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Insights from the relationship between urban form, social media, and edu-tourism

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ABSTRACT
Educational tourism and urban spaces are complex and interwoven phenomena of the contemporary globalized world. The extended windows of time that students of higher education institutes spend in the host cities makes them more than mere visitors; they become part of the everyday life of the urban context. Nevertheless, the interdisciplinary relationship between urban studies and edu-tourism remains understudied in contemporary literature, especially considering emerging types of data that can provide new insights. This paper draws on volunteered geographic information to explore interactions between higher education students and their host cities. Geotagged Twitter data was analysed in terms of both spatial density and content. The study was conducted in two coastal cities of Cyprus. The analysis indicates tendencies for student interactions with spaces outside the university campuses—with the majority of tweets associated with non-educational interaction types and venues with diverse spatial signatures. This study argues that edu-tourism is largely associated with urban tourism and it is essential to consider these interactions in decision-making and urban planning to improve both the tourism industry and the urban spaces.

Introduction

Cities and the tourism industry are intertwined phenomena of the modern world, constantly influencing one another for better or for worse (Aiesha & Evans, 2007; Bouchon & Rauscher, 2019). Expanding the interdisciplinary connection between urban studies and tourism would not only improve cities but will help to create a more humanistic and sustainable tourism industry. However, the relationship between the two fields has not fully been explored and more research is required (Dupre, 2019). This is particularly important because the everyday life of contemporary cities cannot be segregated easily from its interactions with visitors (Ashworth & Page, 2011). The tourism industry has the potential to transform urban forms and vice versa (Gospodini, 2001; Xie & Gu, 2015). This mutual relationship can be specifically seen in cases of educational tourism (edu-tourism) since the target group has the capacity to form meaningful interactions with the context and can maintain the interactions for an extended period. Exploring the existing literature exposes very limited interdisciplinary studies that address the relationship between urban studies and edu-tourism.

Cities are highly complex entities that consist of numerous interconnected layers interacting at different scales (Carmona et al., 2012; Neal, 2012). These layers might be of various natures such as social (Gottdiener et al., 2019), spatial (Oliveira, 2016), socio-spatial (Hillier & Hanson, 1984),

economic, or political (Stewart, 1999), to name a few. Moreover, there are highly influential emerging layers, such as social media, that need to be integrated into the existing discourse (Gulnerman et al., 2020; Haffner, 2018). The current study is an attempt to explore the dynamism of the relationships between edu-tourists (students) of higher education institutes and their associated urban contexts. The study has two important contributions to the literature. First, it offers a multidisciplinary approach to the interface between urban studies and edu-tourism by using voluntarily shared, geo-tagged social media data. Second, it explores the potential influences of large-scale edu-tourism on small host cities. The study uses geotagged Twitter data, which was collected over the course of two years, to explore students' patterns of interaction with urban space.

Educational tourism and host cities

Travel and relocation to acquire knowledge, accreditations, or skills is not a new phenomenon; however, the expansion of this type of tourism and its intense impact on the host societies forces it into central contemporary discourse. Today, global expansion of the higher-education industry and overall economic growth has provided many youth with opportunities to continue their education abroad (ICEF, 2017).

Edu-tourism is a complex topic that requires more thorough investigations (Eluwole et al., 2020; Ritchie et al., 2003). Many dimensions of educational tourism are understudied (Lam et al., 2011). This is particularly evident in the lack of research crossing over between urban design studies and educational tourism even though higher education institutes greatly change their urban surroundings to accommodate a large temporary population (Iranmanesh et al., 2021). Accordingly, the future sustainable growth of edu-tourism must consider the local context as a key factor (Alipour et al., 2020). Tourism and education are both large and expanding industries that greatly impact their contexts in various ways (Matahir & Tang, 2017).

The benefits of edu-tourism for the host community are not a decisive discourse; however, the deep impact that this type of tourism has on urban settings—for better or worse—is undeniable (Wiewel & Perry, 2015). This might occur through a process that Smith (2004) calls *studentification* —students impacting the economic, social, cultural, and environmental dimensions of their host cities. Therefore, it is critically important to have comprehensive research that investigates these issues (Ritchie et al., 2003). It has been argued that edu-tourism has positive impacts on the local economy (Antiado et al., 2016); although, some negative long-term economic disadvantages have been reported (Matahir & Tang, 2017). Urban tourists who search for authentic city-life experiences might cause negative impacts to local residents' lives by gradually changing the structure of land use and the housing market as these try to cope with demand for touristic venues and holiday flats (Füller & Michel, 2014). Similar trends can be seen in cities hosting large higher education institutes (Revington et al., 2020; Rousmaniere, 2021) and edu-tourists. Locals might gradually move out of neighbourhoods in close proximity to campuses (Revington & August, 2019). Counter to these negative impacts, tourism also can increase local development—although, how beneficial this may be for local communities (Tomasi et al., 2020) or how consistently benefits can be applied across different regions are a source of debate (Tang, 2021). Correspondingly, the presence of a large student population can transform urban forms at different scales.

The scales and intensities of educational tourism vary from *informal*—learning while travelling in which all tourism might be considered educational (Smith & Jenner, 1997)—to *formal*—purposeful learning of students who travel abroad temporarily to attend educational institutes (Ritchie et al., 2003). This paper focuses on the latter form of educational tourism in relation to urban settings. This form of tourism generally places students in the local setting for a longer period of time than informal edu-tourism does, and it requires that individuals become integrated with the local setting.

Urban tourism can be defined as the overlap between the exploration of sense of place and experiencing the diversity and uniqueness of everyday life in a city. It is not merely sightseeing, nor is it merely leisure; it is an urban experience (Ashworth, 2009). This definition also fits the way

students of higher education institutes interact with host urban areas. They do not remain mere visitors but become temporary participants in the context.

The extended period of residency for higher education (e.g. 4 years for undergraduate studies) positions it outside some definitions of traditional tourism (Libreros, 1998) and educational tourism (Wang & Li, 2008). Nevertheless, medium-term residency for this purpose has been referred to as educational tourism in recent literature due to its temporary nature (Alipour et al., 2020; Hobbs, 2019; Kenfack & Öztüren, 2021; Tomasi et al., 2020). Moreover, edu-tourism envelops a wide range of touristic activities that are not strictly educational, such as cultural, environmental, urban, architectural, rural, and gastronomical activities (Ritchie et al., 2003; Tang, 2021).

Students of higher education institutes have a strong relationship with their urban surroundings. It can be argued that educational tourism is partly urban tourism, especially due to the close relationship between urban space and students' experiences (Wilkinson & Badwan, 2021). Hebbert (2018) argued that in cases in the United States where the campus and city are closely integrated, both city and students benefit more from the relationship compared to cases where the campus is separated from the city. The campus creates urban public spaces for the city and becomes a feature of broader urban tourism. Instances of this relationship have been reported in the USA (Gumprecht, 2007; Way, 2016), China (Cheng et al., 2020), Egypt (Ali & Kim, 2020), Australia (Goh & King, 2020), and Malta (Attard et al., 2021), to name a few. Throughout their educational careers, students at urban campuses experience, contribute to, and change the urban setting, albeit, incrementally. The urban area, concurrently, might transform to address the needs of the student population. In the United Kingdom for instance, a detailed study by Goddard and Vallance (2013) showed emerging possibilities regarding urban economy and development, community building, and sustainable approaches. Bilodeau et al. (2014) reported similar findings in Canada. However, Hubbard (2008) argued that the cost–benefit ratio of these possibilities is highly case-based and ambivalent (also see Enos & Morton, 2003).

Social media, urban space, and tourism

Social media is an emerging layer of data that can represent how people interact with the city (Sagl et al., 2012). This data is also referred to as volunteered geographic information (VGA) and has experienced rapid growth in its quantity, spread, research utilization, and real-world applications (Goodchild, 2007; Goodchild & Li, 2012). The data has shown promising results in rendering a detailed image of how people interact with the city (Iranmanesh & Atun, 2020a). Today's citizens almost invariably have access to mobile devices equipped with various sensors, and they can share data related to their everyday experiences if they choose to do so. The recorded metadata sometimes includes voluntarily shared geotagged information that ties the social media content to a certain location (Arribas-Bel, 2014).

Social media data has been utilized in addressing complex urban issues like social segregation (Shelton & Poorthuis, 2019), land use (Frias-Martinez & Frias-Martinez, 2014), mobility and behavioural patterns (Osorio-Arjona & García-Palomares, 2019), and urban hotspots and points of interest (Sun et al., 2016).

Tourism, in general, has been one of the industries most affected by the advent of social media (Gupta & Gupta, 2019). In terms of exploring urban space and tourism, Martí et al. (2021) argued that digital footprints (in the form of location-based social network data) have the potential to be utilized for identifying patterns of urban touristic behaviours and user preferences. Not only do tourists have access to new navigation tools, but they have the means to record and share their experiences (Alaei et al., 2019). Brandt et al. (2017) showed how geotagged Twitter data could provide a detailed understanding of the ways tourists interact with the city. Geotagged social media data can open a window into the patterns of behaviours among tourists, which can be used for constructive policy-making and planning (Vassakis et al., 2019). Furthermore, the data can provide a window into the users' everyday life experiences and interactions (Arribas-Bel, 2014; García-Palomares et al., 2018).

Therefore, it can be considered a viable medium for exploring the relationship between tourism and cities. Social media data usually has a strong temporal dimension that is very useful in conducting urban analysis (Li et al., 2013; Shelton, 2017). This is particularly important since temporal analyses are critical in tourism studies (Chhetri et al., 2010). Social media data—with its intrinsic speed, spread, accessibility, and associated metadata—can complement existing literature and traditional surveys, if used properly (Zivanovic et al., 2020). Therefore, incorporating this layer of data into multi-disciplinary studies could improve general understanding of the relationship between tourism and urban studies. This is especially critical as mobile devices increasingly become inseparable aspects of human experience (Fuchs, 2014), and new generations are using these devices in new ways (Ulubaş Hamurcu & Terzi, 2020). As such, studies that use this data to explore urban spaces seem to be useful in building frameworks for the future.

In this study, social media data (geotagged tweets) are presented as bridges between urban studies and edu-tourism. Both fields explore people's behaviours and their relationships and interactions with locations. In both fields, movement, accessibility, popularity, and sustainability are central topics. This study uses geotagged Twitter data as a means to address these relations in two case studies.

Case studies

Northern Cyprus has become a hub for higher education in the region for reasons beyond its diverse educational options; there are also socio-political characteristics, environmental conditions, and economic circumstances that attract people (Abubakar et al., 2014; Mehtap-Smadi & Hashemipour, 2011). On a global scale, international edu-tourists remain a very small proportion of the whole industry (Tang, 2021), but in places like Northern Cyprus, which are major higher-education destinations, the ratio is much higher (Alipour et al., 2020). The particular circumstances of Northern Cyprus have made it a major destination for edu-tourism (see Kenfack & Öztüren, 2021). Very little research has been carried out exploring the mutual effects of the tourism industry and the small-island urban environment (Nunkoo & Ramkissoon, 2010). The current study explores the relationship between two cities located in the northern part of Cyprus and their respective higher education institutes. The two institutes are located in two coastal cities: Famagusta (also known as Gazimağusa) and Girne (Kyrenia). The key differences between these cases are the relationships between the campuses and the host cities.

Eastern Mediterranean University (EMU) and its host city, Famagusta, were selected because the city is one of the most prominently oriented toward edu-tourism on the island, and its student population influences a major segment of the socio-economic structure of the city (Alipour et al., 2020). The EMU campus was originally situated outside the city, but limitations imposed on the city at its southern edge (a UN buffer zone) forced the city to expand north and incorporate the university campus (Iranmanesh et al., 2021; Önal et al., 1999).

Girne American University (GAU), located in Girne, was initially selected for control and comparison because it has approximately the same number of students as EMU. The region around Girne is a major recreational and touristic zone and the city has been transformed to accommodate the ever-growing tourism industry (Gunce, 2003; Vehbi & Doratli, 2010). In case of Girne (GAU), the university campus is a much smaller portion of the urban grid compared to Famagusta where EMU occupies a substantial portion of the urban spatial structure (see Figure 2).

Data collection

The study uses publicly available geotagged Twitter data to represent the range of movement and points of urban interactions of the students of the two universities. The Twitter data was collected using the NodeXL application, which is a network analytic toolkit (Ahmed & Lugovic, 2019; Hansen et al., 2010). The data was collected between January 2018 and January 2020. Any data collected

after January 2020 would be subject to the COVID-19 global pandemic and would require a unique enquiry in terms of theoretical framework and methodology (Iranmanesh & Atun, 2020b; Valizadeh & Iranmanesh, 2021); hence, more recent data is not included in the current study. Since students of the two higher education institutes are the target group of the study, the data was thoroughly controlled and filtered. The filtering process was performed in three steps and included the parameters of availability of regular geotagged tweets within the boundary of Northern Cyprus, the study timeframe, and student status of the Twitter users.

(1) The data collection process began by searching tweets for keywords that made them relevant to the context, such as Cyprus, Kibris, Famagusta, Gazimagusa, Girne, and Kyrenia., Naturally, there were people all around the world tweeting about places on the island (Figure 1: Left). From among over 1.2 million tweets, only 1,131 users had some available geotagged metadata and had tweeted from within the island, amounting to 363,872 tweets.
(2) From these users, all available tweets were collected that had intact geotagged metadata and were tweeted within the timeframe of the study (Figure 1: Right, 98,488 tweets).
(3) From this set of users, the students were separated by using both geographical and content controls. Users who had tweeted regularly from the dormitories or educational facilities were selected for the final target group (Figure 2). This process was done for each institute. The strict filtering criteria isolated 113 users to be used for the analysis. Then these users were separated into two groups according to their university affiliation. It must be noted that the study was not able to separate international students from domestic students, thus the final dataset includes both groups. However, the ratio of international students to domestic students is among the highest in the world, exceeding 75% (THE, 2022). Thus, it can be expected that the final target group would have a similar ratio.

Data analysis

The analysis started with looking at compiled data at a larger scale before deliberating the finer details that could be extracted from the geotagged Twitter data. A heat map (Kernel Density Estimation or KDE) was used to analyse the density of the data points for each student group (Iranmanesh et al., 2021; Silverman, 1986). The heat map provided a graphical representation of the density of the data points on a smooth gradient (Silverman, 1986; Wu et al., 2018).[1] Figure 3 shows the heat maps of the geotagged tweets for students of each university. Per university, the majority of tweets originated from the host city; nonetheless, user interactions in other cities were observed. Another interesting observation was the limited movement and tweeting of students across the UN buffer zone that divides the northern and southern parts of the island. Close examination showed that few students crossed the border or had limited geotagged interactions in the southern part of the island.
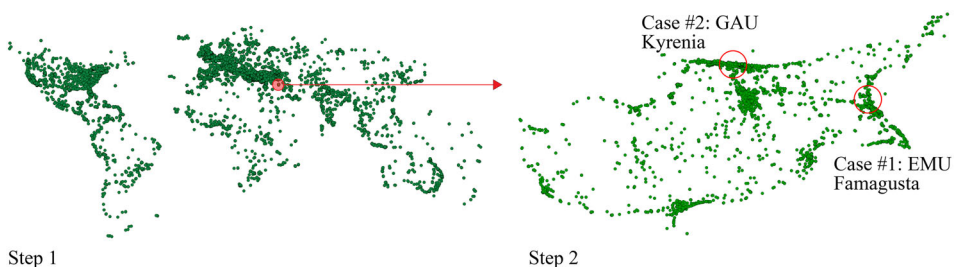

Figure 1. Steps 1 and 2 of data collection: tweets collected using keywords related to the context followed by location filtering.

Case #1: EMU, Located in Famagusta　　　　Case #2: GAU, Located in Girne

Figure 2. Geotagged tweets superimposed on the satellite imagery of the two cases, dots represent individual tweets.

The number of tweets associated with the four major cities in Northern Cyprus, which students of the two case studies can access, was further analysed. The results complemented the heat maps, showing the majority of tweets are associated with the host city of each university. The number is slightly higher for EMU because its campus is more integrated with the city than GAU is and offers a variety of internal commercial land uses. However, the number of tweets posted from other cities shows diversity in students' movements within the region. It could be argued that being a small island affects the proportion of internal travel. This became more evident when looking at tweets that are not connected to the urban areas. The category, *Other,* in Table 1 includes villages (Figure 4: a), natural parks (Figure 4: b), gated communities and hotel complexes outside urban areas (Figure 4: c), and marinas and beaches outside the city (Figure 4: d). In fact, the farthest

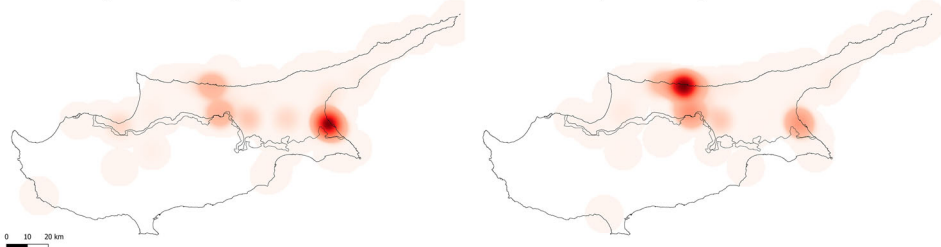Case #1: EMU, Located in Famagusta　　　　　　　Case #2: GAU, Located in Kyrenia

Figure 3. Heat maps of tweets by students grouped according to each university.

Table 1. The number of tweets associated with case studies, sorted by location.

		Total	Famagusta (Gazimağusa)	Nicosia (Lefkoşa)	Girne (Kyrenia)	Lefke	Other
Case #1	EMU	16,510	11,958	1,174	872	288	2,218
	Host city: Famagusta		72.5%	7.2%	5.3%	1.5%	13.5%
Case #2	GAU	14,096	1,747	2,062	8,996	119	1,172
	Host city: Girne		12.3%	14.6%	63.8%	0.9%	8.3%

(and most difficult to access) part of the island (Figure 4: b) was visited by 12 unique users (7 from EMU and 5 from GAU) during the study period – accounting for 10.6% of the target group. This demonstrates that the effects of educational tourism are not limited to the campuses and their immediate surroundings. These observations indicate that edu-tourism has the potential to be utilized in favour of all aspects of tourism.

The study then looked closely at the data on the smaller scale of each city. The tweets coming from within the associated campus boundary were separated from the rest of the tweets according to the user's university affiliation (Table 2). The overall results show that the majority of tweets are tied to spaces outside the campuses. In these cases, the university administrations aim to make on-campus activities more interesting and vital (see Biddulph, 1999). This approach tries to capture more of the capital (such as economic, cultural, and social) generated by students' activities while also promoting the university's image (Blackwell et al., 2002; Bromley, 2006). Despite the advantages that on-campus living might provide (Pike, 2002; Thompson et al., 1993), this analysis suggests that students tend to explore their surroundings and participate in broader urban life (see Graham et al., 2018). It could also be argued that this off-campus activity might be associated with students finding the costs lower for housing and services off campus (Bromley, 2006).

The distribution patterns, however, are not alike when comparing the two campuses. The EMU campus shows more internal Twitter interactions than the GAU campus. Arguably, this is caused by the relationship between the city spatial network and campus for two potential reasons. First, the EMU campus offers many active internal commercial and recreational land uses, which tend to motivate students to spend more time on the campus. Second, the EMU campus is much more integrated with the urban spatial network, whereas GAU is much more segregated from the city centre and is not an integral part of the urban spatial network (Figure 5).

Furthermore, the study explored historic parts of both cities via their representation in the dataset. In this region, historic districts are commonplace with clusters of interesting urban functions and attractions for tourists, especially when accessible by pedestrians (Pearce, 2001). This characteristic is more evident in Girne where the historic quarter of the city is easily accessible by pedestrians and is used as a major pastime destination. The historic quarter is the vibrant hub of Girne, whereas the historic part of Famagusta is a walled city that is less integrated with the rest of the city and on the opposite edge of the city from the university. Beaches, hotels, and commercial and recreational amenities outside the campuses are highly visible through the geotagged Twitter data in both cases.
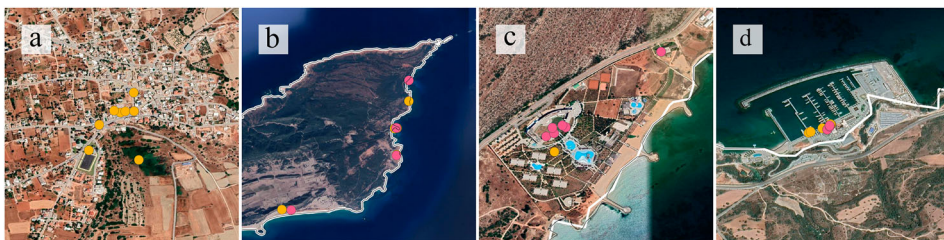

Figure 4. Examples of tweets in non-urban locations, superimposed on satellite imagery.

Table 2. Distribution of tweets inside and outside university campuses.

		Total in Host City	Inside Campus	Outside Campus/in Host City
Case #1	EMU	11,958	3,580	8,378
			29.9%	70.1%
Case #2	GAU	8,996	1,076	7,920
			11.9%	88.1%

Content analysis

The study further analysed the content of the Twitter data to gain insights into the different ways that people interact with the city. The Twitter content analysis can provide strong evidence for exploring social, spatial, and even temporal urban land-use distribution (Lansley & Longley, 2016). It has been effectively used for reading urban events (Jiao et al., 2018), touristic destination preferences (Garay, 2019), tourism marketing and capacity analysis (Bigné et al., 2019; Tiago et al., 2018), and smart tourism (Brandt et al., 2017).

　Here, the study used a keyword frequency search to explore the relationship between urban land use and students' interactions within the boundaries of each city. One of the challenges was language control. Since both institutes offer programmes in English and Turkish, the keyword search was performed in both languages. The process then classified each tweet into one of nine groups (Table 3) according to the intention of its content. The commercial group, which was the largest, was further separated into smaller sub-groups because different types of commercial activities might have different temporal patterns (Eldridge, 2019). For example, bars and clubs have more of a night-time signature when compared to cafes, shops, and food courts, which are more commonly daytime venues (Iranmanesh et al., 2021). The cleaning and processing of the data are essential steps in content analysis studies using Twitter data (Lansley & Longley, 2016). For instance, the keyword 'club' was used in instances such as 'sports club', 'dance club', and 'beach club'. In such instances, the tweets were checked manually and assigned to the correct groups. In cleaning data for content analysis, often two-letter English words are ignored, but in this case, a word like *ev*, Turkish for house, needed to be categorized. In this case, the narrow target group of the study made the close inspection of all tweets possible. Furthermore, since the target group was filtered and selected carefully, the content analysis did not encounter automated tweets (Twitter bots) or other irrelevant commercial tweets. Using the keyword search, the study was able to identify clearly the intentions of a large portion (GAU, 65.1%; EMU, 64.6%) of the group based on the content of their tweets.[2] The remaining tweets consisted of personal thoughts and casual tweets that could not be linked to a specific location via content analysis.[3] The data presented in Table 3
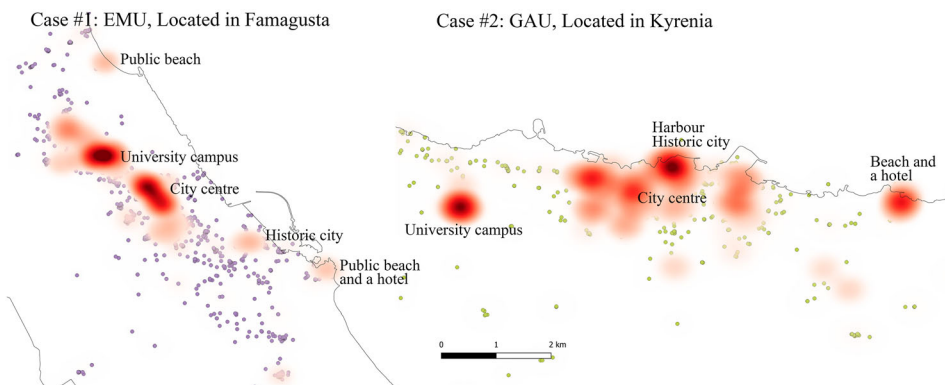

Figure 5. The heat maps of tweets for student users of each case study in their host city.

Table 3. Classification of tweets based on their content.

	All tweets with activities determined via the content	Commercial				Hotels and Related Amenities	Residences/ Dormitories	Education	Sports	Offices	Sites, Street Names	Health	Festivals, Concerts, Events
		Food and Coffee	Clubs and Bars	Shops	Services								
EMU	10,672	4092	1453	203	190	439	1120	1583	464	647	170	122	189
	64.6% of all	38.3%	13.6%	1.9%	1.8%	4.1%	10.5%	14.8%	4.3%	6.1%	1.6%	1.1%	1.8%
GAU	9,183	2505	1136	115	244	1730	984	1218	237	254	432	153	175
	65.1% of all	27.3%	12.4%	1.3%	2.7%	18.8%	10.7%	13.3%	2.6%	2.8%	4.7%	1.7%	1.9%

intends to show that in longer spans of residency—a natural by-product of edu-tourism linked to higher education—the scope of students' activities expands and affects various aspects of daily life.

Overall, education-related tweets were the second most frequent type. Tweets affiliated with commercial land use seem to be the dominant type; they make up around half of the identified tweets. Within the commercial type, food- and coffee-related tweets were the most frequent sub-types. Although the two case studies show similarities in most aspects, there is one key difference. Girne is a general tourist destination and is not primarily student-oriented; therefore, there are numerous hotels within the city. These establishments host many tourist-related amenities that also seem to be used by some students or there might be students working in such facilities. In Girne, 18.8% of tweets were affiliated with hotels compared to only 4.1% in Famagusta. The content analysis (Table 3) shows the possibility of identifying detailed activities of the target population. Tweets represent points of interest, therefore, this data analysis method can provide insights into land-use development and urban design by considering edu-tourism to be an influential layer.

Discussion and conclusion

Formal edu-tourism is not simply about learning; it covers a wide range of everyday life activities, as well as some touristic activities. Students, due to their extended periods of interaction with the host community, tend to develop stronger bonds than casual tourists do that make them contributors to the setting and not mere visitors. Moreover, edu-tourism has the potential to hybridize with eco-tourism, cultural tourism, rural tourism, gastronomic tourism (Siti & Mamat, 2019), and most importantly urban tourism. In this study, Twitter data was used to explore the extent of these activities and users' interactions with urban space in two cities. The volunteered geographic information found in tweets can serve as a bridge between urban studies (due to its geotagged metadata) and user preferences (due to the analysable content of the data) (Martí et al., 2021).

The spatial analysis showed that the majority of students' tweets were associated with the host city but not necessarily with the campus itself. Even though campus amenities were shown to be significant factors in student satisfaction and in attracting prospective students (Rahimizhian et al., 2020), this study showed a strong connection between the city and student life. This is critical because, for a long time, the self-contained campus idea tried to establish a clear separation between the campus and the host city (Hebbert, 2018). In the case of Famagusta and EMU, although the campus was not designed or placed intentionally to be a part of the city, the campus came to be in close contact with the city over time. Even the case of Girne and GAU has shown that when the campus is farther away from the city centre, the majority of student tweets still originated from the city centre. Therefore, future campus planning must consider the students to be an integral part of the host city.

This study has tried to show the existence and potential value of the association between edu-tourism and the development of urban space and urban tourism. Although the literature is comprehensive regarding higher education and host contexts in each discipline (urban studies and tourism), there seems to be a gap in multi-disciplinary studies where the two should be connected. In cities where institutes of higher education have a strong presence, the interaction between students (presented here as edu-tourists) and the city must be considered in planning and development. The importance of this study, therefore, lies in showing methodological means of connecting urban studies and tourism with the aim of providing insights into the different ways that edu-tourism destinations are changed by the student population. In general, urban tourists only experience a very limited portion of their destination city (Ashworth, 2009); the same cannot be said of urban tourism that is a bi-product of educational tourism. The broad extents of students' interactions with the city are influenced by the extent to which the student population affects and is affected by life in the host urban environment. Educational tourists, in general, have longer timespans to engage with the urban setting and have more focused motivation to explore deeply what it has to offer. As a result, they tend to become more a part of the host community than the average

urban tourist is, even though their stay is also labelled temporary compared to that of local residents. Accordingly, urban development must see these types of tourists as a cohort of the local urban population and not mere visitors. The findings of the study indicated a wide range of interactions within the two-year window of study for both cases. The diversity of activities that are not necessarily bound to the campus, and even the host city itself, reveals the potential extent of edu-tourism for the host nation.

Contemporary discourse in urban tourism (and edu-tourism, in this case) extends beyond location-oriented activities and events. It has become more and more about distinct urban activities that are integral parts of everyday life (Ashworth, 2009). Urban tourism might be perceived as a rigid phenomenon when it focuses only at ordinary or predetermined sightseeing. The relationship between city and tourism must progress beyond a juxtaposition of certain targeted activities and become a part of everyday urban life — not disturbing it, but accommodating it by bringing resources and opportunities to the local people. This approach seems to be more fitting with edu-tourism. Therefore, vitality and diversity, which are celebrated as quintessential in both urban and tourism studies (Jacobs, 1961; Rath, 2007), become generators of possibilities for integrated urban tourism (Romero-García et al., 2019). Likewise, edu-tourism has the potential to contribute to the diversity and vitality of urban form and must be considered in planning and design.

In terms of land use, it is essential to provide policies that encourage social, spatial, and temporal diversity in the placemaking processes of cities (Aiesha & Evans, 2007). Moreover, the intersection of residents' daily life and tourists' expectations needs to be addressed. This is especially important for edu-tourism in which the extended period of study creates the possibility of local residents feeling undermined by an overwhelming number of youth integrating into the host city. Sometimes, this phenomenon exposes itself most blatantly in the nightlife of the city (Eldridge, 2019). The Twitter content analysis suggested that more than 13% of all interactions occurred in outdoor, nightlife-related settings (i.e. bars, pubs, and clubs), and night-time interactions were third in prevalence for students after commercial- and education-related interactions. Eldridge (2019) study showed how nightlife might affect the senses of place, attachment, and belonging for local residents. Despite the fact that urban planners and designers explore opportunities to extend the temporal activeness of urban spaces, the impact that these might have on locals, even inspiring local resistance, must be a part of the discussions for urban land-use planning and development.

Another interesting observation related to the association between edu-tourism and the development of urban space was the formation process of both cities. In Famagusta, the EMU campus played a major role in the morphology of the city. The urban fabric grew toward the campus, creating linearity that connects the old and new parts of Famagusta. This axis is a major driver of commercial activities throughout the city. In Girne, the GAU campus is significantly isolated outside the city (as seen with the Twitter data) and has not been a major contributor to city form.

Limitations and future studies

The body of literature suggests that in some contexts, Twitter data might not be representative of the full spectrum of the population (Hargittai, 2018). Furthermore, only a very small fraction of tweets include publicly shared precise geographic data (Kumar et al., 2014; Vu et al., 2019). However, in this case, close inspection of the data and having selected a uniform target group (in terms of their student status) mitigated potential data sampling shortcomings. Since the study aimed to examine a well-defined target group who have high accessibility to the internet, the data can be considered an accurate sample. In addition, previous studies in this region showed the data to provide a reasonably clear image of urban activities (Iranmanesh et al., 2021; Iranmanesh & Atun, 2018). On the other hand, the study was limited by the inability to separate domestic from international students—an aspect that can be explored in future comparative studies.

Furthermore, this research was conducted in a small island nation; the same study might render different results in a larger place or on a mainland. The vulnerability of a smaller context in terms of

sustainability and cultural heritage must be considered for future planning and expansion of all forms of tourism (Akadiri et al., 2019; Alipour et al., 2020; Nunkoo & Ramkissoon, 2010). Recent studies have shown this to be the case in Cyprus, and proper long-term planning must take these issues into account (Debes & Alipour, 2011; Eluwole et al., 2020). Edu-tourism, as one of the major economic drivers of the region, must also be a part of the discourse.

Despite these limitations, the current study showed how utilization of the geotagged Twitter data could be used to explore the relationship between edu-tourism and urban space. Future studies can draw on the strengths of geotagged Twitter data, as demonstrated, to provide a more detailed analysis exploring the effects of edu-tourism on its social, cultural, and environmental sustainability. As shown in the content analysis, future studies might also focus on specifics of student preferences regarding local activities, cultures, and even cuisines. Ultimately, future studies might consider overlaying geotagged data generated by other types of tourists with that of students. This may be beneficial for policy-making and planning resilient cities to benefit the most from the tourism industry without compromising their social, environmental, and cultural heritage.

Notes

1. The heat map provides a gradient of density for point data. The heat map (KDE) was created using a specific bandwidth that defines the degree to which each data point will affect each pixel on the map. In the country-scale map (Figure 3), the diameter of 10 km was used, and for the more detailed urban analysis (Figure 5), 500 m was used to provide a more refined image (for instance see Brandt et al., 2017; Iranmanesh et al., 2021).
2. Percentages shown here represent the ratio of tweets that were identified using the content analysis (Table 3) to all tweets (Table 1).
3. Future studies might attempt to use a combination of content analysis and location data gathered from open Street map (OSM) to make better estimates.

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