

Perception, awareness, and appreciation of the territory through TikTok: A lesson for Basic Education

Percepción, conocimiento y valoración del territorio a través de TikTok: Una herramienta para la Educación Básica

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DOI: 10.35429/JBE.2023.18.7.17.25

Received November 10, 2023; Accepted December 30, 2023

Abstract

In this research, a questionnaire was administered to 129 individuals in three secondary schools in the Altos Sur region of the State of Jalisco, aiming to diagnose the students' environmental perception, as there is no evidence of similar studies in the region. The results highlight that adolescents are sensitive to environmental issues and exhibit a predisposition towards altruism, gender equality, socio-environmental equality, as well as their relationship with other living beings. They also provide an overview of their career and academic aspirations upon completion of their current studies. Some of the surveyed students used the diagnostic results to create videos shared through the social media platform TikTok, in order to provide information about the environmental situation in the region and promote the formation of values.

Environmental Education, Perception, TikTok

Resumen

En esta investigación se aplicó un cuestionario a 129 personas en tres escuelas secundarias de la región Altos Sur del Estado de Jalisco, con la finalidad de realizar un diagnóstico de la percepción ambiental de los estudiantes, debido a que no hay evidencia de estudios similares en la región. En los resultados se destaca que los adolescentes son sensibles ante las problemáticas ambientales, y presentan una actitud proclive hacia el altruismo, la igualdad de género y de condiciones socioambientales, así como de relación con otros seres vivos, y brindan una semblanza de las aspiraciones laborales y académicas al término de sus estudios actuales. Algunos de los estudiantes encuestados se basaron en los resultados del diagnóstico para la creación de videos que compartieron a través de la red social TikTok, para brindar la información sobre la situación ambiental de la región e impulsar la formación de valores.

Educación Ambiental, Percepción, TikTok

Citation: MARTÍNEZ-OROZCO, Flavio & CARBAJAL-MARISCAL, Oscar. Perception, awareness, and appreciation of the territory through TikTok: A lesson for Basic Education. *Journal Basic Education*. 2023. 7-18: 17-25

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Introduction**Environmental Diagnosis of the Municipality of Arandas, Jalisco**

One of the economic activities in the State of Jalisco, and particularly in the municipality of Arandas, is the production of tequila from the *Agave tequilana* var. *Weber* species, which has increasingly positioned itself in international markets after the denomination of origin of this crop was established. To get an idea of the importance of this industry, in 1995 a total of 104.3 million litres of tequila were produced and in 2019 production rose to 351.7 million litres (Consejo Regulador del Tequila, 2020), which represents an increase of 337 % in a span of 24 years. This growing agricultural activity has displaced the region's traditional grassland ecosystems, which still make up 25.1% of the territory, and it is anticipated that this trend will continue due to the high demand for agave.

The grassland ecosystem, despite having few tree and shrub species, is of great ecological importance as it contributes to climate regulation, aquifer recharge and cleansing, pollination, invasive species control and carbon sequestration. It is also attributed cultural, recreational and even spiritual value (CONABIO, 2019). Agave monoculture requires an average of 7 years to be harvested, therefore, it does not allow the proliferation of other organisms as it is maintained with herbicides and weed removal, so the natural balance has been fractured and could be defined as a predatory relationship.

The change in land use, which now covers 61.7% of the municipal territory used for agriculture, has caused the disappearance of some animal species (coyotes, sparrow hawks, wildcats, among others) and plant species characteristic of the grassland ecosystem; in conjunction with this activity, there is also an upward trend in livestock production, which extends the impact inherent to this practice, given the need for more land for its production (CONABIO, 2019).

There is a study conducted by INEGI dating from 2014 called: "Information on the generation, composition and management of solid waste originating from domestic and commercial activities in the localities".

Within this, the municipality of Arandas is among the 17 municipalities that produce the largest amount of solid waste in the State of Jalisco, totalling more than 70 tonnes per day, of which only 6% is recycled; this is an indicator of the absence of sustainable strategies and responsible consumption by the population and producers who could make changes in their lifestyles and systems of manufacturing goods.

According to the municipal environmental index, Arandas is in the "very low" category, ranking 122nd at the state level (IEEG, 2019). This index takes into account important aspects such as solid waste generation, deforestation, exploitation of aquifers, forest cover, existence and care of protected natural areas, among others.

The large number of tequila factories in the municipality produces a significant amount of waste, most of which is vinasse, which together with industrial waste contaminates 10 litres of water for every litre of tequila produced; most of this waste is discharged into the Lerma Santiago river, causing a high degree of disruption to the aquatic ecosystem, causing problems for the environment and the health of the municipality's population (El Informador, 2009).

Diagnosis of the society, culture and economy of the municipality of Arandas**Demographics**

The municipality of Arandas belongs to the Altos Sur Region, its population in 2020 was 80,609 people, of which 51.01 per cent were women and 48.99 per cent men (INEGI, 2020); of the total municipal population, the majority is concentrated in the city centre, with 74 per cent of inhabitants (IEEG, 2023).

Migration

Like many municipalities in the State of Jalisco, which is considered or characterised by a migratory tradition, there is a degree of migratory intensity to the United States with a value of Low, determined by the percentage of homes that receive remittances, the number of homes with emigrants in the United States of America as well as circular emigrants (IEEG, 2023).

Poverty

During 2020, the population in moderate poverty was 31 per cent. The highest deprivation with 65.3 per cent was access to social security (IIEG, 2023).

Economy

Arandas is characterised as a municipality with agricultural activity and during the last few years it has positioned itself as the 12th municipality at the state level within INEGI's National Statistical Directory of Economic Units (IIEG, 2023). The composition of enterprises in the municipality is 46.9 per cent dedicated to commerce, 41.22 per cent to services, 9.86 per cent to manufacturing industry. On the other hand, the value of agricultural production in 2021 was 3.41 per cent of the state total, and livestock production has remained constant and growing, for the same year it represented 4.75 per cent of the total state production.

Culture

At the cultural level the municipality and the region are characterised by their values and high sense of identity which, according to Serrano-López (2017) these characteristics were consolidated over the years in part due to the relative isolation of the community and its strong Spanish heritage.

This isolation underwent a radical change when influenced by the current economic development model and globalisation, which led to an opening up of the Arandense culture and even the social dynamics to change, for example, not only is it characterised by the decreasing migration of its members to other parts of the country or abroad, but it is now common to receive migrants from other states, most of whom work as day labourers.

Job prospects in the region for young people

Durand (2014) conducted a relevant study on the decline of Mexico-US migration, specifically in the Arandan scenario, where he highlights that the generation from 1990 onwards stopped moving due to the costly and problematic nature of undocumented migration, resulting in greater labour competition in the region and a rise in agricultural activities such as day labourer or mediero work, for which they must compete with immigrants from other states, which made such work even cheaper.

In the same research, Durand highlights that recent generations of young people with higher academic degrees aspire to integrate into the tequila industry, whether in factories or in farms and specialised agricultural production, which allows them access to benefits and credits, such as the means to acquire their own housing. It is important to mention the role of women in the economy, who went from being housewives to being active in industry or in the agricultural sector.

In the bibliographic search, no previous diagnosis was found regarding the population's perception of environmental problems in the municipality, nor on the valuation of the territory or knowledge of it, nor on the existing opportunities and limitations from a cultural-ecosystemic point of view.

Although it is a recent practice in our biogeographical environment, it is important to try to understand and structure the biological history of the region, in order to have an overview of what has been the connection and relationship between the environment and society and how nature determines some of the characteristics. Quoting Olvera (2019): "Environmental history contributes to the urgent change that society-nature relations require in order to mitigate the civilisational crisis we are experiencing".

Environmental perception is defined as part of the psychological process that is developed and established between the individual and the natural environment, for which a research tool must be designed to consider this relationship in the context to be carried out (Garcia, 2006).

Through a study of this nature it will be possible to establish the differences in the environmental perception of secondary school students and teachers, to evaluate the level of commitment, values and appreciation of local environmental issues, and to evaluate the level of commitment, values and appreciation of local environmental issues.

Nowadays, given the scope and nature of social networks, as well as the predilection of recent generations for multimedia content, audiovisual material is an excellent interpretative medium. According to the research carried out by Gruber (2001), it was concluded that the use of audiovisuals is a very good solution in contexts where communication processes are complicated, especially when dealing with large groups. In order to reap the benefits of this communication, it is necessary to reformulate a new pedagogy that is capable of integrating the different socio-environmental dimensions and interactions.

According to M. Stoicescu et al. (2018), the availability of various educational materials has boosted social services, attracting the academic environment to provide correct, applicable and constantly updated knowledge. The development of core capacities, which include: planning, self-control, flexibility and generating awareness, are developed from the age of three, and continue to develop from the age of 15 to 23 (Holmstrand, 2016), so it is of paramount importance to have a far-reaching impact on the way this group interprets reality.

For this project, the research questions were posed:

1. What is the current view of young people on the environment and environmental problems present in the locality?
2. What characteristics should the production process of a participatory audiovisual material with adolescents have in order to facilitate an educational-environmental process that contributes to the reformulation of the ecological-cultural perception of their locality?

For its part, the general objective established the elaboration of an educational audiovisual material that contemplates the formation and reformulation of the ecological-cultural perception of students of basic education, secondary level in the municipality of Arandas, Jalisco in the period before and during the confinement due to the COVID-19 pandemic, based on the valuation of the territory from a cultural-ecosystemic point of view, as well as the valuation and perspective of the biological-cultural history of the region.

Development

Method and methodological approach

Although the aim is to create an audiovisual material in a participatory manner with and for secondary school students in the municipality of Arandas, a research tool with a qualitative and quantitative approach was developed in order to collect the necessary inputs for the creation of such material, therefore several categories were made, which were divided into:

- Knowledge about the local environment and its relationship with the current society, as well as such interaction throughout the biological history in the region.
- Pro-environmental scale. It includes items based on the definitions of Corral-Verdugo et al. (2004), seeking to measure the willingness and application of actions that protect the environment and its impact individually and as a group, which serves as a parameter to establish how important the environment is nowadays for secondary school students, what actions are already taken to care for the environment, as well as the willingness to change habits in order to minimise impacts.
- Models to which young people aspire in the municipality and the environmental implications in the short and long term, taking into account the history of the main economic activities in the region, as well as their impact on the environment.

The second stage or conformation of the audiovisual material, had a qualitative approach, since according to Hernández-Sampieri (2014), in the particular case of the students, in conjunction with their environment and the influence of the current system of basic education in secondary school, feeds or favours a vision of the world, as well as to interpret the events that occur in this, we tried to understand it according to that context, it was taken into account that given the conditions with the isolation due to the pandemic of COVID-19, much of the educational weight had migrated to the family environment, creating a different context of study.

Research instrument

A mixed questionnaire of closed and open-ended questions, which were assessed using a Likert-type scale including items based on the scale of Corral-Verdugo et al. (2004), was administered to a total of 129 individuals. Of the total sample, 80 were female and 49 were male, grouped according to their school grade: 8 first graders, 43 second graders, 71 third graders, three teachers and two secondary school graduates.

Some items with open-ended questions were also included, adapting several of the ideas present in the Training European Teachers for Sustainable Development and Intercultural Sensitivity (TETSDAIS) project. This programme used open-ended questions to try to elicit information without influencing students, as Zohrabi (2013) points out, "using open-ended questions can lead to a higher level of discovery".

The values obtained from the application of the research instrument formed the basis for the organisation of the videos that were produced and shared through the social network TikTok.

For the elaboration of the audiovisual material, the diagnosis was shared with teachers, school authorities and secondary school students, in order to evaluate and specify the structure and contents of the documentary video, enriching the information with current data in the municipality in the environmental and sustainable field.

Characteristics of the research instrument

The diagnostic tool was divided into the following parameters:

1. Personal information and level of education.
2. Knowledge about the local environment and its relation to the current society.

The results obtained were used as a guideline for decision-making regarding the contents to be included in the narrative of the audiovisual material.

– Altruism.

This parameter gathered information from the interviewees' self-analysis of their behaviour and willingness to help others.

– Pro-ecological behaviour.

Considered as actions and activities that contribute to the conservation, care and improvement of the environment.

– Austerity.

Involves behaviours and lifestyles that are characterised by reduced or measured consumption, avoiding unnecessary expenses.

– Equality.

These domains are part of the pro-environmental scale, which measured the willingness and application of actions that protect the environment and its impact individually and as a group.

– Models to which young people aspire in the municipality and the short and long term environmental implications.

– Participation in the development of audiovisual material.

This area measured and established participatory working groups of students and teachers with direct and indirect input to the audiovisual material that was shared on the social network TikTok.

The survey was applied through Google forms.

Methodology for the application of the research tool

The research tool was applied to a total of 129 individuals from 3 schools. Of the total sample, 80 were female and 49 were male. Three teachers and two secondary school leavers also participated in the exercise.

Results

Knowledge about the local environment and its relationship with today's society.

In response to the question: What are the most important natural resources of the Altos de Jalisco? 29% of the respondents identified these riches as agave, maize and bean crops (Table 1).

Domestic fauna (Cows, Chickens, sheep...)	Crops (Agave, corn, beans)	Precious stones	Local fauna (coyote, vulture, deer, wildcat...)	Local flora (Huizache, ash, cactus...)	Ecosystem (Grassland/shrubland)	Forest	Riquezas de otra región.
17%	29%	9%	14%	6%	1%	3%	15%

Table 1

To the question: What are the problems that threaten or degrade these natural resources? 42% of respondents identified pollution as the predominant factor (Table 2).

Climate change	Deforestation / Logging.	Pollution	Hunting	Fires	crops	Chemicals	Humanos
9%	16%	42%	9%	5%	5%	5%	9%

Table 2

To the question: How much are these problems related to what people (population) do or don't do? 62% of the respondents answered that they are very much related to human activities (Table 3).

Very much / Closely related	Related	Not much / Not closely related	It is not	Nothing related
62%	29%	5%	2%	1%

Table 3

To the question: If altruism is a selfless behaviour to help others, what altruistic behaviours do you think you have practised lately? 35% of respondents answered that they have given away money, clothes or groceries (Table 4).

Helping family	Helping the elderly	Helping strangers	Giving clothes, money, food	Care animals, water, plants	No / none
9%	7%	26%	35%	6%	8%

Table 4

For their part, 45% of the respondents answered that they have helped without expecting anything in return to improve the environment in their locality (Table 5).

Yes	Yes, not littering	Yes, collecting rubbish	Yes, preventing others from littering	Yes, reducing the use of plastics	Yes, reducing water consumption	Community projects	No
45%	18%	16%	3	4%	2%	8%	8%

Table 5

On pro-ecological behaviour, more than 50% of the people surveyed:

- Look for ways to reuse things, before throwing them away and replacing them with new ones.
- Try to save energy at home (by switching off lights, using energy-saving bulbs or buying energy-saving appliances).
- Try to consume mainly seasonal and locally produced food (to avoid excessive consumption due to transport) (Table 6).

Field	Strongly disagree	Disagree	Neither agree nor disagree	Agreed	Totally agree
Behaviour					
You look for ways to reuse things, before throwing them away and replacing them with new ones.	8	8	18	35	60
You try to save energy at home (by switching off lights, using energy-saving bulbs or buying energy-saving appliances).	7	5	20	32	65
You try to consume mainly seasonal and locally produced food (to avoid excessive consumption due to transport).	6	5	24	31	63

Table 6

In terms of equality, more than 75% of the respondents were of the opinion that:

1. Men and women have equal rights to development, the same as humans and non-humans (plants and animals).
2. Poor and rich have the same rights to access to water and to live in a dignified and joyful environment.
3. A person has the same value regardless of their origin or physical appearance / just as you think your locality is just as important as a jungle. (Table 7).

Field	Strongly disagree	Disagree	Neither agree nor disagree	Agreed.	I fully agree
Equality					
For you, men and women have the same rights to development, as do humans and non-humans (plants and animals).	3	1	10	16	99
You believe that rich and poor have the same rights to access water and to live in a dignified and joyful environment.	1	6	4	7	111
For you, a person has the same value regardless of his or her origin or physical appearance / just as you think that your locality is as important as a jungle.	4	3	4	13	105

Table 7

Regarding the role models students aspire to, more than 50% of the respondents were of the opinion that:

- They plan to study and prepare themselves to get a good job in a local company or job.
- There are alternatives to industry and agriculture that help us protect the environment.
- They could be part of the change needed to take care of the environment in the municipality. (Table 8).

Field	Strongly disagree	Disagree	Neither agree nor disagree	Agreed.	I fully agree
Aspirational role models					
You plan to study and prepare yourself to get a good job in a local company or job.	4	2	12	12	99
You believe that there are opportunities for everyone in the municipality, if they have the necessary skills.	8	8	24	27	62
You believe that there are alternatives to industry and agriculture that will help us protect the environment.	4	2	10	36	77
You could be part of the necessary change to take care of the environment in the municipality.	6	2	13	34	74

Table 8

50% of the people surveyed expressed interest in participating in the production of a video documentary on the history and current environmental issues in the municipality. In response to this population, two online courses were given in 2021 and advice was provided so that students would have the knowledge and develop the skills to write scripts for audiovisual media, as well as the handling of the camera and the theory of the composition of the images in the video.

Audiovisual production

The students made a total of nine videos that were uploaded to the social network TikTok. It was decided to create a user profile on the TikTok social network that would have its own identity, similar to the channels on Google's YouTube social network, that would not be related to a particular user and whose content would be dedicated to education and scientific dissemination, with an emphasis on the care and knowledge of the environment. It was then that the logo was designed and the name "Tlaloc code" (<https://bit.ly/47jwkn8>) was created for this user profile, alluding to the Aztec deity dedicated to the phenomenon of rain, which is at the centre of ecosystems and whose dynamics are interdependent.

Acknowledgement

This project did not receive any funding.

Conclusions

The people surveyed expressed the causes of current environmental deterioration, such as pollution, industry, livestock farming and other anthropogenic activities. On the other hand, there was a lack of knowledge about the natural environment, its history and its values, which has a bearing on the current crisis in the region. In terms of audiovisual production, the response from the students was modest, but some students and a former student were able to make their own style in the videos they made. A total of nine titles have been visited by various users on the platform www.tiktok.com.

The present project served scientifically as an initial environmental diagnosis that included several dimensions and laid the foundations for further regional studies; at the social level, an impact was generated by personalising the audiovisual production process in which the students collaborated.

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