

Combining community-based learning and project-based learning: A qualitative systemic analysis of the experiences and perceptions of students and community partners

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Abstract

This article presents findings regarding a community-based learning experience that took place from 2014 to 2017, involving 379 undergraduate students from the Federal University of Sao Paulo. The students developed 82 projects on behalf of 20 community partners (NGOs, public institutions, hospitals, libraries and individual families). The research objective is to reveal the experiences and perceptions of the students and community partners who participated in community-based learning centered courses. Qualitative data was analyzed following a qualitative systemic analysis, revealing: a) working in real-life situations motivates students to do their best, however, the difficulties of real-life projects may negatively impact student motivation; b) the need to solve real-life problems encourages students to search for learning opportunities; and c) the many benefits (material, educational, research opportunities, motivational) of academic projects serve to foster the continuity of the partnership.

Keywords: community-based learning, project-based learning, project management, action research, qualitative systemic analysis.

This article discusses the experiences and perceptions of the students and community partners who participated in courses that combined a community-based learning strategy and a project-based learning approach. The course, Project Elaboration and Management, is required for undergraduate students of Economics and Accountability and is optional to the students of Administration and International Relations at the Federal University of Sao Paulo, in Osasco, Brazil. The course objective is to provide the students with theoretical background and practical experience in project management.

The 15-week course follows a community-based learning (CBL) strategy: the students learn by doing real-life projects on behalf of community partners such as NGOs, public institutions, hospitals, libraries and individual families that help people in need. The professor works closely with the community partners (CPs), defining together the project themes and the learning objectives.

The CBL strategy was implemented by following a Project-Based Learning (PBL) approach (Appendix 1). The students are challenged to put theory learned in class into practice, and to reflect on their own learning and on the systemic impacts the projects bring to society. The students work in teams of five members on average, developing projects with clearly defined deliverables and milestones. Each student team also develops a project blog that brings together managerial information about the project.

From 2014 to 2017, the course was taught 16 times, involving 379 students during which time 82 projects were completed (Appendix 2) on behalf of 20 community partners (Appendix 6). Of the projects completed, 69 (84%) were deemed successful, meaning students were able to achieve learning objectives and also deliver the product or service they planned to create. Four projects (5%) were partially successful in that the students were not able

to achieve all the learning objectives or the product/service created was not totally in accordance with the planning. Nine projects failed (11%), with students unable to achieve the learning objectives and the planned product/service unable to meet the project's objectives.

The main reasons for project success were the students commitment and effort (100% of the successful projects) and the right utilization of project management tools (91% of the successful projects). The main reason for failure was the lack of student commitment and effort (100% of the projects that failed).

The projects led to the creation of 14 categories of products and services, ranging from equipment acquisitions to marketing campaigns (Appendix 7). Of those, 70% involved fundraising activities where students secured funds from individuals (35 projects), raffles (32 projects), small corporate donations (24 projects), selling of products (13 projects), social network donations (11 projects), large corporate donations (six projects), medium-size corporate donations (two projects) and event creation (one project).

The professor and the students were able to publish eight articles about the projects in peer-reviewed international journals.

Theoretical Review

In order to have better understanding of this research it is important to understand the concepts of CBL, PBL, and qualitative systemic analysis.

Qualitative systemic analysis (Northcutt & McCoy, 2004; Rolando, 2015; Salomon, 1991; Salomon & Lowyck, 2006;) has its roots in systems thinking theory (Forrester, 1961, 1968,1990; Senge, 1990). A system can be understood as a group of interconnected components organized in a way that allows it to accomplish something (Meadows, 2008; Sterman, 2000). A course is an example of a system: its elements are the students, the

professor, the place where the course is taught, the stakeholders (community partners), and the educational approach. A course may have multiple goals, including delivering subject contents to the students and developing their skills, for example. A system has a structure that determines its behavior (Bossel, 2007; Capra 2004). Coming back to our example, a course has its structure: it has rules, activities, schedule, requirements, and so on. Researchers (Senge et al., 2012) point that a course's structure influences the students' behavior.

A system may have feedback loops; that is, the current state of one part of the system may suffer influences from other parts of the system or can even be influenced by its past states (Sterman, 2001). Returning to our example, a current student's motivation with a course can be influenced (positively or negatively) by the grade he/she has received previously from the professor. One can understand the system's structure by understanding its feedback loops. The system's feedback loops can be represented by causal loop diagrams (O'Connor & McDermott, 1997), a system dynamics qualitative modeling tool (Sterman, 2000).

A qualitative systemic analysis can be understood as the detailed examination and interpretation of a system's structure (Wolstenholme & Coile, 1983). A qualitative systemic analysis, when applied along the years to a system, may reveal typical dynamics that unfold year after year (Kim & Anderson, 1998; Meadows, 2008). By studying these, the researcher can develop a clear understanding of the system and the relationships between its components.

In our research, we collected qualitative data related to a sequence of 16 identical courses that ran for four years. The recurrent themes (Bradley, Curry & Denvers, 2007) that emerged from the data year by year made it possible to identify the main dynamics that were present in all courses. We represented these dynamics by means of a causal loop diagram, revealing the effects of the combination of CBL strategy and PBL approach on the students' motivation and learning.

CBL can be understood as an educational approach where the students learn by accomplishing projects or developing services on the behalf of communities (Jacoby, 2014). Scholars note that CBL may bring benefits to the parties involved, such as increasing the students' interest in what is taught (Prast & Viegut, 2014), fostering knowledge sharing between students and communities (Jacoby, 2003), and strengthening the bonds between schools and communities (Cantor, 1997). In addition, scholars point out that CBL may enhance learning (Hall & Hall, 2002; Markus, Howard, & King, 1993), since it provides experiential learning (Furco, 1996). The students learn while doing practical activities and reflecting on them.

CBL can be developed following a PBL approach (Jacoby, 2014). Project-based learning is an instructional method where the students work in teams, developing a project that will lead to the creation of a product or service (Thomas, 1999). In this approach, the students are challenged to learn by themselves (Bell, 2010) while the professor acts as a consultant, giving the students guidance and orientation. In a typical PBL course, the professor defines the project milestones and deliverables (Savery, 2015). During the course, the professor may promote opportunities for the students to reflect together about their findings (Bender, 2012), sharing best practices and other lessons learned while accomplishing project activities (Larmer, Mergendoller, & Boss, 2015). Scholars (Grant, 2011; Larmer & Mergendoller, 2010) have pointed out that PBL may help the students to develop skills in communication, critical thinking and problem solving.

Scholars have found that PBL works better when the students work to solve real-life problems (Hernandez, Ravn, & Valero, 2016; Nowrouzian & Farewell, 2013) and even better when they work with the support of community organizations (Zlotkowski, 1998).

Recently, scholars have reported on courses that combined the CBL strategy and PBL approach, which led to development of projects with organizations that help people in need (Arantes do Amaral & Okazaki, 2016). Scholars (Arantes do Amaral & Matsusaki, 2017; Dorado & Giles, 2004; Jacoby, 2003; Wright, 2011) have pointed out that creating such partnerships can be a long, complex and dynamic process.

The benefits of combining CBL and PBL include the empowerment of students (Arantes do Amaral & Frazão, 2016) and the intense knowledge sharing between the students and community partners (Arantes do Amaral, 2017).

Methods

This effort used an action research approach to consider what students and community partners experience in community-based courses. Scholars describe action research as an approach to knowledge creation (Bradbury-Huang, 2010; Burns, 2007) that combines action with research, involving collaboration between the researchers and the participants (Thiollent, 2011) that aims to find solutions to real-life problems (Bradbury, 2015). It develops following continuous cycles of improvement (Stringer, 2013) in planning, execution of the activities, collection of data, reflection on these data, and planning improvement for the following cycle (Kolb, 2014; Stringer, 2008). This research was developed through a sequence of action research cycles (Figure 1). In each course, we planned the projects with the support of the community partners. After that, the students developed the projects. During the courses, we collected data on the project's results, on the students' assessment of their own learning,

and on the community partners' assessment of the students' work. Based on these data, we reflected on what worked and what did not, and used the information to improve the planning for the following year's course. In this way, we continually refined the course materials, classroom activities, and the means of exchanging knowledge between all involved.

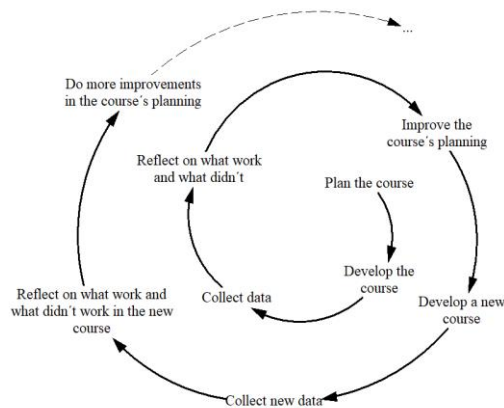


Figure 1. The action research spiral, applied to the course improvement. Figure created based on Burns (2007) and Kolb (2014).

The participants

In total, 379 undergraduate students of economics, accounting, administration and international relations from the Federal University of Sao Paulo Osasco Campus (Appendix 3) participated, along with 20 community partners (Appendix 4), which included 16 non-governmental organizations, one public institution, one hospital, one university library, and one family in need.

Data collection

The data was collected from questionnaires sent to students, notes from focus groups, community partner evaluations of the student projects, student project documents, course website, and community partner websites.

Student questionnaires included 14 open-ended questions (Appendix 5) designed to collect data about the projects, such as the strategies used, the problems the students faced, the way the students dealt with problems, and what the students learned. The professor took the notes from the focus groups. In these sessions, the goal was to clarify students' answers to the questionnaires.

At the end of each project, the professor asked the community partners to evaluate the student teams. The evaluation covered not only the project achievements, but also the community partner observations about the students' learning and behavior.

Each student team created a project blog to make available all project managerial documents, including the project's charter, the work breakdown structure, the network of

project activities, the communication procedures, the fundraising strategies, the risk management plan, the project control charts, the information and pictures of the product or the service created, and the lessons learned.

The course website linked to all the student project blogs and provided information about the research articles published. Media coverage on the course was also included on the website.

The community partners' websites were viewed to collect information on the goals of the work accomplished by each community partner, its mission, its programs, and the community members served.

Data analysis

The qualitative data was analyzed following the five-phase method, as proposed by Yin (2015): compile the data, disassemble data, reassemble data, interpret data, and conclude. Following the method, the qualitative data initially was compiled into a database. Then the data was disassembled into sentences, each sentence with one main idea. The related sentences were grouped into categories. In sequence, the data was interpreted and the categories were grouped into broader groups of recurrent themes (Curry & Nunez-Smith, 2014).

The fifth phase, the conclusion, was accomplished by considering the interrelationships among the qualitative data analysis results (the recurrent themes, thereafter RT) by means of a qualitative systemic analysis.

Results

Five recurrent themes emerged from the analysis of student answers to the questionnaires and from the focus group notes taken by the professor.

1. *Working on behalf of people in need motivates the students to work hard and pursue social justice.*

The students let us know that working with CPs and people served by the communities was a very meaningful experience. One group reported:

We learned how simple actions might bring a huge impact on the lives of other people. The work we did was very important to the elders. Getting in touch with the elders brought us joy and happiness; it was a priceless experience!

Another group commented:

Working with these institutions was extremely motivating. We learned by doing, we felt good by helping people in need. It was very stimulating to know the work of these organizations, the good work they are doing on behalf of our city. This year we are leaving the university, but we will always remember the work we have done here, and

probably we will influence the corporations in which we will be working in the future to finance projects on behalf of people in need.

The students also expressed their gratitude for having an opportunity to contribute to create a better society, to fight against social injustice. One group of students stated:

We made a difference with our project, we left a mark in the community. As students of a free public university it is our duty to give back to the society at least part of what we received from it.

Students also reported their enjoyment in the process:

The participation of the children and the teenagers was very intense! They worked with us in small group in painting activities. They were excited and curious.

They also commented on life lessons learned and an improved sense of responsibility:

We are very thankful to the professor and to the NGO for the opportunity they provided to us. It was much more than a course, it was a life experience that we will keep forever with us. The course was very innovative, it took us far from our comfort zone; we became more proactive. Our goal was greater than only to be approved in the course.

2. *The academic projects demanded time, effort, and commitment for success.*

The students reported several difficulties, first and foremost coordinating schedules. Second, the students noted that the course was very demanding, citing lack of time to perform some of the project activities due to the fact that many of them worked during the day and attended university at night. One group of students explained:

Our main problem was the lack of time to accomplish the project's activities, since all team members work. The solution we found was to use social networks (Facebook) to facilitate the communication between us and to avoid the need of face-to-face meetings.

Third, they also reported that peer conflict emerged over lack of collaboration, differing views on ideas, and strategies that all could agree upon. One team described the problem:

Our major problem was the irresponsibility of some of our team members. We solved this problem by re-allocating their tasks to all the team members who were more collaborative.

Fourth, students reported challenges in conducting fundraising activities:

We faced difficulties in running raffles. Some colleagues did not make the necessary effort, it compromised our friendship.

Another group added:

It was difficult to get in touch with big companies in order to ask for donations: there were communications barriers.

3. *The real-life projects taught students how to apply project-management theory in practice.*

The students enjoyed learning by doing, which they noted as exciting and interesting. Further, they acknowledged that working in a real project helped them to consider "fixes" to the theoretical content based on their experiences.

They acknowledged that they learned how to plan a project, and how to do re-planning whenever it was necessary. One group of students reported:

We used the project management techniques learned in the course in our project, mainly the WBS (Work Breakdown Structure): the project plan was essential to keep the project organized ... the project was very arduous, but worth it. The project allowed us learn management tools and to implement a real project. It was also motivating because we worked with an institution that takes care of children.

Students also reported they learned how to work in teams, define roles and responsibilities, manage project risks, develop fundraising activities, control project activities, and manage project communications. They reported the benefits as being not only academic, but personal as well.

4. *The projects fostered intense knowledge sharing among all participants.*

The CPs let us know that they learned project management techniques, thanks to the interaction with students, year after year. One CP reported:

We learned from the students' blog; we liked the process the students followed to develop the project. Actually, we are using what we have learned in our NGO.

Another NGO reported:

The team of students that worked with us was very serious and worked very hard. They shared with us the problems they faced and the solutions they found to solve those problems.

The students learned from the CPs' community knowledge of critical social problems. The students also acknowledged their learning from the other teams, based on report presentations by one team that could be used by another.

5. *The projects not only brought economic benefits to the CPs, but also helped motivate them.*

The CPs reported the products and services delivered were useful in helping them to save money and improve the services they perform in the communities they assist. One CP pointed out:

Our organization always needs to acquire crutches. Unfortunately, it is difficult to buy as much as we need due to lack of financial resources. This project helped us to provide crutches to the people that need.

More than that, the CPs let us know that working with young, idealistic students was meaningful. One CP reported:

A project like this one motivated us; it motivated us to improve our work. It showed us the importance of the work we are doing, it showed us that we are following the right path...the children of our organization were very happy with the wonderful books they received from the students.

Discussion

As the students' motivation increased, they worked harder to accomplish the project activities. As the projects unfolded, the students were able to see the results of their efforts, which in turn motivated them to continue their hard work (Figure 2, positive feedback loop named "Doing good motivates").

The quantitative data reinforces this analysis: the students had the opportunity to choose their CPs from among organizations that help people in need in different ways (Appendix 3). We conjecture that because the institutions presented students with diverse project themes, students felt more challenged – and therefore more motivated. The quantitative data also shows that the number of successful projects was high (84%) and the main reason for the success was students' commitment and effort.

However, we also discovered, perhaps not surprisingly, that real-life projects are not simple. The students faced conflicts, communication difficulties, fundraising troubles, fatigue, and the need to rework. These problems created stress, which negatively impacted the students' motivation to work (Figure 2, negative feedback loop named "Real-life projects are not easy"). The project failures (11%) and partial successes (5%) revealed the main cause of trouble arose from students' lack of commitment and effort.

Therefore, it seems that the two aforementioned feedback loops ("Doing good motivates," and "Real-life projects are not easy") oppose each other. However, as the number of successful projects surpasses the number of projects that failed, it is reasonable to affirm that the positive feedback loop has prevailed over the negative feedback loop in courses studied.

This leads to the first finding:

1. *Working in real-life projects on behalf of a network of community partners that help people in need motivates students to do their best to accomplish the projects; however, real-life projects may also bring difficulties that could negatively impact student motivation.*

This finding is aligned with the findings of other researchers (Garrick & Clegg 2001; Ribeiro, 2011), who point out that real-life projects may bring burdens and additional workload to students and teachers, negatively impacting their motivation; yet more often than not, students learn how to solve those problems.

This research project also revealed that students were able, generally, to apply the project management theory they were exposed to in our theoretical classes (Figure 2, positive feedback loop named "Putting theory into practice"). The quantitative data reinforces that, since the students acknowledge that the right utilization of project management tools helped to accomplish the projects successfully. In addition, students put to use what they have learned from their peers (Figure 2, loop "Learning from peers"), from the CPs (Figure 2, loop "Learning from local knowledge") and with their own previous errors and successes (Figure 2, loop "Learning from their own actions").

Therefore, it seems that the hands-on approach created a positive feedback loop ("Putting the theory into practice") that helps the students search for learning opportunities. The students' actions trigger the appearance of three other reinforcing feedback loops ("Learning from their own actions," "Learning from community partners," and "Learning from peers"). The more the students learned, the more they were able to accomplish the project activities. That the positive feedback loop, "Putting the theory into practice," reinforced the positive feedback loop, "Doing good motivates," led to the next finding:

2. *The need to solve real-life problems helps the students to search for solutions, which encourages self-learning, learning with peers and learning with community partners.*

This finding is aligned with the findings of other scholars (Barron et al., 1998; Blumenfeld et al., 1991; Larmer, Mergendoller, & Boss, 2015) who point out that project-

based learning motivates students to learn by themselves. It is also in accordance with researchers that found community-based learning fosters interpersonal learning (Mündel & Schugurensky, 2008) and learning with community partners (Blouin & Perry, 2009; Holland & Robinson, 2008).

Over the years, the number of successful projects in this program have increased, prompting increased interest by the CPs to keep the partnerships going, and offering more interesting project opportunities to the students (Figure 2, loop “Benefits to the community and to the students”). As the CPs offer more diverse and interesting themes to the students, it increases students’ motivation to work. In other words, the positive feedback loop “Benefits to the community and to the students” reinforces the positive feedback loop “Doing good motivates.”

In addition, the projects also brought benefits to the university through positive media coverage. More than that, the projects created research opportunities for scholars and students (Figure 2, loop “Benefits to the university”). The academic benefits to the university and to the professor increased the professor’s motivation to improve the course learning environment and the quality of the community partnerships, which led to the third finding:

3. *The academic projects bring many benefits (material, educational, research opportunities, motivational) to the participants, which foster the continuity of the partnership.*

This finding aligns with the findings of other researchers (Marullo & Edwards, 2000) that point out that community-based academic projects may bring not only material and educational benefits, but also contribute to the improvement of the mental models of participants. This finding is also aligned with the work of scholars (Arantes do Amaral &

Frazão, 2016; Jacoby, 2014) who note that community-university partnerships improve the CPs’ capacity to provide benefits to the people served by them.

Final remarks

Returning to our research question, “What do the students and community partners experience in community-based courses?” we were able to uncover the beneficial impacts that led the students to learn from their peers, from their actions, and from their interactions with the community partners. While this is not a particularly new discovery, what was surprising is that the qualitative systemic analysis also revealed that real-life projects involving community partners create dynamics that brought stress to the students. That is, the learning dynamics are counterbalanced by the stress dynamics. We saw that there is indeed a delicate balance to achieve in teaching. If the projects press the students too much, the educational benefits may be outweighed by the stress generated.

Indeed, real-life projects bring stress to the participants. By following this educational approach, students will be better prepared to face the problems they will encounter at work and in the community post-graduation.

References

- Arantes do Amaral, J. A., & Gonçalves, P. (2015). The use of system thinking concepts in order to assure continuous improvement of project based learning courses. *Journal of Problem Based Learning in Higher Education*, 3(2), 109-119.
- Arantes do Amaral, J. A., & Frazão, C. H. (2016). The systemic impacts of an educational project conducted by one university in partnership with fifteen organizations. *Science Education International*, 27(3), 391-418.

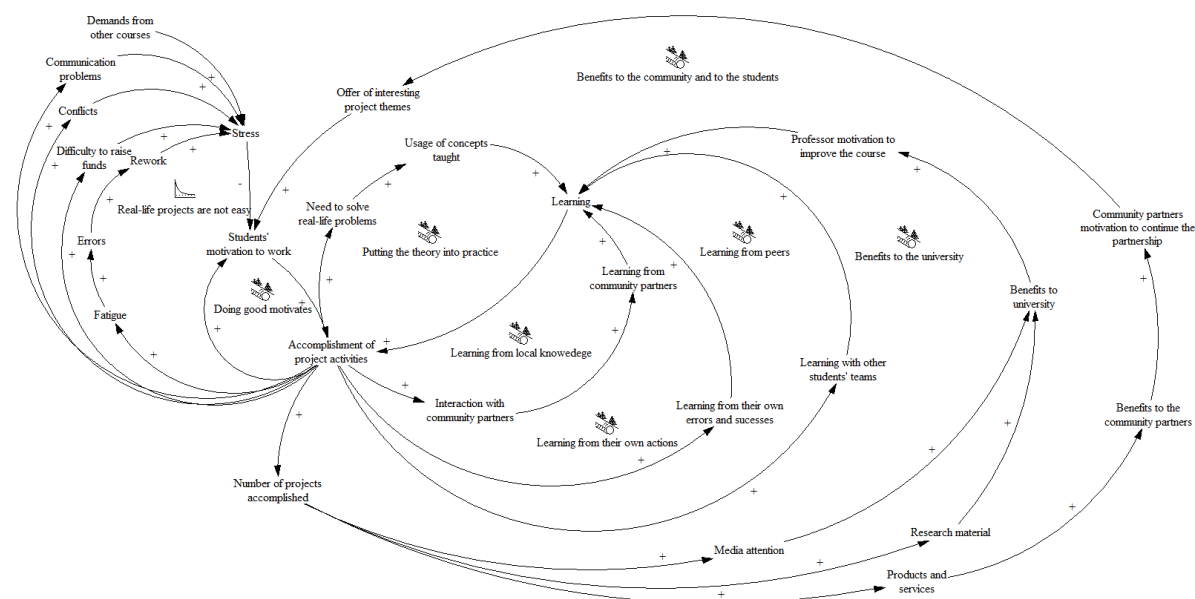


Figure 2. The systemic impacts of the projects.

- Arantes do Amaral, J. A., & Okazaki, E. (2016). University students' support to an NGO that helps children with cancer: Lessons learned in thirteen academic projects. *International Journal of Action Research*, 12(1), 38-58.
- Arantes do Amaral, J. A., Petroni, L. M., & Hess, A. (2016). Fundraising strategies developed by MBA students in project-based learning courses. *Journal of Problem Based Learning in Higher Education*, 4(1), 91-99.
- Arantes do Amaral, J. A. (2017). The dynamics of project-based learning extension courses: "The laboratory of social projects" case study. *Journal of Problem Based Learning in Higher Education*, 5(2), 49-60.
- Arantes do Amaral, J. A., & Matsusaki, C. T. M. (2017). The dynamics of connecting universities, non-governmental organizations and community members by means of academic projects directed at people in need. *Educational Action Research*, 25(2), 280-299.
- Arantes do Amaral, J. A. (2018). Reflections on thirteen years directing community-based learning projects. *Collaborations: A Journal of Community-Based Research and Practice*, 2(1), 1-19.
- Barron, B. J., Schwartz, D. L., Vye, N. J., Moore, A., Petrosino, A., Zech, L., & Bransford, J. D. (1998). Doing with understanding: lessons from research on problem-and project-based learning. *Journal of the Learning Sciences*, 7(3-4), 271-311.
- Bell, S. (2010). Project-based learning for the 21st century: skills for the future. *The Clearing House*, 83(2), 39-43.
- Bender, W. N. (2012). *Project-based learning: Differentiating instruction for the 21st century*. New York: Corwin Press.
- Blouin, D. D., & Perry, E. M. (2009). Whom does service learning really serve? Community-based organizations' perspectives on service learning. *Teaching Sociology*, 37(2), 120-135.
- Blumenfeld, P. C., Soloway, E., Marx, R. W., Krajcik, J. S., Guzdial, M., & Palincsar, A. (1991). Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational psychologist*, 26(3-4), 369-398.
- Bossel, H. (2007). *Systems and models: complexity, dynamics, evolution, sustainability*. Norderstedt: BoD-Books on Demand GmbH.
- Bradbury-Huang, H. (2010). What is good action research? Why the resurgent interest? *Action Research*, 8(1), 93-109.
- Bradbury, H. (2015). *The Sage handbook of action research*. Los Angeles, CA: Sage.
- Bradley, E. H., Curry, L. A., & Devers, K. J. (2007). Qualitative data analysis for health services research: developing taxonomy, themes, and theory. *Health Services Research*, 42(4), 1758-1772.
- Burns, D. (2007). *Systemic action research: A strategy for whole system change*. Chicago, IL: Policy Press.
- Cantor, J. A. (1997). *Experiential learning in higher education: Linking classroom and community*. Washington, DC: ERIC Digest.
- Capra, F. (2004). *The hidden connections: A science for sustainable living*. New York: Anchor.
- Creswell, J. W. (2013). *Research design: qualitative, quantitative, and mixed methods approaches*. Thousand Oaks, CA: Sage Publications.
- Creswell, J. W., & Miller, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice*, 39(3), 124-130.
- Curry, L., & Nunez-Smith, M. (2014). *Mixed methods in health sciences research: A practical primer*. Thousand Oaks, CA: Sage Publications.
- Dorado, S., & Giles Jr, D. E. (2004). Service-learning partnerships: Paths of engagement. *Michigan Journal of Community Service Learning*, 11(1), 25-37.
- Forrester, J.W. (1961). *Industrial dynamics*. Boston, MA: Productivity Press.
- Forrester, J.W. (1969). *Urban dynamics*. Boston, MA: Productivity Press.
- Forrester, J.W. (1990). *Principle of systems*. Boston, MA: Productivity Press.
- Furco, A. (1996). Service-learning: A balanced approach to experiential education. In Taylor, B. and Corporation for National Service (Eds.), *Expanding boundaries: Serving and learning* (pp. 2-6). Washington, DC: Corporation for National Service.
- Garrick, J., & Clegg, S. (2001). Stressed-out knowledge workers in performative times: A postmodern take on project-based learning. *Management Learning*, 32(1), 119-134.
- Gibbs, G. R. (2008). *Analysing qualitative data*. Thousand Oaks, CA: Sage Publications.
- Grant, M. M. (2011). Learning, beliefs, and products: students' perspectives with project-based learning. *Interdisciplinary Journal of Problem-based Learning*, 5(2), 37-69.
- Hall, I., & Hall, D. (2002). Incorporating change through reflection: community based learning. In R. MacDonald, J. Wisdom(Eds.), *Academic and educational development: Research, evaluation and changing practice in higher education* (pp.99-111). Sterling, VA: Taylor & Francis.
- Hernandez, C., Ravn, O., & Valero, P. (2016). The Aalborg university PO-PBL model from a socio-cultural learning

- perspective. *Journal of Problem Based Learning in Higher Education*, 3(2), 16-36.
- Holland, B., & Robinson, G. (2008). Community based learning with adults: Bridging efforts in multiple sectors. *New Directions for Adult and Continuing Education*, 2008(118), 17-30.
- Jacoby, B. (2003). *Building partnerships for service-learning*. San Francisco, CA: John Wiley & Sons.
- Jacoby, B. (2014). *Service-learning essentials: Questions, answers, and lessons learned*. San Francisco, CA: John Wiley & Sons.
- Kim, D. H., & Anderson, V. (1998). *Systems archetype basics: From story to structure*. Waltham: Pegasus Communications.
- Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. Upper Saddle River, NJ: Pearson Education.
- Larmer, J., Mergendoller, J., & Boss, S. (2015). *Setting the standard for project based learning*. Alexandria, VA: ASCD.
- Larmer, J., & Mergendoller, J. R. (2010). Seven essentials for project-based learning. *Educational Leadership*, 68(1), 34-37.
- Markus, G. B., Howard, J. P., & King, D. C. (1993). Integrating community service and classroom instruction enhances learning: Results from an experiment. *Educational Evaluation and Policy Analysis*, 15(4), 410-419.
- Marullo, S., & Edwards, B. (2000). From charity to justice: The potential of university-community collaboration for social change. *American Behavioral Scientist*, 43(5), 895-912.
- Meadows, D. H. (2008). *Thinking in systems: A primer*. White River Junction, VT: Chelsea Green Publishing.
- Mills, J. E., & Treagust, D. F. (2003). Engineering education—Is problem-based or project-based learning the answer. *Australasian Journal of Engineering Education*, 3(2), 2-16.
- Mündel, K., & Schugurensky, D. (2008). Community based learning and civic engagement: Informal learning among adult volunteers in community organizations. *New Directions for Adult and Continuing Education*, 2008(118), 49-60.
- Northcutt, N., & McCoy, D. (2004). *Interactive qualitative analysis: A systems method for qualitative research*. Thousand Oaks, CA: Sage.
- Nowrouzian, F. L., & Farewell, A. (2013). The potential improvement of team-working skills in biomedical and natural science students using a problem-based learning approach. *Journal of Problem Based Learning in Higher Education*, 1(1), 84-93.
- O'Connor, J., & McDermott, I. (1997). *The art of systems thinking*. San Francisco: Thorsons.
- Prast, H. A., & Viegut, D. J. (2014). *The clarity series: Community-based learning: awakening the mission of public schools*. Thousand Oaks, CA: Corwin Press.
- Ravid, R. (2014). *Practical statistics for educators*. Lanham, MA: Rowman & Littlefield.
- Ribeiro, L. R. C. (2011). The pros and cons of problem-based learning from the teacher's standpoint. *Journal of University Teaching and Learning Practice*, 8(1), 1-19.
- Rolando, L.G. (2015). The qualitative systemic analysis in the context of qualitative research methods. *European Scientific Journal*, 11(10), 25-31.
- Salomon, G. (1991). Transcending the qualitative-quantitative debate: The analytic and systemic approaches to educational research. *Educational Researcher*, 20(6), 10-18.
- Salomon, G., & Lowyck, J. (2006). The systemic vs. analytic study of complex learning environments. In E. Jan & E. R. Clark, (Eds.), *Handling complexity in learning environments: Theory and research*, (pp. 255-265). New York: Emerald Group Publishing.
- Savery, J. R. (2015). Overview of problem-based learning: Definitions and distinctions. In A. Walker, C.E. Hmelo-Silver, P.A. Ertmer (Eds.), *Essential readings in problem-based learning: Exploring and extending the legacy of Howard S. Barrows* (pp. 5-15). West Lafayette, IN: Purdue University.
- Senge, P. M. (1990). *The fifth discipline*. Currency Doubleday, London, New York: Doubleday.
- Senge, P. M., Cambron-McCabe, N., Lucas, T., Smith, B., & Dutton, J. (2012). *Schools that learn (updated and revised): A fifth discipline fieldbook for educators, parents, and everyone who cares about education*. New York: Crown Business.
- Sterman, J. D. (2000). *Business dynamics: systems thinking and modeling for a complex world*. New York: McGraw-Hill.
- Sterman, J. D. (2001). System dynamics modeling: tools for learning in a complex world. *California Management Review*, 43(4), 8-25.
- Stringer, E. T. (2008). *Action research in education*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Stringer, E. T. (2013). *Action research*. Thousand Oaks, CA: Sage Publications.
- Thiollent, M. (2011). *Metodologia da pesquisa-ação [Action Research Methodology]* Sao Paulo, Brazil: Cortez.
- Thomas, J. W. (1999). *Project based learning: A handbook for middle and high school*

- teachers*. Novato, CA: Buck Institute for Education.
- Wolstenholme, E. F., & Coyle, R. G. (1983). The development of system dynamics as a methodology for system description and qualitative analysis. *Journal of the Operational Research Society*, 34(7), 569-581.
- Wright, K. N., Williams, P., Wright, S., Lieber, E., Carrasco, S. R., & Gedjeyan, H. (2011). Ties that bind: Creating and sustaining community-academic partnerships. *Gateways: International Journal of Community Research and Engagement*, 4(1), 83-99.
- Yin, R. K. (2015). *Qualitative research from start to finish*. New York, NY: Guilford Publications.
- Zlotkowski, E. (1998). *Successful service-learning programs: New models of excellence in higher education*. Bolton, MA: Anker Publishing Company.

Appendix 1

PBL course overview

Week	Theory taught in class	Students assignments
1	Course overview: introduce the concepts of CBL and PBL, course objectives, evaluation process, the project themes.	Project theme chosen, URL established for project's blog, and appointment set with CP.
2	Present the concepts of project management. Explain how to create a project charter.	Meet with CP to clarify the project's scope. Create project charter and upload to the project's blog.
3	Present concepts of project planning. Explain how to create the project's Work Breakdown Structure (WBS). Introduce project network of activities and the critical path method (CPM).	Create the project's WBS, project network of activities and upload to the project's blog.
4	Discuss the different fundraising strategies.	Create fundraising strategy and upload to the project's blog. Prepare the project's status report presentation.
5 and 6	Focus group activity: the students present the status of their project and project blog, reflecting on what they have learned.	Upload the project's status report presentation to the project's blog.
7	Discuss the concepts of responsibility matrix. Explain how to create a project communication plan.	Create the project's communication plan and upload to the project's blog.
8	Explain how to create a project risk management plan.	Create the project's risk management plan and upload to the project's blog.
9	Present the concepts of project control and earned value analysis (EVA).	Create the project's EVA and upload to the project's blog.
10	Discuss how to create a project quality management plan (PQMP).	Create the PQMP and upload to the project's blog.
11	Explain concepts of project dynamics. Develop a grouping drawing activity in order to create a causal loop diagram representing the dynamics of each student's project.	Upload the drawing created during the group drawing activity to the project's blog.
12	Discuss conflict management and different strategies to cope with the conflicts. Offer	Create the CMR and upload to the project's blog.

guidance to
 create a conflict management report.

13	Review final presentation requirements, including the completion questionnaires and needed corrections to the students' blogs and project documents.	Students complete questionnaires.
14 and 15	Focus group activity on the final status of all projects and blogs, with students reflecting on they have learned. Community partner evaluations offered and final project evaluations discussed.	The students update the blogs and upload the final version of all documents.

Appendix 2

Courses, number of students per course, number of projects accomplished.

Semester/Year	Number of courses	Number of students/course	Number of projects
Second semester 2014	2	Course 01/ 13 students Course 02/ 36 students	8
First semester of 2015	2	Course 03/ 27 students Course 04/ 48 students	16
Second semester of 2015	4	Course 05/ 42 students Course 06/ 24 students Course 07/ 13 students Course 08/ 18 students	23

First semester of 2016	4	Course 09/ 7 students Course 10/ 42 students Course 11/ 11 students	16
Second semester of 2016	2	Course 12/ 28 students Course 13/ 19 students	10
First semester of 2017	3	Course 14/ 22 students Course 15/ 24 students Course 16/ 5 students	9
Total	19	379 students	82

Appendix 3

Students' major undergraduate area of study (Source: Enrollment lists)

Undergraduate major	Number of students of each major
Economics	247 students
Accounting	83 students
Administration	30 students
International relationships	15 students

Appendix 4

The community partners main activities and distance to the university

Community partner	Community partner's main activities	Distance to University
<i>Non-Governmental Organizations</i>		

1.	Claretianos	Provides educational and recreational activities to children and teenagers from poor communities.	22 KM
2.	Associação Cristã Caminhos da Verdade [Christian Association Paths to Truth]	Provides support (food, clothes, medicines) to elders and pregnant women from poor communities. Provides educational and recreational activities to children from those communities.	15 KM
3.	Grupo Ação, Assistência e Integração Social [Group Action, Assistance and Social Integration]	Provides educational and recreational activities to teenagers from poor communities.	5 KM
4.	Grupo Luz [Group Enlightenment]	A nursing home that provides full time assistance (food, shelter, medicine, clothes) to elders from poor families.	36 KM
5.	Casa Assistencial Amor e Esperança [Assistencial House Love and Hope]	Provides full time assistance (food, shelter, medicine, clothes) to children with cancer and non-contagious diseases.	17 KM
6.	Comunidade de Impacto [Impact Community]	Provides educational and recreational activities to children and teenagers from poor communities.	7 KM
7.	Herdeiros do futuro [The heirs of future]	Provides psychological support to children victims of sexual abuse.	29 KM
8.	Lar São José [Saint Joseph Home]	A daycare that provides food, play and educational pre-school activities to infants, toddlers and older children from poor families in nearby neighborhoods.	25 KM

9.	Unidade para reabilitação de deficientes visuais [Unit for rehabilitation for visually impaired]	An institution that provides support to people who are blind or have severe vision problems.	20 KM
10.	Instituto História Fazendo História [Making History Institute]	An institution that provides support to a network of orphanages.	16 KM
11.	A gente ajuda [We help]	An institution that provides food to the homeless.	24 KM
12.	Toca do estudante [Students' nook]	An institution that provides shelter, food, educational opportunities to students from poor families.	9 KM
13.	Instituto de longa permanência de idosos [Institute for long-term care of the elderly]	A nursing home that provides full time assistance (food, shelter, medicine, clothes) to elders from poor families.	36 KM
14.	Associação nipo-brasileira [Japanese-Brazilian Association]	Provides educational and recreational activities to teenagers from poor communities.	84 KM
15.	Assistência social de Cotia [Social assistance from Cotia]	A nursing home that provides full time assistance (food, shelter, medicine, clothes) to elders from poor families.	30 KM
16.	Associação viver melhor [Having a better life association]	Provides educational and recreational activities to children and teenagers from poor communities.	30 KM
<i>Public institution</i>			
17.	Centro de Convivência e Cooperativa Ibirapuera [Ibirapuera's Convivence Center and Cooperative]	A public institution that provides recreational and artistic activities to people with mental problems.	20 KM
<i>Hospital</i>			
18.	Santa Casa de Misericórdia [Holy House of Mercy]	Hospital that provides assistance to people in need.	21 KM
<i>University's Library</i>			
19.	Biblioteca da Unifesp [Unifesp's library]	Provides books and courses to university students and to members of the nearby neighborhoods.	0 KM
<i>Community members</i>			
20.	Família em necessidade [Family in need]	An unemployed cleaning clerk who needed clothes, food and a cradle for her baby.	5 KM

Appendix 5

The open-ended questions

1. What was the institution you chose? What motivated you to choose this institution?
 2. What was the product or service you created on behalf of this institution?
 3. How did you organize yourselves? (team's roles and responsibilities)
 4. Did your project demand fundraising activities? If so, what was the strategy used to raise funds?
 5. What were the main problems you faced during the project? How did you solve these problems?
 6. What were the main lessons (positive and negative aspects) you learned doing the project?
 7. How did you manage conflicts?
 8. What would you do differently, if you were going to do the same project again?
 9. Tell me what you have learned by working in a real-life project, interacting with the community partners.
 10. Tell me which concepts studied in our course that you have applied in the project.
 11. What advice you should give to the future students about this course?
 12. How was your relationship with the community partner?
 13. Was the product or service created delivered following your plan? If not, what were the causes of the delays?
 14. What else would you like to report?
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Appendix 6

Number of projects per community partner (Source: Course website)

Community partner	Number of projects
<i>Non-Governmental Organizations</i>	
1. Claretianos	11
2. Associação Cristã Caminhos da Verdade [Christian Association Paths to Truth]	9
3. Grupo Ação, Assistência e Integração Social [Group Action, Assistance and Social Integration]	8
4. Grupo Luz [Group Enlightenment]	7
5. Casa Assistencial Amor e Esperança [Assistencial House Love and Hope]	7
6. Comunidade de Impacto [Impact Community]	7
7. Herdeiros do futuro [The Heirs of the Future]	5
8. Lar São José [Saint Joseph Home]	4

9. Unidade para reabilitação de deficientes visuais [Unit for rehabilitation for visually impaired]	4
10. Instituto Fazendo História [Making History Institute]	3
11. A gente ajuda [We Help]	1
12. Toca do estudante [Students' Nook]	1
13. Instituto de longa permanência de idosos [Institute for Long-term Care of the Elderly]	1
14. Associação nipo-brasileira [Japanese-Brazilian Association]	1
15. Assistência social de Cotia [Cotia Social Assistance]	1
16. Associação viver melhor [The Better Life association]	1
<i>Public institution</i>	
17. Centro de Convivência e Cooperativa Ibirapuera [Ibirapuera's Convivence Center and Cooperative]	1
18. Santa Casa de Misericórdia [Holy House of Mercy]	2
<i>University's Library</i>	
19. Biblioteca da Unifesp [Unifesp's library]	7
<i>Community members</i>	
20. Família em necessidade (Family in need)	1
Total number of projects	82

Appendix 7

Products and services created (Source: student questionnaires and project documents)

Project categories (and the number completed)	Products and services
Equipment acquisition (23)	Baby strollers, food mixers, shelves, printer, ink, churns, mixers, liquefiers, party materials, pans, baby diapers, adult diapers, infant car seat, drinking glasses, security cameras and cables, floor markings for blind, LED light bulbs, electric stove, 250 booklets about sexual violence, plastic storage containers, casserole, trays, mugs, pots, cauldrons, industrial stove, braille index card slate, crutches, baby clothes.

Food acquisition (11)	Hundreds of kilograms of fresh food and non-perishable food (milk, soy oil, pasta, candies, rice, beans, meat, vegetables, soup, coffee, etc.)
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Small repairs (8)	Painting of various rooms, installation of floor markings for the blind, creation of suspended garden, remodelling of reading room.
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Information of technology developments (8)	Website development, database development, library's software database customization, logo development, customization of financial software.
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Acquisition of toys and clothes (8)	Soccer materials, table tennis table, clothing, 634 toys, 300 comic books, donation of clothing to elders.
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School material acquisition (7)	A4 reams, pencils, pens, 100 schoolbooks, chalk, printing of classroom handouts.
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Organization of working spaces (7)	Files organization, small library organization, library's support project
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Creation of small libraries (5)	Acquisition of 1,774 books and book exchange fair.
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Hygiene material acquisition (4)	150 hygiene kits (shampoo, toothpaste, toothbrush, soap, toilet paper), 80 oral hygiene kits (toothbrush, dental floss, toothpaste), detergent, bleach.
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Activities with children (3)	Play activities with children.
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Activities with elders (2)	Music show to elders, play activities.
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Creation of videos (1)	Videos explaining library services and tools.
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Research activities (1)	Creation of database about children and teenager in vulnerable conditions.
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Marketing campaign (1)	Campaign to publicize library services.
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