TRANSFERRING STATE OF THE ART LBSN RESEARCH TO URBAN DESIGN AND ARCHITECTURE EDUCATION

L. Serrano-Estrada, T.J. Martin, A. Bernabeu-Bautista
University of Alicante

Session: LINKS BETWEEN EDUCATION AND RESEARCH
ICERI Sevilla, November 2019

Leticia Serrano-Estrada
PhD in Architecture
Orcid: 0000-0002-7466-1974
Researcher and Lecturer in the Urban Design and Regional Planning Unit,
Building Sciences and Urbanism Department
Email: leticia.serrano@ua.es

Tania Josephine Martin
PhD in Educational Research
Orcid: 0000-0003-1244-1201
Researcher and Lecturer
English Philology Department
Email: tania.martin@ua.es

Álvaro Bernabeu-Bautista
PhD Candidate in Architecture
Orcid: 0000-0002-2335-961X
Researcher Collaborator in the Urban Design and Regional Planning Unit,
Building Sciences and Urbanism Department
Email: alvaro.bautista@ua.es
MAIN OBJECTIVES OF THE STUDY

1. To investigate the transferability of methods to analyse the city that include Location Based Social Networks (LBSNs) from strictly a research activity among scholars to the urban design teaching-learning context by means of a collaborative learning activity in a controlled environment.

2. To evidence how the use of geolocated social networks enriches student understanding of city spaces that goes beyond their spatial characteristics.
2. RESEARCH QUESTIONS

RESEARCH QUESTIONS

RQ1: What types of inferences are urban design students able to draw from their analysis of the spatiotemporal data extracted from Twitter and Foursquare as a result of their interactions in a collaborative and controlled learning environment?

RQ2: How do LBSNs Twitter and Foursquare enrich student understanding of spatiotemporal patterns of data related to physical configuration; use, preferences and perception of urban spaces at a given point in time?
LBSN sources are rather useful to characterize city spaces based on:

- Preferences (Agryzkov et Al., 2016; Aliandu, 2015); and,

Most of these studies concur that data from LBSNs have the potential to offer a timely and complementary view of the urban physical environment.

Example of a dual method to study the public space. Left- Boston’s mental maps developed using traditional methods — Public map of Boston (Lynch, 1960)— and Right- Boston’s mental maps through contemporary methods —Right, Map developed using Instagram pictures (Yunjie Li, 2015).
3. THEORETICAL BACKGROUND. Collaborative Learning in Higher Education

- Collaborative learning activities are an important pedagogical strategy for addressing the changing nature of the university lecture as it adapts to the digital age, where vast amounts of knowledge in all fields is readily available to students online (Caldwell et al., 2013).

- The lectures need to be a motivating and inspiring space that encourages students to work in a collaborative learning environment, using all the resources available for learning as well as problem solving (Race, 2015).

- The scaffolding —materials provided for the activity as well as coaching and feedback— is usually provided by the teacher to facilitate independent learning once the necessary skills are acquired to approach future tasks of a similar nature. “tools, strategies, or guides that support students in gaining higher orders of understanding” (Devolder, van Braak, & Tondeur, 2012, p. 559) that would be impossible without guidance.

- The literature is scant when it comes to reporting specifically on the impact of using a collaborative learning activity built around the use of LBSNs research-based databases to better understand urban spaces among university students of urban design and urban planning.
Participants of the collaborative learning activity

- Two groups of students taught in English — 34 students — and Spanish — 25 students —, respectively.

- Enrolled in Urban Planning 2 — UP2 — for the 2018-2019 academic year, a compulsory subject taught in the first semester of the third year of the Fundamentals in Architecture Degree — FiAD — at the University of Alicante — UA — and the second of six compulsory modules that comprise the overall urban studies core program of the FiAD.

- Most UP2 students already have knowledge about the city’s overall components and functions as they have previously attended the UP1 module.
UP2 teaching content

- Provides students with skills relevant to the study of the urban public space, focusing on four key aspects: i) the physical configuration; ii) use, iii) preferences; and, iv) perception

- Students are actively engaged in interactive theoretical lectures and collaborative tasks, which aim to support two major guided assignments—urban public space: analysis and project—

- In both, the analysis and project phases, students are encouraged to use traditional—site visit, interviews, field observation—and contemporary—technologically-based sources such as social networks—methods and techniques
5. PROCEDURE AND MATERIALS

Collaborative learning activity: outline of the steps

Lecturers provided scaffolding to students in the form of: i) 8 hr. QGIS software program sessions, 2) introduction on how to pre-process, filter and extract information from Foursquare and Twitter raw datasets — —Excel and .cvs files—; iii) Online tools to create wordclouds and data graphics; v) Online tools for diagram creation and editing.

On the day of the activity (4h duration in a controlled environment)

1. Students were asked to fill in an initial questionnaire to collect data on the profile of students in terms of age, gender and how familiar they were with the case study city: Barcelona.
2. A handout was distributed, which explained the activity, objectives and tasks. The groups were given some time to read the handout and form pairs within their groups.
3. The students were provided with a web-link to download all the materials needed for the activity.
4. Once each group uploaded their diagrams and results at the end of the activity. Students were asked to fill in a follow-up questionnaire asking for their feedback on the activity.
5. The three researchers met over several sessions to analyse the materials uploaded and evaluate their content in relation to both research questions.
5. PROCEDURE AND MATERIALS

Materials provided

Each group was given access to the following material corresponding to the city of Barcelona as case study:

- Three Excel spreadsheets, one for each selected date, containing: geolocated tweets retrieved during three relevant Spanish national days, including the date and time they were tweeted; the tweet content; a list of the tweet languages; and, a list of hashtags.
- One spreadsheet with the Foursquare outdoors and recreation venues, ranked per number of visitors.
- One QGIS file with the four spreadsheets imported, containing georeferenced datasets of the Tweets and Foursquare venues, broken down into in the following layers:
  i. A layer representing tweets by time frame.
  ii. A layer with heat maps that visualizes the concentration of tweets.
  iii. A layer with the Foursquare Outdoors and recreation venues represented by the number of visitors.

ICERI 2019 - TRANSFERRING STATE OF THE ART LBSN RESEARCH TO URBAN DESIGN AND ARCHITECTURE EDUCATION
L. Serrano-Estrada, T.J. Martin, A. Bernabeu-Bautista. University of Alicante
Analysis of the work submitted

In response to RQ1, the inferences drawn from the collaborative analysis of spatiotemporal data extracted from Twitter and Foursquare, the findings can be grouped into three categories:

1. The significance of the day analysed;
2. What tweets reveal about the profile and temporal paths of people; and,
3. Key tweet topics in specific urban spaces at different times.
1. The significance of the day analysed

All teams in both groups discovered what was celebrated on the three days: 11th September, La Diada, Catalonia’s national holiday; 1st October, the first anniversary of the Catalan referendum; and 12th October, Spain’s national holiday —the Hispanidad holiday—. Most teams figured out this information by analysing the frequency of words and tweet hashtags for each day.

Exemplary diagrams elaborated by students

Visualization of most frequent hashtags and keywords
2. What tweets reveal about the profile and temporal paths of people.

By analysing tweet languages, students were able to differentiate user profiles. For instance, a distinction was made between locals —speaking Spanish and Catalan— and tourists —English and other languages—. Students linked these findings to spatiotemporal “traces” by generating timeframe visualizations.

Exemplary diagrams elaborated by students

Spatiotemporal visualization of tweets, predominant hashtags and tweet languages by day and location
3. Key tweet topics in specific urban spaces at different times

Most students used the visualization on a map to identify concentration of tweets using timeslots and they detected clusters of tweets in and around key urban landmarks.

Some groups created maps using exclusively the most relevant hashtags, which involved them pinpointing the most significant timeframe for people presence in specific urban spaces.

Exemplary diagrams elaborated by students

Visualization of tweet clusters and key tweet topics in specific urban spaces at different timeframes
Analysis of the work submitted

In response to RQ2, the students were able to understand spatiotemporal patterns in relation to use, preferences and perceptions of the key urban spaces. However, there was no reference made in the uploaded diagrams and results to the physical configuration of these urban spaces.

1. The use and preferences of urban spaces was inferred by analysing the “when” and “where” of tweet generation.

2. The cross-checking of data from Twitter against Foursquare provided guidelines as to the most checked-in and most tweeted from urban spaces.
Students were able to identify public spaces for protest routes from other spaces merely used for touristic leisure purposes.

Students inferred the user perception of the urban realm and the specific celebration date by the user activities that were revealed in the pictures sourced mostly from the Twitter database, some of them linking to Instagram images. Conflict, sadness, citizenship, rejection, were among the sentiments that were identified.

Other teams identified the perception of users from the tweet content. For instance, political stances in relation to pro-Hispanidad and pro-Catalunya independence were reported.

**Exemplary diagrams elaborated by students**
The results of the collaborative learning activity have demonstrated the transferability of LBSNs from strictly a research activity among scholars to the urban design teaching-learning context in higher education.

Arguably, the scaffolding provided the skills necessary to carry out the activity and to select, process and interpret information from the materials provided.
7. MAIN CONCLUSIONS

- The research has evidenced how the use of geolocated social networks enriches student understanding of city spaces that make up the urban environment, which goes beyond their spatial characteristics.

- Specifically, students identified complex socio-spatial nuances from Twitter and Foursquare data, detected spatiotemporal patterns of the public space use and people perception, including sentiment about Barcelona’s city spaces on the days studied.

- The activity conducted contributed to the development of information management skills, which is a key transversal competence for the increasingly digitalized 21st century.
8. REFERENCES


Hochman, Nadav, and Lev Manovich. 2013. “Zooming into an Instagram City: Reading the Local through Social Media.”


TRANSFERRING STATE OF THE ART LBSN RESEARCH TO URBAN DESIGN AND ARCHITECTURE EDUCATION

L. Serrano-Estrada, T.J. Martin, A. Bernabeu-Bautista
University of Alicante

Session: LINKS BETWEEN EDUCATION AND RESEARCH
ICERI Sevilla, November 2019

Leticia Serrano-Estrada
PhD in Architecture
Orcid: 0000-0002-7466-1974
Researcher and Lecturer in the Urban Design and Regional Planning Unit,
Building Sciences and Urbanism Department
Email: leticia.serrano@ua.es

Tania Josephine Martin
PhD in Educational Research
Orcid: 0000-0003-1244-1201
Researcher and Lecturer
English Philology Department
Email: tania.martin@ua.es

Álvaro Bernabeu-Bautista
PhD Candidate in Architecture
Orcid: 0000-0002-2335-961X
Researcher Collaborator in the Urban Design and Regional Planning Unit,
Building Sciences and Urbanism Department
Email: alvaro.bautista@ua.es