

Article

Twitter as a tool for citizen education and sustainable cities after COVID-19

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Abstract: The social confinement resulting from the COVID-19 crisis temporarily reduced greenhouse gas emissions. Although experts consider that the decrease in pollution rates was not drastic, some surveys detect a growth in social concern about the climate. In this new climate-conscious environment, municipalities and local governments are promoting a new way of living and caring for cities, even before they can regain national and international freedom of movement. This work analyzes the connection between the new climate awareness arising from the COVID-19 crisis, the proposals of sustainable citizenship around the world, and its communication on Twitter to educate the new eco-conscious audience. The methodology mixes quantitative and qualitative analysis, using the Twitonomy Premium tool and the Twitter research tool, with data extracted at the end of December 2020. Among the top 10 most influential and active accounts, the results show educational institutions, local institutions, companies, neighborhood, associations, and influencers. The impossibility of living the city, has not prevented citizen education and commitment to make real change for when that city and its citizens return to normality. Although this new normality must be different: more ecological, more responsible, more sustainable and practiced from early childhood.

Keywords: COVID-19; Twitter; sustainable cities; sustainable citizenship; environmental awareness; responsible consumption; sustainable tourism.

1. Introduction

In December 2019, a hitherto unknown type of coronavirus [1], named SARS-CoV-2, caused a severe respiratory illness in Mainland China. The virus transmission went from a single area to the entire country in 30 days [2,3,4]. Two months later, after its rapid expansion, the disease began to be called by the scientific community as COVID-19 (an acronym for Coronavirus Disease 19). Throughout 2020, dozens of countries around the world experienced numerous outbreaks, as no effective drugs [5,6] or vaccines were developed. The main factors that contributed to its expansion were the population's high international mobility, and the high population density in urban areas [7,8,9,10].

Preventive strategies, in addition to hygienic ones, included measures of social distancing, community confinement, reduced mobility, and perimeter closures of hundreds of cities [11,12,13]. This social confinement temporarily reduced greenhouse gas emissions. In Spain, the BC3 (Basque Center for Climate Change) and the Observatory for Energy Transition and Climate Action (OETA) predicted that 2020 would close with a historic decrease in these emissions. They estimated a fall of 15%, the largest decrease since 1990 and the year in which these calculations were inaugurated [14]. According to the same study, and according to monthly measurements, in the first months of 2020, the reduction in emissions was due to the decrease in activity of coal-fired power plants [14].

This decline was on the rise, in April and May, as social distancing and home confinement measures tightened.

The data is reproduced in a similar way when studying the phenomenon at the European level, although experts consider that the decrease in pollution rates was not so drastic. The Global Carbon Project (GCP) of the World Meteorological Organization (WMO), in its November 2020 newsletter, estimated that in the most intense period of forced confinement, reductions in carbon dioxide (CO₂) could fall as much as 17%, in relation to the 2019 data [15]. However, it predicted that the total annual reduction would only be between 4.2% and 7.5%. The best data for the environment came from the level readings of large cities' centers: Helsinki, Florence, Heraklion, Pesaro, London, Basel and Berlin [16]. However, the WMO recommends caution and explains that the high natural atmospheric variability of CO₂ requires more numerous measurements and in more time, since a lower concentration of carbon dioxide is not always linked to a lower presence of fossil fuels.

Until the data are published later, numerous studies and surveys do detect an increase in social concern about the climate as a result of the crisis and confinement. The deadly coronavirus called into question the welfare state and encouraged the world's population to think about climate change more seriously. Keesing et al. [17] already warned of the unbreakable nexus between the climate emergency and the transmission of infectious diseases, a decade before the COVID-19 crisis. They noted that the decline in biodiversity reduced the capacity of essential ecosystem services, the defenses of humans, animals, and plants, and consequently, the increase in infectious diseases [17]. This study called for the need for socio-climatic awareness so that areas of high natural biodiversity serve as a reserve for pathogens that do not have to come into contact, for example, with humans [17]. Currently, this work accumulates 23,000 downloads on the website of the prestigious journal *Nature*, and more than 854 quotations in publications around the world.

The WMO submitted another report in May 2020, which also openly stated that climate change is deadlier than coronavirus because it includes ocean warming, record sea levels, melting ice sheets, storms and droughts, and proliferation of still unknown pathogens [18]. Likewise, the Convention on Biological Diversity (CBD) of the United Nations (UN) underlined in its report Global Biodiversity Outlook (GBO-5), in August 2020, the need to meet the 20 Goals of Aichi. According to the text, biodiversity is key to all factors of human life, including health [19].

Numerous international media have shown the results and proposals of these studies. Climate awareness has expanded its visibility and importance on the media agenda. And polls from various organizations include questions on these issues, even focusing on areas that were used to be unrelated to climate. The European Investment Bank (EIB), the community financial body of the European Union, published in January 2021, the 2020-2021 EIB Climate Survey. The results reveal that COVID-19 has influenced the perception of citizens about the climate emergency; and climate and ecological recovery are high on the EU agenda [20]. Specifically, the survey shows that 57% of European citizens affirm that the economic recovery after the global pandemic must consider the climate emergency and that European governments must promote an urgent reduction of CO₂ [20]. According to the same survey, citizens of some European countries, such as Hungary (71%), Malta (67%), Spain (64%), Germany (63%), Luxembourg (63%) and France (61%), think that the fight against climate change should be part of the economic recovery [20].

In this new climate-conscious environment, town halls and local governments promote a new way of living and caring for cities; even before recovering national and international freedom of movement. Although the concept of sustainable citizenship is not new, the current situation has caused its regeneration. Butler [21] explained that the term was born from the *Brundtland Report* of United Nations, also known as *Our Common*

Future [22]. From there it evolved to combine the care of the human environment and the physical environment [21].

The coronavirus crisis has increased the importance of social responsibility in the way of living, knowing and relating to the city [23,24,25,26,27,28], the promotion of national and international tourism with sustainable perspectives [29,30,31] and the need to take care of cities, their public spaces, buildings and monuments [32,33,34,35]. The empowerment of the youngest in schools has been worked in recent international research to achieve more sustainable cities in conflict areas [36]. In a similar way, Lee [33] has worked with young people from Hong Kong, to learn their definitions of sustainable consumption and how they take care of their way of consuming and living to end social inequalities. This eco-conscious consumption includes traveling less by plane and using less polluting public transport, a topic that Cole also investigates [37], relating sustainable citizenship with political voting and Brexit. In his research, tourism appears as a source of income to be exploited after the country leaves the European Union. However, promoting it would contradict the British government's zero-emissions promise [37].

Until people from all over the world can move freely through their cities and confirm that COVID-19 has made them more responsible and sustainable citizens, city councils and local governments promote a new way of living, caring and relating to cities. Regional institutions promote their cities, their streets, their gardens and their attractions, dreaming of the day when their own citizens or potential visitors can re-live them freely. However, aware of environmental concerns, ecosystem data, and the role of human beings in preventing future pandemics, they propose to return to these cities experiencing them in a different way. The main way to do this is through social networks [38, 39, 40, 41, 42, 43], which exponentially increased the number of users during the mandatory confinement [44]. At the beginning of 2020, more than 4.500 million people used the Internet in the world and 3.800 million were social media users. This meant that 60% of the world's population regularly accessed the digital world and 45% of the same population also was on social media [45].

According to other international reports, the digital population spends 6 hours and 43 minutes connected every day [45] and at least half of that time runs from a mobile phone. Social media users spent an average of 2 hours and 24 minutes a day browsing and interacting with their profiles, which represents more than a third of all the time they dedicate to the digital world [45]. The social networks chosen were, in descending order: Facebook, with more than 2,111 million users; YouTube, with more than 1.900 million users; Instagram, with more than 1,000 million users; and Twitter, with more than 340 million users [45].

According to the social context and the theoretical precedents discussed, this work proposes an original, unpublished and necessary investigation that discovers and analyzes the connection between the new climate awareness arising from the COVID-19 crisis, the proposals of sustainable citizenship around the world, and its communication on Twitter to educate the new eco-conscious audience. This primary objective includes the following secondary objectives:

- Analyze the state of the matter in academic publications and the most current and prestigious research on social networks for sustainable citizenship education.
- Detect, geolocate and analyze proposals on Twitter that educate citizens about care and sustainable development of their cities, using the Twitonomy Premium tool, with data extracted at the end of 2020.
- Compute and analyze, based on the accounts detected, those with the most users and the most influence.
- Analyze and comment in a mixed, qualitative and quantitative way, how is their activity in the social network, from their original tweets with the hashtag #SustainableCity. The quantitative analysis will consider total tweets, tweets per day, retweets, followers and hashtags. The qualitative

analysis will consider the relation or reasons of the quantitative data, the most named destinations or tourist attractions in recent weeks, and the most original and eco-conscious proposals for the chosen period: January-December 2020.

To operationalize the general and secondary objective, the following Hypothesis 1–4 were proposed:

- **Hypothesis (H1).** COVID-19 has awakened and increased a virtual civic awareness of the citizens, who follow accounts that educate and promote sustainable citizenship on social media, even months before being able to recover mobility.
- **Hypothesis (H2).** This awareness of sustainable citizenship is promoted by official entities, which must fulfill their environmental commitments.
- **Hypothesis (H3).** Sustainable citizenship offers a reinvention of the way of living the city, revising places, public spaces, monuments and buildings or proposing destinations with a new awareness.
- **Hypothesis (H4).** It is impossible to corroborate whether this sustainable citizenship awareness will actually translate into more sustainable cities when the socio-health crisis is over, although Twitter now offers an eco-conscious education and perhaps escapist and cathartic call, showing cities that we cannot walk freely but we can care and do dream about.

2. Materials and Methods

This work analyzes the connection between the new climate awareness arising from the COVID-19 crisis, the proposals of sustainable citizenship around the world, and its communication on Twitter to educate the new eco-conscious audience, quantitatively and qualitatively, using the Twitonomy Premium tool, with data extracted at the end of December 2020. The chosen social media has been Twitter because it allows you to view tweets without having to be registered as a user. Likewise, Twitter is considered the social network where governments, politicians and institutions are most present [46,47,48,49,50,51,52,53,54]. Considering the reports of the introduction and underlining that the ecological commitment and sustainable education must come from governments, institutions and companies [55,56,57,58,59,60,61,62,63,64], the social media for microblogging was chosen as the most adequate to meet the objectives of the study.

Twitonomy is a web application to analyze the social network Twitter, exclusively. It is used to make publications and to analyze tweets, hashtags, followers, impressions, engagement rate and top domains. It is owned by Diginomy Pty Ltd, an Australian company headquartered in New South Wales. Its use policies include that its users are over 16 years old, human and not systems or bots, and if they opt for the Premium version of payment, that they provide a full name and a valid email address [60]. It is not affiliated with Twitter Inc., or any of its brands, and its features and functionalities are independent of the social network.

The data offered in each search is provided by Twitter's API (Application Programming Interface) and is subject to its limits [65]. Analyzing the general policies and guidelines, directly on the Twitter website, the social network explains that its APIs provide companies, developers and users with programmatic access to their data, with the exception of non-public information or direct messages [66] which implies a necessary compliance with the required ethical standards [67,68,69] and proposes a radical re-reading of traditional journalism as a primary source of information [70,71,72,73].

The analyzed hashtag is #SustainableCity, which includes all its forms in uppercase and lowercase: #Sustainablecity, #sustainableCity and #sustainablecity. When using the Premium version or paid subscription, Twitonomy allows monitoring up to a full year and dates were entered for the interval “since: 2021-01-01” and “until: 2021-12-31”. Likewise, the last 3,000 tweets of the first 9 days of the year 2021 were analyzed in detail, as the tool offers, to confirm that there were no inconsistencies. Finally, another manual

scan was made on Twitter, directly in the search box, for the same dates. The results were recorded and one by one compared with the ones obtained in Twitonomy, and the analysis was articulated from the two processes mixed. Only the accounts that used the hashtag, #SustainableCity, and the rest of the post or description in English were counted.

3. Results

When searching for the hashtag #SustainableCity, the Twitonomy Premium app offers numerous results. In the left column of results it provides: flow of tweets per day, most influential users, most engaging users, most active users, top hashtags, top languages and locations on a map. In the right column of results it provides: most retweeted tweets and most favorite tweets, in reverse chronological order, from present to back. Taking into account the main objective of the study, the results that allow a solid, realistic and deductive portrait have been chosen.

3.1. Most influential users & most active users

According to Twitonomy, the most influential users are the users or accounts with the most followers; the most engaging users are the users or accounts that gained the most favorites using the selected hashtag; and the most active users are the users or accounts that most mentioned the selected tweet in original tweets, since they do not count retweets, as they are not original content. To meet the proposed objectives, the 5 Twitter accounts that used the hashtag #SustainableCity and that have the most influence (more users) and the 5 Twitter accounts that used the hashtag #SustainableCity and that were most active (used the hashtag more times). They are shown in Table 1.

Table 1. Users and Twitter accounts that stood out the most with the hashtag #SustainableCity.

| Most influential users & most active users | Tweets | Following | Followers | Listed |
|--|---------|-----------|-----------|--------|
| @dirkjanjanssen | 17,324 | 986 | 113,559 | 376 |
| @weincludedorg | 34,273 | 3 | 2,025 | 30 |
| @Sustain_City | 2,008 | 408 | 1,438 | 51 |
| @aberdeenCF | 676 | 73 | 632 | 24 |
| @labiks_lab | 167 | 286 | 244 | 0 |
| @imagine_garden | 218,903 | 931 | 4,532 | 41 |
| @imaginecities | 3,716 | 220 | 519 | 96 |
| @DaanV72 | 1,990 | 331 | 170 | 0 |
| @MissNRush | 1,353 | 793 | 496 | 8 |
| @les_kidz | 225 | 321 | 142 | 0 |

¹ Source: Self-made from the data obtained in Twitonomy and Twitter.

Among the 10 accounts with the most influence and activity, we find educational institutions (@Sustain_City, @les_kidz), local organizations, companies (@labiks_lab, @imaginecities), neighborhood associations (@aberdeenCF), non-governmental organizations (@weincludedorg, @imagine_garden) and influencers (@dirkjanjanssen, @DaanV72, @MissNRush). Their activity, in number of tweets, is very uneven, between 167 and 218,903. Likewise, the range of followers is very wide, between 142 only and 113,559. Another interesting point, very representative, are the Twitter lists. This tool allows a user to create a list of accounts that interest him so that only the tweets of the accounts that he has decided to include in that list appear in it. It is another way to measure engagement and it is interesting to see that @dirkjanjanssen (an influencer) would be the

most included in lists. On the contrary, @labiks_lab, @DaanV72 and @les_kidz are not on any list.

3.2. Tweets, retweets, hashtags and retweeted tweets activity

Table 1 provides some very interesting quantitative data for the intended objective, but taking advantage of the features of Twitonomy, the data related to the specific activity of each account was also recorded. It is very interesting to relate the visibility of the account with the work that is carried out by the user or owner of that account; or the effort that is dedicated from each account to achieve their visibility and engagement. These results are shown in Table 2.

Table 2. Users and accounts with their activity in tweets and hashtags.

| Most influential users & most active users | Tweets per day | Retweets | Hashtags | Tweets retweeted |
|---|-----------------------|-----------------|-----------------|-------------------------|
| @dirkjanjanssen | 8.13 | 2% | 9 | 28.91% |
| @weincludedorg | 132.79 | 97% | 0 | 100% |
| @Sustain_City | 0.43 | 46% | 1.04 | 32.69% |
| @aberdeenCF | 0.16 | 43% | 0.08 | 33.9% |
| @labiks_lab | 0.16 | 32% | 1.16 | 28.14% |
| @imagine_garden | 0.17 | 98% | 3.14 | 22.30% |
| @imaginecities | 0.67 | 17% | 2.12 | 20.24% |
| @DaanV72 | 4.92 | 15% | 0.44 | 6.50% |
| @MissNRush | 1.48 | 34% | 0.54 | 10.15% |
| @les_kidz | 0.31 | 22% | 0.67 | 16.1% |

¹ Source: Self-made from the data obtained in Twitonomy and Twitter.

After selecting the 10 accounts with the most influence and activity, the research analyzed, one by one, the activity of each of those accounts. The Twitonomy tool offers a very complete profile analytics: tweet analytic, tweet history, users most re-tweeted, users most replied to, users most mentioned, hashtags most used, tweets most retweeted, tweets most favorited, days of the week, hours of the day (UTC), platforms most tweeted from, tweets, followers, following, favorites, lists following and lists is following. To meet the objectives of the research, it has been considered that the most representative data are those that appear in Table 2:

- Tweets per day: Average number of tweets posted every day.
- Retweets: Percentage of retweets in the total of analyzed tweets.
- Hashtags: Average number of hashtags per tweet.
- Tweets retweeted: Proportion of the user's tweets retweeted by others.

The tweets per day section shows a wide range, between 0.16 and 132.79 tweets per day. This data is remarkably interesting, as it shows profuse activity, especially from non-governmental organisations (@weincludedorg) and influencers (@dirkjanjanssen, @DaanV72, @MissNRush). It must be remembered that the validity of this data is based on the fact that the number of tweets per day arises from the selected period and not from the entire age of the account, since in that second case, the data would not be comparable between accounts that can have very different life spans.

Retweets are another interesting point, in this research and in any other work on Twitter. Remember that the Twitonomy screening excludes posts where the hashtag has been retweeted. That is, it stores and analyzes the original tweets in which the chosen

hashtag has been used. However, it does allow you to know how many times that original tweet was retweeted by other accounts, as will be seen later. In this case, the data refers to the non-original publications that each account made, which were retweets, but in all their activity, not only referring to the hashtag #SustainableCity. This data allows viewing the interaction of the accounts with other users of the social network and is the part of the investigation where the results are more even, because a profuse activity in retweets is observed. This includes @imagine_garden, with 98% of its publications with retweets that come from original tweets of other users; @weincludedorg, with 97% of retweets; @Sustain_City, with 46% of retweets; and @aberdeenCF, with 43%. This activity, in the sustainable citizenship education, is quite common because accounts can retweet publications of citizens who are visiting or have visited them.

The hashtags section provides the number of tweets used by each of the accounts in their publications. The average number of hashtags is very similar, in all cases, and almost all accounts use only one hashtag or less, thus giving it all the prominence. Some accounts have an average hashtag per tweet below zero and this is an interesting circumstance, since the absence of hashtags can worsen the visibility of the tweet and the account; but this would not have happened in all these cases.

3.3. Five proposals to educate in sustainable citizenship

After the quantitative analysis of the two previous subsections, a mixed analysis of the content of the accounts was necessary. Its variety, age and origin are quite different, as already mentioned, and that makes it necessary to know the specific educational proposals of each account to make cities more sustainable, as shown in Table 3.

Table 3. Five proposals to educate in sustainable citizenship

| Most influential users & most active users | Five proposals to educate in sustainable citizenship |
|--|---|
| @dirkjanjanssen | Riding a bicycle, wearing a helmet when riding a bicycle, promoting walking, encouraging the use of the train instead of the car, pedestrianizing downtowns of cities. |
| @weincludedorg | Use electricity from solar panels, reduce water waste, use eco-friendly printers, wear recycled polyester clothing, use bamboo toothbrushes. |
| @Sustain_City | Eating sustainably, not to flush wipes, not using plastic swabs, traveling by bicycle, encouraging girls to study science careers. |
| @aberdeenCF | Promote more lanes for cyclists, increase the distances between bicycles and cars, do not use the car on short trips, promote more paths for walking and running, do not litter the road. |
| @labiks_lab | Promote the use of shared bicycles, promote more lanes for cyclists, ride a bicycles with adequate equipment, ride a bicycle using a mask and hydroalcoholic gel, promote sports to reduce overweight, diabetes and hypertension. |
| @imagine_garden | Reduce the use of pesticides, take care of endangered species, promote tree planting, promote plants in homes, promote gray water recycling. |
| @imaginecities | Promote neighborhood associations, build greenhouses, use clean energy, promote fair wages, reduce construction on the waterfront. |
| @DaanV72 | Promote bike lanes, reduce car use for individual com- |

| | |
|------------|---|
| | muters, promote affordable public transportation, promote short journeys by foot, increase the width of sidewalks for pedestrians. |
| @MissNRush | Promote teleworking, promote quality online teaching, raise awareness about water consumption, fight for quality education worldwide, empower students to reduce inequalities. |
| @les_kidz | Reduce the use of plastics, promote urban gardens, educate on sustainability from early childhood, make children aware of endangered species, reduce water waste, consume non-packaged fruits and vegetables. |

¹ Source: Self-made from the data obtained in Twitonomy and Twitter.

The education proposals for sustainable citizenship are numerous and varied. The common link is clear and blunt: climate change is possible from small individual changes, in each home and in each citizen. These changes must exist, be shared and promoted, along with public and community proposals. Reading in depth each one of the tweets, this message is repeated almost every time and sustainable education contains small and simple gestures: reducing water waste, using public transport or walking short routes, using shared transport, reduce the use of plastic products, or educate on sustainability from early childhood. This last point constitutes one of the key findings of the research and shows Twitter as a useful and diverse space for citizens to train in sustainable citizenship, at all levels and actions.

4. Discussion and conclusions

The previous results, according to the objectives of the research, must be commented and discussed in depth, from the perspective of the authors to the state of the art and the previously exposed working hypotheses.

Hypothesis (H1). *COVID-19 has awakened and increased a virtual civic awareness of the citizens, who follow accounts that educate and promote sustainable citizenship on social media, even months before being able to recover mobility.* Climate awareness is one of the concerns that has grown the most after the SARS-CoV-2 social and health crisis [14,15,16,17,18]. Although it was already on the political agenda of governments and parties, it is now also on the social and citizen agenda, as revealed by commented international polls [19,20]. It is confirmed that sustainable citizenship awareness is a top concern and as the media share the results of reports and surveys, they get the audience interested and expand their data and knowledge on the matter in social networks [22,23,24].

The decision to search for this information in social media can respond to the exponential growth of these during confinement. Although they were already an important part of our lives, the prohibition of physical socialization promoted the increase of virtual communication through social networks. In future research it would be interesting to see if there are more reasons to choose social media as a source of information on sustainable citizenship, for example: training of municipalities and local organizations to educate citizens on sustainable citizenship, promotion of recycling in neighborhoods and cities, itineraries of bicycle routes, car-sharing initiatives, urban gardens in buildings, schools and gardens, sale of second-hand products hand, promotion of the circular economy, trick of products and services in neighborhoods, proposals to sale perishable products at low prices to avoid their waste... Likewise, it would be very suggestive to interrelate the presence of a hashtag on social networks with searches for the same term in search engines, as allowed by the Google Trends tool.

Hypothesis (H2). *This awareness of sustainable citizenship is promoted by official entities, which must fulfill their environmental commitments.* The analysis of the hashtag #SustainableCity has corroborated this hypothesis, although it has shown that the accounts with the most influence and activity are also individual and personal accounts. According to

the commented authors, Twitter is the social network most chosen by official entities, local governments, political parties or politicians in office [46,47,48,49,50,51,52]. The research data confirm that the most active accounts in sustainable citizenship are of this nature and maintain the validity and timeliness of these previous research [23,24,25].

Specifically, @Sustain_City highlighted the sustainable initiative of the City University of London, which according to its description, is located in the heart of London and committed to academic excellence. In addition to this commitment, it shows another great commitment to making London a sustainable city, with the help of its students. It is one of the most successful accounts, with more than 31,100 followers and its account is more than a decade old, since it joined Twitter in June 2009. Interesting research could focus on comparing this initiative with others from other universities, the country or other continents. Its activity is very profuse, with more than 10,100 tweets at the end of this investigation and its proposals for the education of its students in environmental commitment are numerous and laudable.

It is true, as has been raised in the research that it is necessary to distinguish between more influential accounts and more active accounts. Influence is usually measured in the number of followers and official entities have an easier time scoring points in this regard; while an influencer or individual person must win each follower, one by one, for the content they offer. It would be interesting, in subsequent research, to filter the search for activity on Twitter only to European countries, to analyze and compare which would be the most active and responsible in social media; and compare their proposals with those of countries that stand out in each of the other continents.

Hypothesis (H3). *Sustainable citizenship offers a reinvention of the way of living the city, revising places, public spaces, monuments and buildings or proposing destinations with a new awareness.* The state of the matter outlined high-impact academic works, with experiences in the five continents and the proposal of many ways to educate citizens in making cities more sustainable [28,29,30,31,32,33,34,35,36]. In the same way, it showed responsible sustainable education campaigns, on social networks and outside of them [23,30,36,38]. These investigations were considered to elaborate this hypothesis, which stood as one of the fundamental preconceptions to make a mixed analysis that included the qualitative. The hypothesis has been corroborated with the five proposals to educate in sustainable citizenship, listed in Table 3. Based on these results, future research could focus exclusively on analyzing the Twitter accounts of a city, searching and analyzing neighborhood accounts and proposals, comparing them according to their nature: public, community or private initiative. It would be important to detect if these cities are more underlined by official entities (governments, parties, municipalities), by companies, by influencers, by education institutions [60,61,62,63], or by citizens who live in these cities and want to share their sustainable proposals with the rest of the world [34,35,36,51]. Other investigations could focus on studying in depth the proposals that have been promoted by the citizenship and that after reaching noise in social networks, have gone on to become a public or official action. Activism promotes, in part, these initiatives, as has been commented in the theoretical framework [47,48,49,50,51,59], and it would be interesting to focus a study on art education, intervening in the city in a sustainable way.

Hypothesis (H4). *It is impossible to corroborate whether this sustainable citizenship awareness will actually translate into more sustainable cities when the socio-health crisis is over, although Twitter now offers an eco-conscious education and perhaps escapist and cathartic call, showing cities that we cannot walk freely but we can care and do dream about.* As mentioned, surveys on problems that concern European and international society, of course, contemplate climate awareness and education in climate awareness [20,22]. This includes, in some studies, a promise or anticipation of being more aware and sustainable citizens when it is possible to live the city again. When the desired group immunity has been achieved, the virus is overcome, and freedom of movement regained, studies will have to assess whether that awareness has been translated into reality or was only promises; and how long that awareness lasts, whether it is temporary or long-lasting.

Unfortunately, there are still many months to go before these studies can be done. Meanwhile, this research has corroborated the hypothesis, showing Twitter as a citizen education tool for sustainable cities after COVID-19. And it is due to the number of accounts, the number of users, their activity, the engagement they achieve and the internationalization of the proposals. The impossibility of living the city has not stopped citizenship education and the commitment to real changes, when the city and its citizens return to normal. Although this new normal must be different: greener, more responsible, more sustainable and from early childhood. From this it is proposed that future research compare the activity of the most influential accounts, contrasting their activity on Twitter, YouTube, Facebook, Instagram and TikTok, to detect successes and errors, similarities and differences, or the best exploited and most chosen networks by the audience. Likewise, it would be interesting to conduct surveys or focus groups with students, followers of these accounts, to find out which groups choose one social network over another and why, when raising awareness about sustainable citizenship.

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