperança do Sul (B)



Source: Elaborated by the Authors (2022).

The base map (Figure 04) was developed using QGIS software version 3.14.16 and QGIS version 3.10.13, based on the digital grids with the municipal boundaries of the state of Rio Grande do Sul, available on the IBGE platform for 2020. It is also worth noting that data from the OpenStreetMap platform and Hasenack and Weber's (2010) cartographic base were used to add the road system of the municipalities in question.

The maps were provided on an A4-size sheet of paper, as proposed by Camara et al. (2021), for each student. The data used for the cartographic representations was related to livestock, agriculture (permanent crops and temporary crops), education, transportation, demographics, the Municipal Human Development Index (MHDI), and Gross Domestic Product (GDP) per capita (Chart 01).

Chart 01 – Data collection stage used to develop the workshop

Theme	Type of data	Year of publication
Livestock (herd production)	Cattle, buffalo, horses, chickens, sheep and pigs	2019
Agriculture (total harvested production in hectares) - Permanent crops	Orange, Peach, Tangerine and Grape	2020
Agriculture (total harvested production in hectares) - Temporary crops	Garlic, Rice, Sweet Potatoes, Sugarcane, Beans, Tobacco, Cassava, Soybeans and Wheat	2020
Education (total number of schools)	Kindergarten, Elementary and High School	2018
Transportation (total number of vehicles registered by type)	Cargo, Passengers and Others*	2020
Demographics (estimate)	Population	2018
Forestry (quantity produced in m^3)	Charcoal, firewood, and logs	2020
MHDI	-	2020
GDP	-	2020

Source: Organized by the authors (2022).

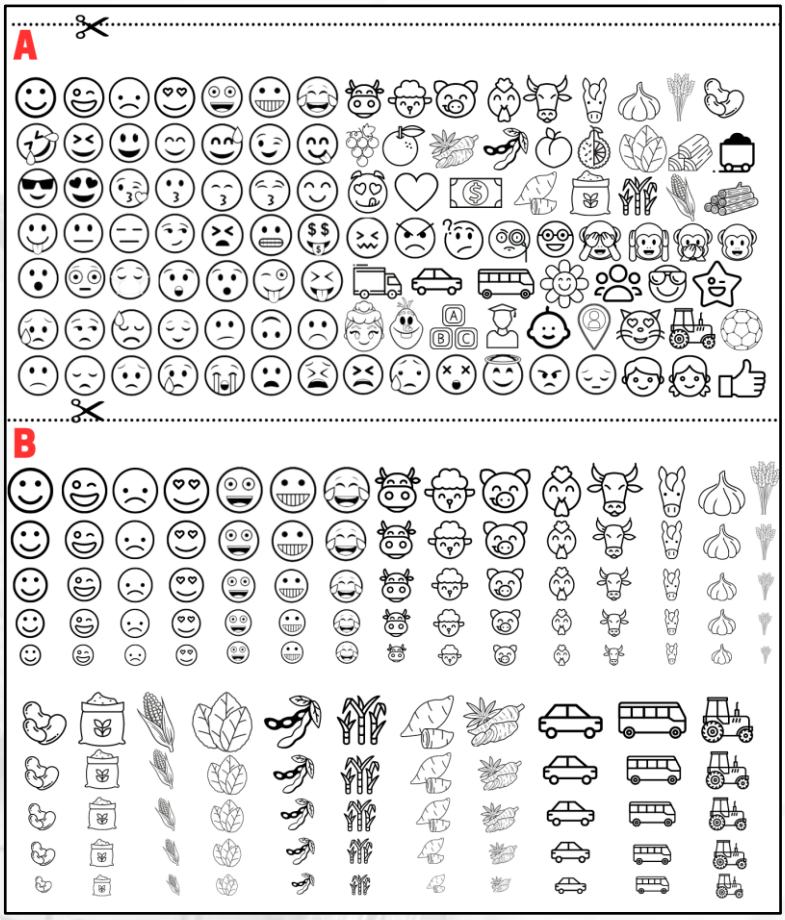
For the presentation of the workshop, slides were prepared and a question was asked about the use of emojis in everyday life. The slides sought to explain to the students how to graph the data, as well as understand the subject matter.

4.3 Data analysis and representation by students

In the workshop, each student received a base map, a chart, and a card with different emojis that could be cut out, painted, or drawn to represent the data in the charts. Due to the number of students in the classes, some received the same data tables, but the idea was to encourage individual work on graphic representation.

Considering the results from the workshop in Jari (RS) (Figure 05 A), adaptations were made for the workshop in Nova Esperança do Sul (RS), making emojis of different sizes available (Figure 05 B). At the end of the activity, the students wrote a report interpreting the data represented with emojis.

Figure 05 – (A) Emoji cards from the municipality of Jari (RS) (B) Emoji cards from the municipality of Nova Esperança do Sul (RS)



Source: Organized by the Authors (2022).

4.4 Map interpretation

It is worth highlighting that an evaluation methodology was created for the maps developed by the students. The first assessment was based on an analysis of the legends drawn up by the participants, examining how the emojis were used to inform and describe the data on the base map. In the second step, the application of visual variables proposed by Bertin (1967) (size, value, color, orientation, shape, and granulation) was considered. In addition, the assessment included an analysis of the different deployment modes used by the students, such as point, linear, and zonal.

In fourth place, the emotional aspects were taken into account, by analyzing the insertion of emojis expressing the students' feelings about the place. Lastly, the fifth form of evaluation consisted of studying the interpretation provided verbally by the students

throughout the workshop, as well as the considerations expressed in writing at the end of the activity.

5 RESULTS AND DISCUSSIONS

This section of the paper is designed to present the perceptions of the application of the workshop, and the data obtained from the participation of students from the municipality of Nova Esperança do Sul (RS).

5.1 Test application: recalculating route

In the first municipality where the workshop was held, Jari (RS), it was possible to see that there were some methodological inconsistencies during its application. One of the perceived difficulties was the exchange of tables between students, which resulted in maps representing different data. In addition, emojis were used to represent quantitative data, without any justification, and legends were made on top of the data represented on the base map.

Given the inconsistencies observed, some changes were made to the second application, in Nova Esperança do Sul (RS). In addition, an extra set of emojis was added, in different sizes, to make it easier to represent quantitative data. Students were also asked to give feedback on the workshop to see whether or not they had understood what had been proposed. In addition, more space was added to the base map for the legend.

It is important to highlight that adaptation plays a key role in meeting the diverse learning needs of students. In this context, it becomes crucial to identify how this resource can be optimized to provide a more effective learning experience for them (Morán, 2015; Bacich, 2018). In this way, the results obtained in the municipality of Jari (RS) were taken into account to make adaptations to the workshop; however, they were not included in this work.

5.2 First contact with the students and data representation

Most of the students interacted at the start of the workshop, indicating that they use emojis on social media and that their favorites, in most cases, are those of animals and faces/expressions. Later on, when the main data that would be used in the workshop was

presented, there was also a great deal of participation from the students, who interacted through personal stories linked to their everyday family life, mainly involving livestock and agriculture.

On the other hand, it was noted that many students did not know about some of the crops grown in Nova Esperança do Sul (RS), such as garlic, grapes, and buffalo farming. Another topic that generated a lot of interaction was the number of schools in the municipalities of application and neighboring municipalities. The students reported that some of them had already been closed down and that others had recently opened. This led to a debate on the timeliness of the data and on how censuses are carried out in Brazil.

While the students were creating the maps, the workshop leaders constantly helped them by going to their classrooms and encouraging them to develop and represent the emojis freely. Once again, some data caught the attention of the participants during the representation, such as the existence of tobacco, corn, rice, soybean, and cassava plantations, among others, and the presence of pigs and cattle. At every stage of the workshop, the participants identified with some of the data, so there was an appreciation of the study of place, proposed by authors such as Callai (2013); Robaina et al. (2015); and Ben et al. (2021).

Furthermore, the students also reported on the municipalities they had already visited, such as Santiago, São Pedro do Sul, Alegrete, Tupanciretã, etc., demonstrating concepts of orientation and location. Passini, Carneiro, and Nogueira (2014) also reflect that Cartographic Literacy inserts the student as a subject in space, enabling them to develop skills such as mapping and reading other representations, enabling them to understand the dynamics of geographical space.

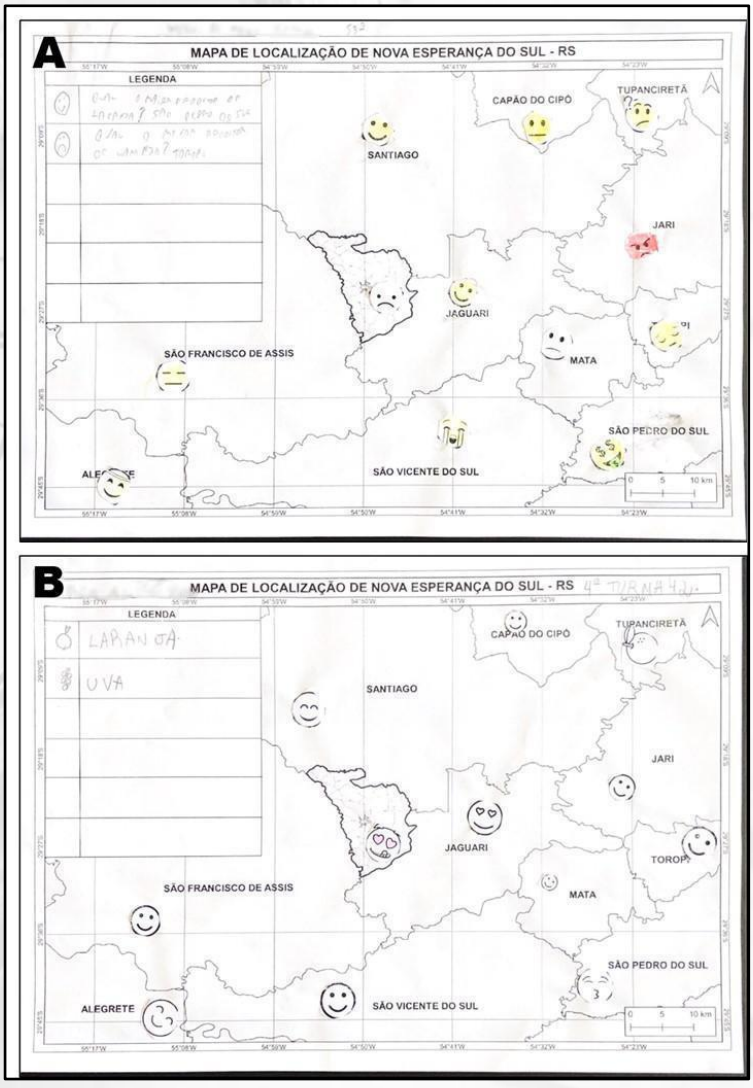
It is worth emphasizing that there were some difficulties commented on by the students, especially regarding the data on the number of registered freight vehicles, MHDI, and GDP, as these are subjects that are not often dealt with in the classroom, according to the participants. In these cases, the workshop leaders tried to use more concrete examples, linking the data to the economy and development of the municipalities.

In general, the whole process of implementing the workshop was satisfactory, as it enabled data to be represented and spatial distribution to be understood. The results are in line with Almeida (2011) who, when considering the use of Chernoff faces, based on a renewed Thematic Cartography, stated that content is assimilated simply, but with complex data. Some graphic representations are worth highlighting and will be presented and discussed below.

5.3 Legend: the level of happiness and sadness in the data

In general, about 40% of the students made the legend according to the emojis used on the base map, while 25% mistakenly used different sizes of emojis for the representation on the map and in the legend. Another 25% of students placed the legend differently from how the data was represented on the base map (Figure 06 A and B), in other words, using different emojis. Only 10% of the students failed to insert the legend, which in most cases was related to a lack of time to complete the activity.

Figure 06 – Maps handed in by the students. A) shows that the student understood the idea of spatialization, but used different emojis; B) shows the use of different emojis, with no association between the legend and the map



Source: Organized by the authors (2022).

Several students have also raised questions about the absence of a legend on the map, indicating that they are used to dealing with maps that have already been drawn up, without the opportunity to engage as conscious mappers, as defined by Simielli (1999). The participants did not understand the association between the legend and the representation on the map. Thus, many wanted to insert the legend before understanding the table and inserting the emojis into the map. Richter (2017, p. 289) adds that “it is a common idea among many students that a map cannot be criticized or altered, that it represents an unquestionable truth”. This indicates deficiencies associated with students' Cartographic Literacy.

It was hoped that, with the use of emojis, students would be more likely to use pictorial symbols, such as cattle, chickens, soybeans, etc. However, there was a prevalence of the use of emojis of expressions, with an association to the level of happiness and sadness, respectively, with the large and small amounts of data. It should be noted that the easiest symbols for any student to learn are pictographic ones, which refer to the graphic image of the object itself, and which practically dispense with legends, therefore valid in School Cartography (Martinelli, 2017). In this way, the students ended up using the idea of Chernoff's methodology with the emojis, due to the variation in expressions caused by the change in eyes, mouth, and eyebrows.

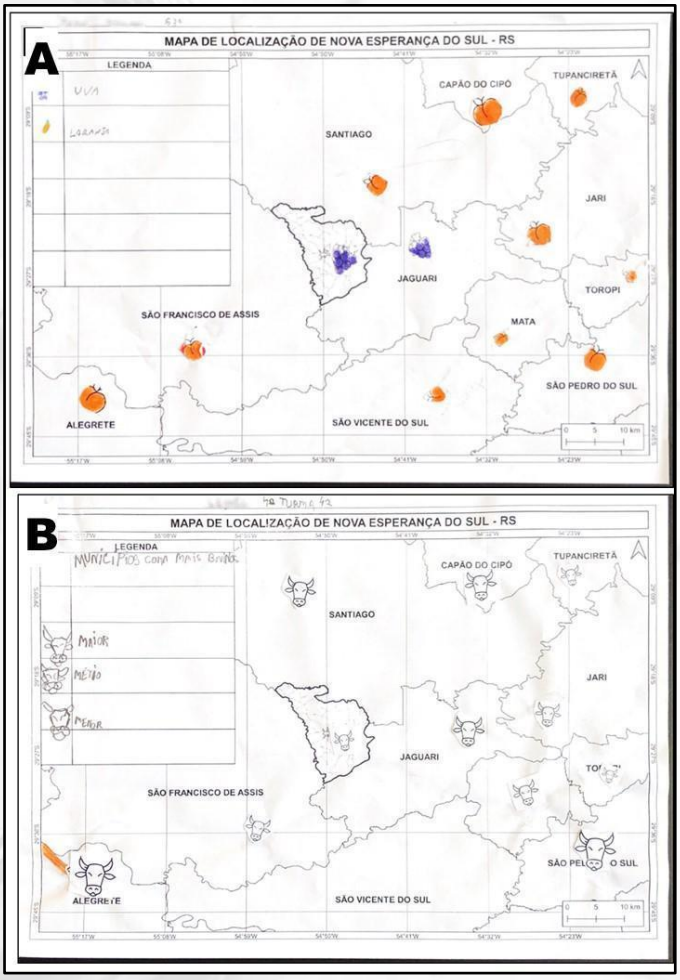
5.4 Nature of data and visual variables: how to represent?

It should be noted that the visual variables of shape, value, orientation, and granulation were not used, which could be associated with the fact that emojis already have specific colors and shapes, such as the yellow color and the rounded shape in the case of expressions. Camara et al. (2021) in their study reported the same situation, that due to the complexity of the symbols contained in emojis, they have several visual variables, which can cause changes in the interpretation of the map.

The qualitative data was the easiest to represent, using emojis referring, for example, to the type of livestock and crop. However, some difficulties were observed, as explained below. The participants used appropriate emojis to represent the data, for example, for the prevalence of grapes or oranges in the municipalities, but varied the size of the emojis for qualitative data, leading to errors in the representation (Figure 07 A).

Many students had difficulty representing the emojis associated with the quantitative data, so much so that it was necessary to include emojis with different sizes in the second application of the workshop, as already described. In many cases, the students understood the logic of using the visual variable size, even though the proportion was not correctly associated with the table (Figure 07 B).

Figure 07 – Maps handed in by students. A) The participant understood the idea of diversity in the data, even though they used emojis of different sizes; B) The legend demonstrates an understanding of the visual variable of size



Source: Organized by the Authors (2022).

Still, on the subject of quantitative data, one of the themes that caught the students' attention during the workshop was the representation of the number of cargo vehicles (trucks). Most of the students represented the quantitative data using emojis of expressions, that is, the existence of a greater number of cargo vehicles resulted in the use of an expression of happiness (Figure 08 A). However, there were two other ways of representing it. One student used the visual variation “size”, the technique of proportional symbols, and

modified the dimensions of a truck (Figure 08 B). Proportional symbol maps are those that best represent quantitative phenomena and are one of the most widely used methods for constructing maps with punctual implantation (Archela and Thery, 2008). Another student, using creativity, represented trucks by varying the number of axles to represent more or fewer vehicles in the municipalities (Figure 08 C).

Figure 08 – A) represents a map with the use of expression emojis; B) the student used the visual variable of size; C) the student varied the number of axles of the truck to associate the greater or lesser amount of cargo vehicles

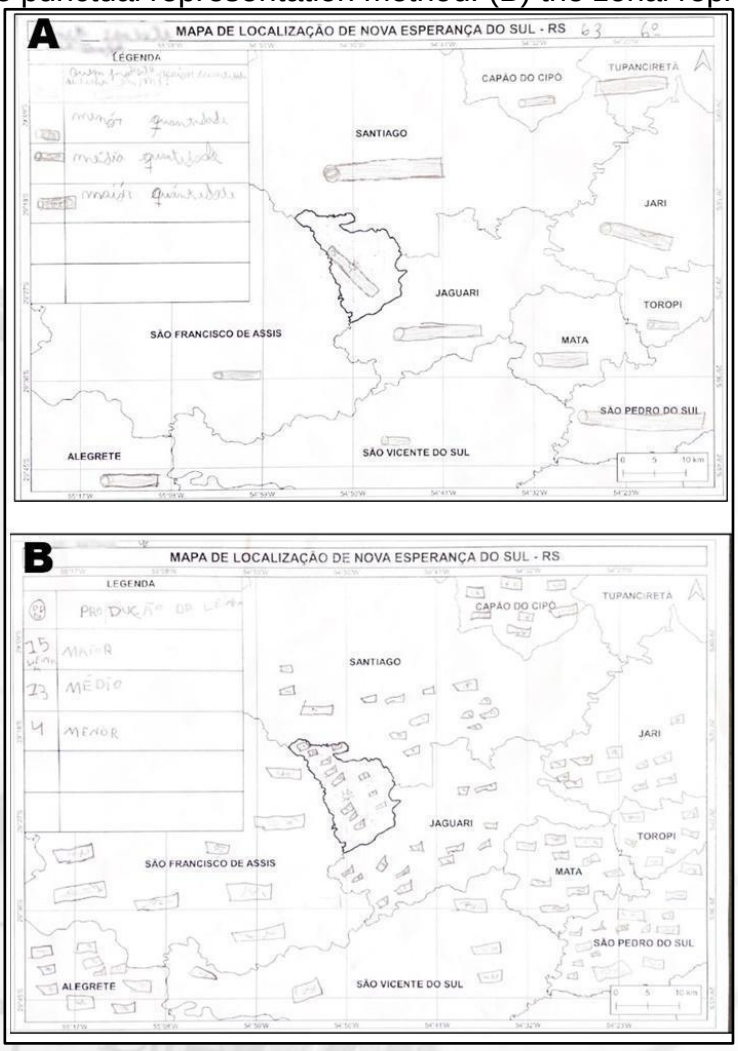
Source: Organized by the authors (2022).

As for the sorted data, the students used the visual variable size in the vast majority of cases. Archela and Thery (2008) pointed out that when quantitative information is sorted into classes, it is not appropriate to use the visual variable size, because there is no way of differentiating how much each point is worth within the established class. However, as these are variations from “largest to smallest”, the students' association is well-founded.

5.5 Punctual and zonal representation: Is the data in every municipality or not?

About the implementation mode, the vast majority of participants used the punctual format, with only two students using the zonal format. An example of different implementation modes for the same piece of information occurred with the “log of firewood”. One student, using his or her finger to measure, used the visual variable of size to represent the logs (Figure 09 A). Another student represented the data zonally, by placing many or few logs of the same size in each municipality (Figure 09 B).

Figure 09 – (A) the punctual representation method. (B) the zonal representation method



Source: Organized by the authors (2022).

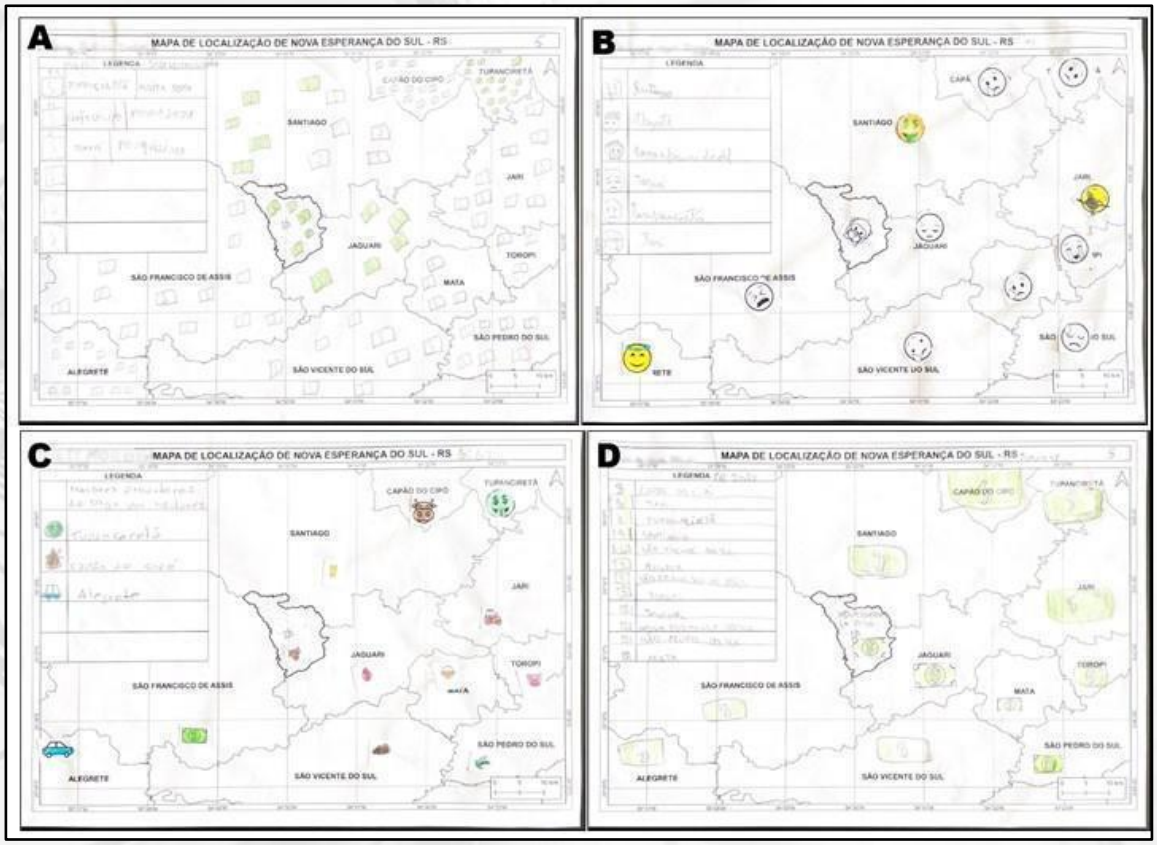
5.6 Emotional aspects: does soybean generate much money?

Many students associated emotional aspects with the mapping process, which can be seen in the fact that most of them used the facial expressions of emojis, even though the data could have been represented using the pictorial symbol. Many students mentioned the predominance of soybeans in the municipalities, and the representation of the production of this temporary crop caught the eye in several drawings.

To represent the soybean data, many students chose emojis of money notes (Figures 10 A and D), associating soybean production with significant profitability. Others explained that soy generates money to buy equipment (tractors and machinery in general) and animals (cows, sheep, and pigs) for their families (Figure 10 C). In this way, it can be seen that the participants associated the data with their reality, showing progress in the process of *Cartographic Literacy*.

One of the students represented the MHDI by an emoji using a facemask, in Jari (RS), which drew attention. This was because he associated the fact that a municipality with a low MHDI would possibly have a poor quality health system and a high occurrence of COVID-19 cases (Figure 10 B). It is also important to note that some participants placed a heart emoji in the municipalities where they lived, as a justification for liking the place. In this vein, some authors (Novak et al. 2015; Kaye et al. 2016; Fischer and Herbert, 2021) point out that the use of emojis can denote anger, happiness, or sadness, and some other relationships such as activities, places, objects of interest or social organizations.

Figure 10 – Mosaic of maps handed in by the students. (A) and (D) soybean production. (C) it refer to the income obtained from the soybean harvest. (B) municipality's low MHDI



Source: Organized by the authors (2022).

When representing emotions on maps, it can shed light on the different relationships and feelings that individuals develop with certain places (Caquard and Griffin, 2019). As such, mapping through the use of emojis is a way of expressing oneself and communicating, different from the oral and written form that we are used to in contemporary society. We currently have access to many technologies and resources, which can be used to understand spatial reality.

Lastly, in terms of the feedback given by the students, most of them found it easier to interpret qualitative data. As for quantitative data, it was noted that they were able to interpret the data tables and point out which municipalities had the highest or lowest amount of each of them, despite having some difficulties with representation.

As for the comments left by the participants after the activities, most pointed out that they had never used emojis in the classroom. Some pointed out that “it was not like a lesson, that it was fun” and that “they would like to participate in this type of practice again”. They mentioned that they had never made maps, so the activity encouraged the teaching of Geography and Cartography more lightly.

6 FINAL CONSIDERATIONS

The methodological adaptation, which was made in response to some problems that occurred during the first workshop in Jari (RS), effectively solved most of the inconsistencies, especially regarding the exchange of tables between the students, as well as the lack of interpretation of the data. The inclusion of emojis with different sizes proved to be fundamental in improving the understanding of the data provided by the majority of participants. Although some were unable to progress to the stage of accurately representing the data and drawing up the legend, there was a logical understanding of the data.

When it comes to cartographic content, the practice of copying maps or traditional map painting is commonly observed, with no link to the place or connection to data interpretation. In this sense, the proposed methodology has helped to foster the role of the map-making student, also promoting Cartographic Literacy and *Cartographic Literacy*. However, there is one exception: in future applications of the workshop, cartographic notions should be worked on more intensively, before the representation of thematic data, using emojis.

The emoji approach came closer to the reality of the students, either because of their familiarity with these everyday elements on social networks, or due to their exploration of the study of place. In this way, it was observed that the use of emojis provided the development of reading skills and the ability to create representations, in a fun way, and mobilized different emotions that would not have been perceived using traditional Thematic Cartography methodologies.

In light of the varied possibilities for analysis based on the methodology of using emojis to represent thematic data, future directions are wide-ranging. Given this, it is

possible to explore more methods of evaluating the workshop, such as applying individual questionnaires to the students, which could provide a more detailed understanding of the impact of the proposed methodology. Alternatively, a comparative analysis with other teaching approaches could assess the relative effectiveness and specific benefits of using emojis in School Cartography.

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