Academic Performance of Students of Urban Design, Applying Problem-based Learning (PBL)

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ABSTRACT

The urban design courses of the urban planning career in the Universidad Simón Bolívar (USB, 2017) Caracas-Venezuela, are part of the backbone of workshops (4 of 11) and invite to the study of parts of the city whose problems demand to be resolved, according to traditional teaching methods.
Considering this precedent and within the framework of the Citylab project (2015-2018), the Problem Based Learning (PBL) is implemented in Workshop VI, during the last quarter of 2017; and then a questionnaire is given to the participating students to know their opinion on the following points: their role in this process of building knowledge, and their appreciation about both the exchange with local guests-actors and this new methodology. The respondents conclude that in the face of the traditional method, the PBL promoted capacity building for critical analysis, teamwork and consensus building against the city's complex problems.

Keywords: Academic performance, Problem Based Learning, Urban design courses.

A DESCRIPTION OF CONTEXT

The urban planning career (1975) at the Universidad Simón Bolívar is structured by academic year (5 years), taught under a quarterly regime with 68 courses (basic and professional cycle) that are grouped by thematic areas or chains. One of them corresponds to urban workshops (a total of 11), which are present in each year of the professional cycle, covering physical-geographical issues, urban design, roads, urban dynamics, formulation and evaluation of plans and projects; complemented by theory courses.

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Consequently, urban planning workshops constitute their backbone and the space for teamwork in the study of the city, par excellence; and particularly those linked to urban design, which represent four of the total (from workshop III to VI).

However, the professor assumes the role of director of the process, responsible for the transmission of information and evaluation (oral presentations); using the theory-conceptual management, group work (maximum four students) and the support of proposals of urban intervention by students; with limited feedback from key players and professionals/students from other training areas, considering the short quarterly regime.

Taking into account this condition, it is decided to select workshop VI, corresponding to the end of the 3rd year of the career, as the pilot course to the application of the PBL methodology, during the quarter September-December 2017 (12 weeks); in order to analyze the potential impact of this methodology on the development of participants' capacities and possible applicability in other courses.

The workshop VI introduces students to the main elements for the design of urban regeneration proposals, under sustainability criteria and based on the identification of their problems at intermediate scale. It involves 12 students and 2 teachers responsible of the course, and plans the invitation of 8 teachers from other areas and some students of architecture and urban planning, to facilitate multidisciplinary exchanges during specific class sessions.

THEORETICAL AND PEDAGOGICAL FRAMEWORK

In face of the challenges of 21st century higher education, which involves raising global needs around the skills that new professionals require to meet the complex challenges of the world, including cities; it is essential to promote inclusive, interdisciplinary, creative, innovative and critical learning (Scott, 2015); to strengthen their research and information synthesis capabilities for the development of solutions.

In front of this panorama, it is convenient to review the traditional teaching, where the teacher acts as the main learning's motor of the students. An approach that according to Rodríguez (2013):

> *Is eminently expository, the evaluation of learning is reproductive, focused on the qualification of the result, the teacher-student relationship is authoritarian, is*

based on the conception of the student as a receiver of information, as an object of knowledge (p.4).

It is interesting to consider the Problem Based Learning (PBL[i]) as a strategy of teaching and learning, supported by discovery and collective construction of knowledge. It seems to encourage the student to appropriate the process and the collection, organization and selection of information (Restrepo, 2005); to solve the identified problem.

In this regard, problem-based learning has several meanings, from pedagogical approach, method, technique and learning strategy. In this sense, to Barrows (1986) in Morales and Landa (2004) and Savery (2006):

- It is a learning method that takes a constructivist perspective. It is focused on the student, based on the use of real problems as starting point to enable the student acquire, integrate and build new knowledge to solve the problem.
- It is a learning method that empowers students to carry out research by integrating theory and practice. It suggests that the selected problem must be aligned with the learning objectives, link the student's prior knowledge with new ones that are expected to be learned, must be complex and require an interdisciplinary approach that challenges and motivates the student. Furthermore, PBL allows analyzing and discussing a phenomenon, recognizing and accepting different interpretations (Savery, 2006).

Therefore, PBL is a "complex and dynamic" process integrated by stakeholders (academic staff and students), structures (curricula and facilities) and frameworks (content and evaluation) (Guerra et al, 2017, p.219); where learning objectives (holistic and interdisciplinary) are the ones that leading to problem design (Stinson & Milter, 1996).

Consequently, and within the framework of the European project Citylab (2016-2018), to advance on the application of the PBL in the urban workshop VI, during the quarter September-December 2017, it was necessary to make a prior adaptation of the Aalborg model as detailed in Figure 1.
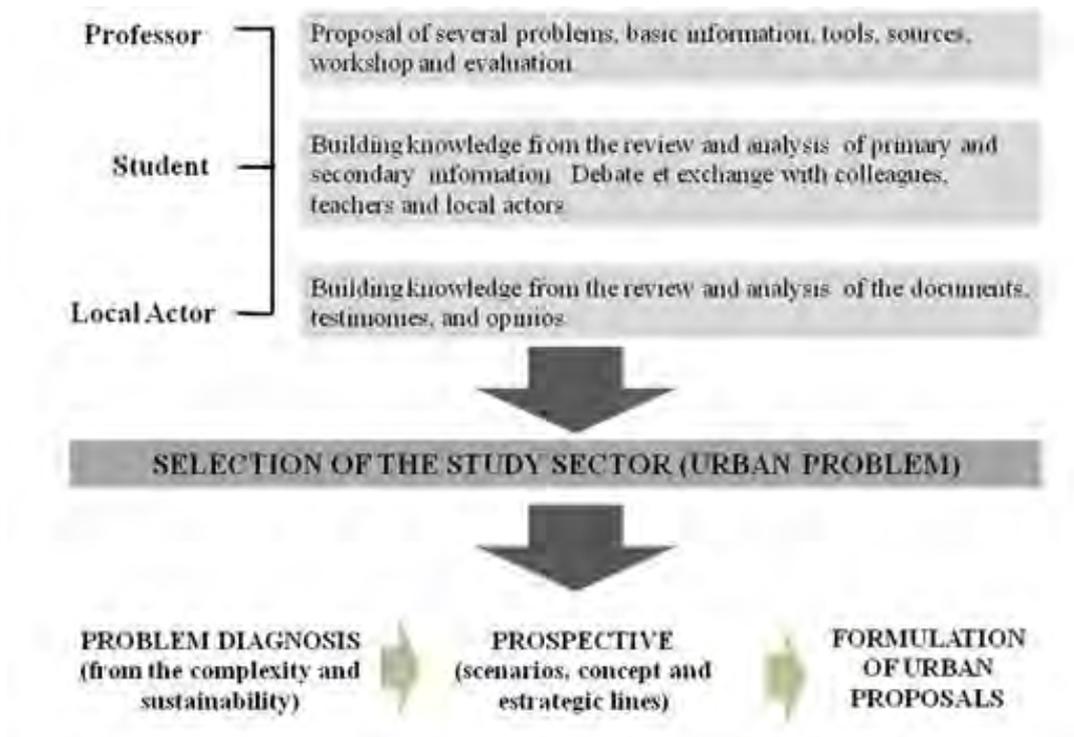
Figure 1: Conceptual framework used for the Urban Design Workshop VI. Source: Developed by the authors. 2018.

So, the real problem is an urban sector, the protagonists are the students, and the facilitators are the teachers.

Finally, this exercise carried out by teachers is evidence of its paper in the redesign of learning spaces and their measurement. Also, they participate in the promotion of innovation and creativity in face of current challenges; in the framework of INTEF's Horizont (2017) report.

CONCRETE IMPLEMENTATION AND ACTION

In order to analyze the impact of the PBL conceptual framework (figure 1) in the urban workshop VI, during the 24 class sessions (2 sessions per week and 4 hours per session); at the level of the capacities development and participants paper; the following process was implemented:

- **In the classroom**: the teachers of the workshop VI presented, during the first session, the course planning to the 12 students, organized in theoretical and practical classes, teamwork, definition of the case study, exchange with guest professionals/teachers

and visits to the problematic sector. The students were invited to be freely grouped into teams of four members each. The actual urban problem was chosen by students from three options previously selected by the teachers responsible of the workshop. Similarly, the specific exchanges with students of workshop VI and others of architecture and urban workshop IX (4th year) were held during the practical classes; whereas in the theoretical classes, the exchange took place with eight guest professors from different professions (urban planning, engineering, architecture, geography and sociology), who would provide knowledge focused on the problems identified in the study case.

- **In the urban sector**: several visits were planned, in order to obtain information related to the problems, needs and concerns of the resident community. Likewise, different local government units were consulted, with the purpose of collecting information about the case and existing urban intervention studies and/or proposals.

This allowed the students of the urban workshop VI to identify the main study case's problems, supported in the secondary and primary information. Likewise, the formulation of a first approximation to urban design proposals.

This initial proposal was subjected, in the classroom and in two opportunities, to the strategy of the World Café or Workshops (photo 1 and 2), to encourage the debate among the students participating in the urban workshop VI.

Photo 1 and 2: World Café or Workshop, Workshop VI. Source: Taken by the authors. 2017.

This strategy consists of the initial participation of one member per group, in order to explain their urban design proposal; which is followed by the rotation, every 15 minutes, of the others member's teams; until everyone knows the proposals of the different groups, generates opinions or contributions about it, and returns to their home group.

Consequently, it promotes the expansion and strengthening of students' knowledge from a collaborative approach and facilitates the formulation of final proposals.

The result of work carried out in the classroom and sector studied was presented orally by each group of workshop VI, accompanied by plans, models and portfolios delivered digitally; all of them in front of the guest teachers and within a scheme of validation of acquired knowledge. Both the process and the final result were taken into account; as well as the orderly communication skills expressed in a clear and concise manner (Branda, 2009). Finally, the student self-assessment was also used.

Once the learning experience under the PBL method was completed, a questionnaire was given to the 12 students of workshop VI, structured by 10 questions (open and close types) associated with the recognition of the student paper, the appreciation that the student makes about exchanging with guests and local actors, their qualification of the application of the PBL (utility, complexity, dedication, group work, communication and contribution in the development of new skills), and the possibility of replicating the methodology in other courses; and the results achieved are presented below.

RESULTS AND REFLECTIONS

Once the responses given by the students of the urban workshop VI were processed, the following results are highlighted:

- All course students (12) reported conducting a previous documentary review, visiting the study sectors and making contact with local actors.
- 9 students out of 12 students says that meetings with local actors helped them understand the real needs of the community, identify structural problems, and move towards feasible solutions.
- The totality of the student (12) ensure that exchanges with students of architecture, urban planning and guest teachers of various specialties provided a contribution to their performance in the course.
- 7 students out of 12 students argues that the PBL methodology promotes research, debate and new approaches to knowledge.
- 4 students out of 12 students ensure that the implementation of the PBL requires strengthening leadership and time management skills.
- 8 students out of 12 students considers that the products generated were built by themselves, while 4 students says they were developed among students and teachers.
- On a maximum rating scale of 5 points, students recognize that the PBL demands greater dedication (4.9/5), teamwork (4.81/5) and communication (4.72/5).

- 8 students out of 12 students considers the application of the PBL in other courses included in the career is feasible and desirable, but recognize that a prior preparation must exist.

As shown, the impact generated by the implementation of the PBL conceptual framework in the urban workshop VI can be considered favorable, exceeding by more than 60% (7 students out 12 of students) the positive responses around the multidisciplinary and collaborative work involved. It does not appear to have meant an obstacle the exchange with other students and guest professors, or with the actors involved in the study case; and neither the searching and processing of information. Perhaps, the workshop mode, typical of the urban planning career from its origin, facilitated the performance of the participants.

Likewise, the most claim that the PBL method was useful in strengthening their capacities of critical analysis, teamwork, communication, and building consensus against various interests. They also achieved new forms of knowledge about urban design, derived from interdisciplinary meetings and the argumentation of its work.

However, students emphasize and recognize the need to strengthen certain soft skills or competencies, in order to take advantage of this type of methodology; such as: leadership, time management and effective communication strategies; which helps avoid resistance to change.

Thus, the PBL demonstrates a potential to the improvement and updating of the teaching process according to the needs of the 21st century. From the point of view of the scope of the learning objectives of workshop VI, the interdisciplinarity required the inclusion of additional theories, according to the problems identified; within the framework of a short academic period (quarterly), typical of the USB.

In this way, the teacher training in PBL is essential to achieve the new trends of collaborative learning. This condition demands a necessary revision of the academic program to achieve a balance between the scale of the problem to be studied. Equally, the thematic scope of the courses and the skills proposed to strengthen in the students.

Therefore, the challenge is to communicate and spread this experience results, and to generate teaching and learning strategies for the knowledge society.

References

Branda, L. (2009) El aprendizaje basado en problemas. De herejía a res popularis. [Problem-based learning from heresy to res popularis]. Autonomous University of Barcelona. Retrieved (05/24/2018) from: http://scielo.isciii.es/ scielo.php?script=sci_arttext&pid=S1575-18132009000100004#bajo.

Dueñas, V. H. (2001) El aprendizaje basado en problemas como enfoque pedagógico en la educación en salud. [Problem-based learning as a pedagogical approach in health education.] Medical Colombia [online], vol. 32, number 4. Retrieved (07/17/18) from: <http://www.redalyc.org/articulo.oa?id=28332407> ISSN 0120-8322.

Guerra, A., Rodriguez-Mesa, F., González, F. A., & Ramírez, M. C. (red.) (2017). Aprendizaje basado en problemas y educación en ingeniería: Panorama latinoamericano. [Problems based learning and engineering education: Latin American Panorama]. Aalborg: Aalborg Universitetsforlag. Retrieved from: http://vbn.aau.dk/ files/262849868/ Latin_Case_online.pdf.

INTEF (2017): Summary Horizon Report - Higher Education. The NMC Horizon Report: 2017 Higher Education Edition. Ministry of Education, Culture and Sports-Government of Spain. Department of European Projects. Retrieved from: http://educalab.es/documents/10180/38496/Resumen_Informe_Horizon_2017/444 57ade-3316-418e-9ff9-fd5e86fc6707

Morales, P., & Landa, V. (2004): Aprendizaje Basado en Problemas. [Problems based learning]. *Theoria, 13*, pp.145-157.

Restrepo, G. B. (2005). Aprendizaje basado en problemas (ABP): una innovación didáctica para la enseñanza universitaria. [Problem-based learning (PBL): a didactic innovation for university teaching.]. Education and Educators, 8, 9-19. Retrieved (06/19/18) from:<http://www.redalyc.org/articulo.oa?id=83400803> ISSN 0123-1294.

Rodríguez C., J. (2013). Una mirada a la pedagogía tradicional y humanista. [A look at traditional and humanistic pedagogy]. University presence magazine, year 3, No. 5. Autonomous University of Mexico.

Savery, J.R, (2006): Overview of problem-based learning: Definitions and distinctions. *Interdisciplinary Journal of Problem- Based Learning,* 1(1), 3.

Scott, C. L. (2015). El futuro del aprendizaje 2. ¿Qué tipo de aprendizaje se necesita en el siglo XXI? [The future of learning 2. What kind of learning is needed in the

21st century?] UNESCO-Research and Prospective in Education- Working documents.

Stinson, J.E. & Milter, R.G. (1996). Problem-Based Learning in Business Education: Curriculum Design and Implementation Issues. Accepted for publication, *New Directions in Teaching and Learning in Higher Education*.

Universidad Simón Bolívar (USB) (2017): Programa Analítico del Taller de Urbanismo: Diseño Urbano VI [Analytic programs of the Urban Design Workshops VI] Department of Urban Planning. Available in: http://www.pl.usb.ve. Plan de Estudio de la carrera de Urbanismo [Urbanism Study Plan]. Academic Coordination of Urban Studies. Available in: http://www.urb.coord.usb.ve

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[i] It emerged in the late 1960s, initially applied at McMaster University in Hamilton, Canada (Dueñas, 2001) for the study of medicine, then at Case Western Reserve School of Medicine, Cleveland in the United States; spreading to different educational institutions in Europe, the United States and later in some of Latin America.