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Lab4Act: Laboratories for Active Learning Spaces

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Learning spaces, transitional spaces, active learning, informal learning, beacon technology.

1. SUMMARY

The Lab4Act project aims to investigate, develop and assess solutions for optimizing and modernizing the transitional spaces of academic school buildings in order to promote or enhance active and informal learning. This project follows the "E-Learning Cafés" project of the University of Porto that allowed the establishment of two dynamic learning spaces on the University campus, focus on promoting the integration of social and study activities, encouraging students to exchange ideas and knowledge, fostering interdisciplinary and innovation.

2. INTRODUCTION

The profound changes in the use of spaces in learning-related activities, especially in educational contexts, were boosted by several reasons including the advances in the understanding of the processes involved in learning, the digital technology revolution and its influence on various spheres of human daily life, and the emergence of the Google generation, or 'net gen' (Tapscott, 2008), to which the current students belong.

Although it is possible to identify a vigorous growth of bibliography dedicated to the study of educational spaces (namely in the reflection on the relation between the physical space and the teaching-learning processes) several authors suggest that knowledge about this subject is still insufficient to respond to the requirements that contemporary educational contexts demand, particularly in university education (Boys, 2010; Temple, 2007).

Today we recognize the importance of transitional spaces in educational buildings. Indeed, nowadays, learning-related activities transpose the limits of educational spaces and lecture times to take place in atriums, courtyards, corridors, bars, entrances and other meeting areas (Beckers, 2016; Oblinger, 2006; Vieira & Krüger, 2015).

Currently students are motivated to position themselves as the principal agents for the construction of their own knowledge and development of competences and qualifications. The students' autonomy and engagement with active and personal construction of learning are stimulating a transposition and extension of learning activities to spaces and times outside the classroom and lecture times (Jamieson, 2009; Oblinger, 2006). Transitional spaces should therefore not be interpreted as mere links between classrooms, since they play a different role in the daily life of the schools: they take the place of choice for active and informal learning. Yet, for the most part, this set of spaces has not been conceived under this assumption, and therefore it is urgent to rethink and seek solutions to promote new forms of use and appropriation in learning related activities. Indeed, the design and materialization of buildings are linked to pedagogical foundations and curricula that will favour or inhibit educational practices, such as a 'spatialized' pedagogy (Monahan, 2000).

The Lab4Act project was born out of this recognition and seeks to investigate the relationship between non-teaching spaces and active and informal learning in order to propose new spatial solutions or adaptations to improve it.

To some extent this project follows on the "E-Learning Cafés" project of the University of Porto, which offered to students and academic staff of higher education two innovative spaces of study and social interaction, aiming to optimize the conditions for active and interdisciplinary learning (Ribeiro et al., 2013; Vieira et al., 2009). The "Asprela Polo" E-Learning Café, inaugurated in January 2008, achieved by the refurbishment of an existent building, was an important step towards achieving this goal and is at present an important generator of new educational, social and cultural dynamics in the academic community. The second space of this type, the E-Learning Café of the Botanical Garden, resulting also from the rehabilitation of an old house and inaugurated by the University of Porto in October 2015, is located in an area of the city of Porto with a great heritage value, not only because of the botanical importance of its rare species, but also for being a representative example of the XVIII century farms and cottages, and, as well, for being a referential place of Sophia de Mello Breyner Andresen life and work (a Portuguese renowned writer and poetess). This space, like the previous one, is supported by a pool of information and communication technology resources and services and has quickly become a reference point for the academic community.

The Lab4Act, an exploratory project, proposes to study the links between the physical spaces and the resources they offer on the one hand, and the social relations, interactions and learning activities prevailing therein, on the other hand, to identify and reveal the potential of the spatial configuration to favour active and informal learning.

The e-Learning cafes and other common spaces of the fifteen schools of the University of Porto will be the work base of this project to propose the creation of what we call laboratories for active learning spaces (Lab4Act).

It is expected that this project can contribute to the creation of new Knowledge that may support and incentive future studies and interventions in higher education spaces.

3. OBJECTIVES

The overall objective of the project Lab4Act is to contribute to the improvement of learning in higher education through the modernization and transformation of transitional and communication spaces in university buildings to stimulate active and informal learning.

In a first phase, Lab4Act aims to analyse spatial contexts by looking for attributes that influence the choice of out-of-class spaces for activities related to active and informal learning. In a second phase, the goal is to develop, test and evaluate intervention solutions in these spaces to improve their adaptability to the new learning requirements. The general idea is to leverage each Lab4Act space for active and learning in non-teaching times through low-cost interventions which, in a first phase, will provide equipment, furniture and digital artefacts to foster active, cooperative and informal education.

4. METHODS

Bluetooth Low Energy (BLE) beacon technology will allow to monitor the dwell time of the users in the spaces, the displacement of the objects that exist according to the needs of the users, the time of usage of the available physical resources, the interaction between pairs, type of activity, among other indicators so as to be able to apprehend effects of the spatial context on students' behaviour. In other words, it will enable making meaning through relations between users, objects and spaces.

It is a low cost technology that will allow jointly with an APP to be developed within the scope of the project to map the use of the physical spaces and resources available in the environments that are being studied.

Through a comparative study on E-Learning Café and some schools of University of Porto, namely it's Faculty of Architecture (FAUP), this research purpose to investigate the interplay between space, interaction and learning activities in higher education within exterior and interior interfacing areas in terms of halls, yard, lawn, corridors etc.

The research will use a multi-layered approach, combining quantitative and qualitative data collection and analysis, with semi-structured interviews, space syntax analysis and patterns of use observation on exterior and interior interfacing areas using BLE beacon technology.

5. DISCUSSION

Currently the project is in a phase of seeking funding to be implemented at the University of Porto. In this communication we will discuss the increasing importance of non-teaching spaces in higher education environments and the use of beacon technology for the improvement of these spaces in order to promote active and informal learning activities. Additionally we will also present the results of a preliminary case study at FAUP which allowed the identification of spatial features that promote face-to-face encounters and social interactions leading to informal learning activities, like reflective conversations, collaborative work in project based learning and creativity problem solving in communities of practice.

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Andrea Pera Vieira is a BSc graduated in Mathematics by Faculdade de Ciências da Universidade do Porto (2000) and in Architecture by Faculdade de Arquitectura da Universidade do Porto (2007) and Master in Urban Planning Universidade de Aveiro (2006). MA, PhD student. The phd research is concerned with the learning spaces and how they can improve the learning activities. Junior researcher Participation in research projects E-Learning Café - Faculdade de Arquitectura da Universidade do Porto. Member of research team of CCRE in Centro de Estudos de Arquitectura e Urbanismo Faculdade de Arquitectura da Universidade do Porto. From 2009 to 2015 was Assistant Lecturer in CAAD course that is focused on communicating architecture spaces of innovative learning spaces, where interactive technologies are used to promote students learning engagement and socialization.

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