

PARTICIPATORY METHODOLOGY, FROM INDUCTION TO RESEARCH, FOR ACADEMIC AND SOCIO-CULTURALLY DISADVANTAGED COLLEGE STUDENTS

Metodología participativa, de la inducción a la investigación, para estudiantes universitarios y socioculturalmente con desventajas

 **Rodrigo Ramirez-Tagle¹**
rodrigo.ramirez@uac.cl

 **Claudio Ruff²**
cruff@ubo.cl

 **Jaime Ocaranza-Ozimica³**
jaime.ocaranza@gmail.com

¹ Universidad de Aconcagua, Chile

² Universidad Bernardo O'Higgins, Chile

³ Teveuci Home Care, Chile

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Abstract

To improve the performance of academic and socio-culturally disadvantaged students using a learning strategy based on a mediated tutorial e-MEIK (evaluation model integrated into the Kinesiology program), from induction to research, in an undergraduate program (physical therapy) at Universidad Bernardo O'Higgins, a socially inclusive university located in Santiago de Chile. The learning strategy focuses on different research goals to be developed by students and was implemented due to the poor academic results of the first-year students. This model, with 267 student participants, used Problem-Based Investigation (PBI) where each group integrated the subjects they studied together with their professional reality into a final essay and a video. Comparing the students' pass rates in each academic year (2010-2012) there was a significant improvement ($p < .001$) showing that students with educational deficiencies at the university entry level can improve their learning strategies and academic achievement. The learning strategy encouraged motivation, achieved specific goals, and impacted students' performance as well as the development of their own abilities. It was also possible to improve their reading skills, time management, creative potential, and spontaneity to overcome obstacles.

Keywords: academic achievement, collaborative works, diversity, disadvantaged students, learning strategy.

Resumen

Mejorar el desempeño de estudiantes académicos y socioculturalmente desfavorecidos utilizando una estrategia de aprendizaje basada en un tutorial e-MEIK (modelo de evaluación integrado en el programa de Kinesología), desde la inducción hasta la investigación, en un programa de pregrado (fisioterapia) en la Universidad Bernardo O'Higgins, una universidad socialmente inclusiva ubicada en Santiago de Chile. La estrategia de aprendizaje se enfoca en diferentes objetivos de investigación a desarrollar e implementar por parte de los estudiantes debido a los malos resultados académicos de los estudiantes de primer año. Este modelo, con 267 estudiantes participantes, utilizó la Investigación Basada en Problemas (PBI) donde cada grupo integró las materias que estudió con su realidad profesional en un ensayo final y un video. Resultados: Al comparar las tasas de aprobación de los estudiantes en cada año académico (2010-2012), hubo una mejora significativa ($p < .001$), que demostró que los estudiantes, con deficiencias educativas a nivel de ingreso a la universidad, pueden mejorar sus estrategias de aprendizaje y rendimiento académico. La estrategia de aprendizaje fomentó la motivación, logró metas específicas e impactó el desempeño de los estudiantes, así como el desarrollo de sus propias habilidades. También fue posible mejorar sus habilidades lectoras, manejo del tiempo, potencial creativo y espontaneidad para superar obstáculos.

Palabras clave: rendimiento académico, trabajos colaborativos, diversidad, estudiantes desfavorecidos, estrategia de aprendizaje.

Introduction

University teaching has been an ongoing challenge for academics, both trainers and students who expect their teachers to use up-to-date training available to enable them to develop in all areas of their lives. Immature students look for inclusive universities, allowing for the development of new approaches that enhance third level educational models. In this way, the Universidad Bernardo O'Higgins (UBO) focuses the learning process on the student through its training model, changing the paradigm centered on teacher education to another that is focused on learning where the student is the center. Both the objectives and the results of teaching use technological tools and methodological changes in the teaching-learning process for professional development. Carlino (2005) raised the difficulty observed in traditional teaching, regarding its structure, stating that in the usual configuration of teaching, the teacher is the learner, as they experience the most cognitive activity.

Because of this, in 2010 we developed an educational model implemented in line with the university model to improve the academic performance of Kinesiology students (Physical therapy) in the Universidad Bernardo O'Higgins. This new learning strategy was implemented from induction to research for academically and socio-culturally disadvantaged students in the Kinesiology Undergraduate Program at Universidad Bernardo O'Higgins, which is a socially inclusive university located in Santiago de Chile. The learning strategy was based on mediated tutorials called e-MEIK, an evaluation model integrated into

the Physical Therapy Program, to improve the poor academic results of first-year students.

We used Problem-Based Investigation (PBI) to work with groups of students who integrated the subjects they studied at the university with their professional reality in order to propose different research goals and development during the creation of a progressive and permanent practice to "praxis research" (Díaz, 2011) in their curriculum processes (Ertmer et al., 2009; Lewis et al., 2009; Skelin et al., 2008; Strobel & van Barneveld, 2009; Tambouris et al., 2012).

Higher education no longer has the connotation of being the "Skill formation Level" as it is growing and expanding with the progressive incorporation of young people from low socioeconomic levels, many of whom are the first generation of their families to access this type of training and who belong to groups that were traditionally excluded and marginalized from this educational alternative (Heisserer & Parette, 2002).

As seen in Table 01, compared to the number of third level students, which increased by 53% worldwide (150 million) between 2000 and 2010 (Altbach, 2013), the expansion rate in Chile was 161% from 452,325 to 1,184,464 students during the same period. It is important to note that in the case of the countries belonging to the Organization for Economic Co-operation and Development (OECD), which includes the 34 most developed countries in the world and accounts for 80% of global GDP, the growth rate of enrollment was 25% in a rather longer period from 1995 to 2010.

Table 1.: Evolution of the Higher Education System in Chile

Enrollment	2000	2013	Variation
			2000 - 2013
Total	452,325	1,184,464	161%
Certificated	46.67	179,008	183%
Non-Graduated Enrollment	435,884	1,114,299	155%
Population 18 to 24 years old (INE)	1,679,884	2,056,374	22%
TE Coverage	26.9%	57.6%	113,9%

Source: MINEDUC

Although these numbers represent an advance in terms of the democratization of the access to tertiary education, the fact is that the number of students who remain in the system and finally complete their studies is very low. The factors that influence this situation are varied, namely, duration of the academic programs, economical or vocational problems, feeble

previous academic preparation, students with social integration problems, lack of study methods, among others. By analyzing the duration of the programs, we can see that a student takes on average 8.6 years to complete his or her studies at university, 6.4, and 4.6 years in a professional institute and technical training center, respectively (see Table 2).

Table 2. Formal and Real duration of programs

Institutions	Formal Duration (Semester)	Real Duration (Semester)	Gap
University	8.6	12.9	4.3
Professional Institute	6.4	9.3	2.9
Technical Training Center	4.6	7.2	2.6

Source: Institutional Data Base

Retention and graduation figures are difficult to compare between countries but if we take as a benchmark the average graduation rate in the OECD, which is 39%, Chile is around 24%, very close to the 25% of Mexico, Saudi Arabia and Turkey, but far from the 50% found in Australia, Denmark, Iceland, Poland and the UK (OECD, 2013). In the case of the Universidad Bernardo O'Higgins, which I represent, the average graduation rate is 34% (Canales & Ríos, 2009).

In Chile, another important factor is the issue of equal access to education. This is manifested through the constant tensions within the higher education system, highlighted by the massive student demonstrations in 2006 and 2011. Equity was the central topic of the report "Higher Education in Chile" (OECD, 2009). While the educational reform of 1981 allowed massive access to higher education and moved from a coverage rate of 8% to 50% today, the fact remains that this was accomplished through a massive entry associated with an excessive and unregulated privatization of the education system including an increasingly distant participation of the state in policies and control.

The existence of a significant body of state universities marks the presence and role of the state in this type of training. However, the level of extension related

to technical professional training is almost exclusively in private hands today. Many of these private institutions have no or low accreditation and high dropout rates. Finally, another aspect that is putting pressure on the Chilean system today is related to the segregation of education, since the mechanisms to access higher education such as standardized tests, are regressive instruments and unreliable predictors of success in training. There is a saying in Chile related to this: "Tell me where you were born and I will tell you how much you will earn." (Muñoz & Redondo, 2013).

We know that those entering higher education and successfully managing to finish it, experience a radical change in their personal and family circumstances, where it creates greater opportunities, job recognition and better salaries. We have encouraged the noble challenge to continue designing strategies to facilitate inclusiveness further and improve our graduation rates, thus overcoming some of the factors that are influencing the frustration of many students and their households in the social realities we face. In the case of Chile, the evidence shows a difference in income between those who have had access to higher education versus those who did not, thus, to the extent that increased years of schooling, significantly increases the income levels of individuals. Some of

these individuals can even quadruple their income after accessing university education.

In the general context described, the Universidad Bernardo O'Higgins is a non-profit private foundation, that deals with the deprived segments of the population in terms of availability of resources for higher education, clear orientation towards "inclusiveness" and "social promotion" inspired by solid principles and values, respect for people's dignity, the recognition of merit, the spirit of service, the sense of freedom and a sense of ethics, among others.

In general, work is centered on students, who are subject to comprehensive training and appropriate programs to reinforce their progress according to the skills, merits, and efforts. For this, the university has created conditions to fulfil its mission through a set of measures and instruments that enable the efficient development towards the generic skills of the graduate profile of each student, achieving, in addition to professional integrity, a compromise with the principles and values that the university promotes, and which are accompanied by capabilities to present and defend ideas.

This situation has led our university to become a tertiary education institution responsible for hosting youths lacking proper prior education and vulnerable training for their original socio-economic status and to develop supporting programs to help strengthen their entry competencies at this education level. Thus in 2010, along with the creation of the Kinesiology Program in the Health Faculty at our university, we launched a pilot project called e-Meik (Evaluation Model Integrated into Kinesiology) as part of a strategy to improve the academic performance of students.

This learning strategy is based on mediated tutoring, where students from the second semester must propose different research goals to be developed over their college education. This program includes the development of different skills, stimulates the capacity for teamwork and a progressive increase in autonomous learning, and seeks to relate their initial research with the main topics of the courses taken

throughout their program, which is accompanied throughout by a tutor (Diaz, 2011).

Methods

The Kinesiology Program at the Universidad Bernardo O'Higgins generated a project associated with teaching, in July of 2010, under the name Model of Integrative Evaluation in Kinesiology known as its initials in Spanish (e-MEIK). The main strategy of this tool was to create a progressive and permanent practice of "praxis research" (Diaz, 2011) in undergraduate students, ranging from their initial induction until the publication of papers in journals in the field of health and conference participation during their undergraduate training (Ertmer et al., 2009; Skelin et al., 2008).

Its methodology based on progressively structured content integration in group format in 5 levels, starting with level I of induction based on research groups with different levels of performance and learning styles, associating health issues with the subjects of the second semester, going on to level II in the fourth semester where each group must submit a pre-research proposal. At level III (fifth semester) students are asked to submit a proposal to research health journals and conferences and then at level IV (seventh semester) they should resolve the modifications received by the different committees, achieving the publication of their work, evaluated with rubrics for each level. Finally, their thesis proposal is developed in level V (eighth semester) in the last e-MEIK subject.

All of the above are based on Problem-Based Investigation or PBI (Skelin et al., 2008) allowing students to facilitate the fulfilment of the program's graduate profile, through the use of technology associated with teaching, integrating semi-annual content, and closeness with students, supported with the strategy of semi tutorials (Strobel & van Barneveld, 2009), which grant them a global view of knowledge, stimulating their proximity to issues about prevention and health promotion, from the first to the fifth year of their university education.

In short, this strategy seeks to improve students' academic performance, facilitating the transition from research projects to the pre-publication of final research papers in specialized journals by submitting them in national and international conferences.

The main innovations of the model are:

To develop collaborative work between different groups of students with diverse learning styles and academic performances during the first four years of their training.; work based on ICT, by using the UBO-TV channel in the first year of the e-MEIK to record their proposals; use of technology by teachers and tutors, by recording the progress of the process in the first and second years via e-learning on the UBO-TV channel, during the first three years; involve teachers from 33 subjects from the Kinesiology Program in the support during the semester to strengthen research projects as a percentage of their

evaluations at the end of each semester, in the five years of their formation.

Finally, demonstrate that students from disadvantaged socio-economic and cultural levels are capable, with proper guidance and motivation, of innovating in the field of health.

Results

To study the first level (e-MEIK I) in the second semester, we measured a representative sample of 267 freshmen from the years 2010 to 2012, who entered the university as regular students by 2013 (corresponding to a 62.09% of the total population). A sustained improvement in the students' academic performances in first year cohorts 2010 – 2012 was observed, comparing their pass rates between fall and spring subjects for those mentioned years (see Table 3).

Table 3. Percentages of approval by cohort (2010 – 2012)

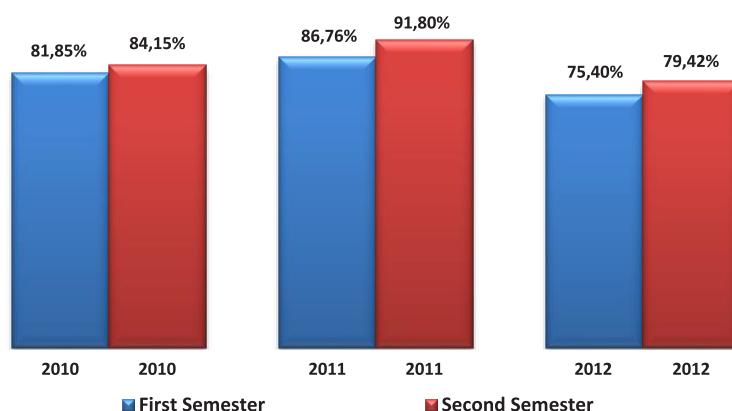
Year Enrolled	First Semester		Second Semester		Total	
	Average	Std. Dev.	Average	Std. Dev.	Average	Std. Dev.
2010	81.85%	19.55%	84.15%	16.25%	83.00%	17.95%
2011	86.76%	18.94%	91.80%	16.46%	89.28%	17.88%
2012	75.40%	25.23%	79.42%	22.04%	77.41%	23.71%
Total	81.46%	21.96%	85.39%	19.23%	83.43%	20.71%

Source: Institutional Database 2010 – 2013

Graph 1 shows the comparison of approval levels of the first and second semester, differentiated by entering cohorts 2010, 2011 and 2012. We observed that in general, the passing rates were always higher in

the second semester (semester with e-MEIK I) with respect to the first (2.30%, 5.04% and 4.02% for 2010, 2011 and 2012, respectively).

Graph 1. Comparison levels of approval according to cohort 2010 – 2012

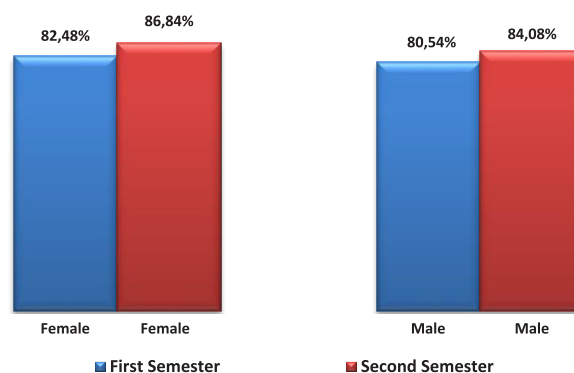


Source: Institutional Data-Base 2010 - 2013

Regarding the comparison of gender, Graph 2 shows the levels of general approval in percentage differentiated by gender. We observed a higher percentage of general approval in the second semester (with e-MEIK), compared to the first (no e-MEIK), in both sexes. However, when comparing students' performances by gender, women performed better in both semesters (1.94% and 2.76% in the first and second semester, respectively).

As seen in Table 04, it is possible to demonstrate a significant difference between the 99% approval ratings, always being higher in the second half (with e-MEIK I) and with a difference between 1.81% and 6.04% between the two semesters ($p < .0001$).

Graph 1. Comparison levels of approval according to first – second semester, by gender



Source: Institutional Database 2010 – 2013.

Table 4. Comparison of related samples with significant differences to 99% of confidence”.

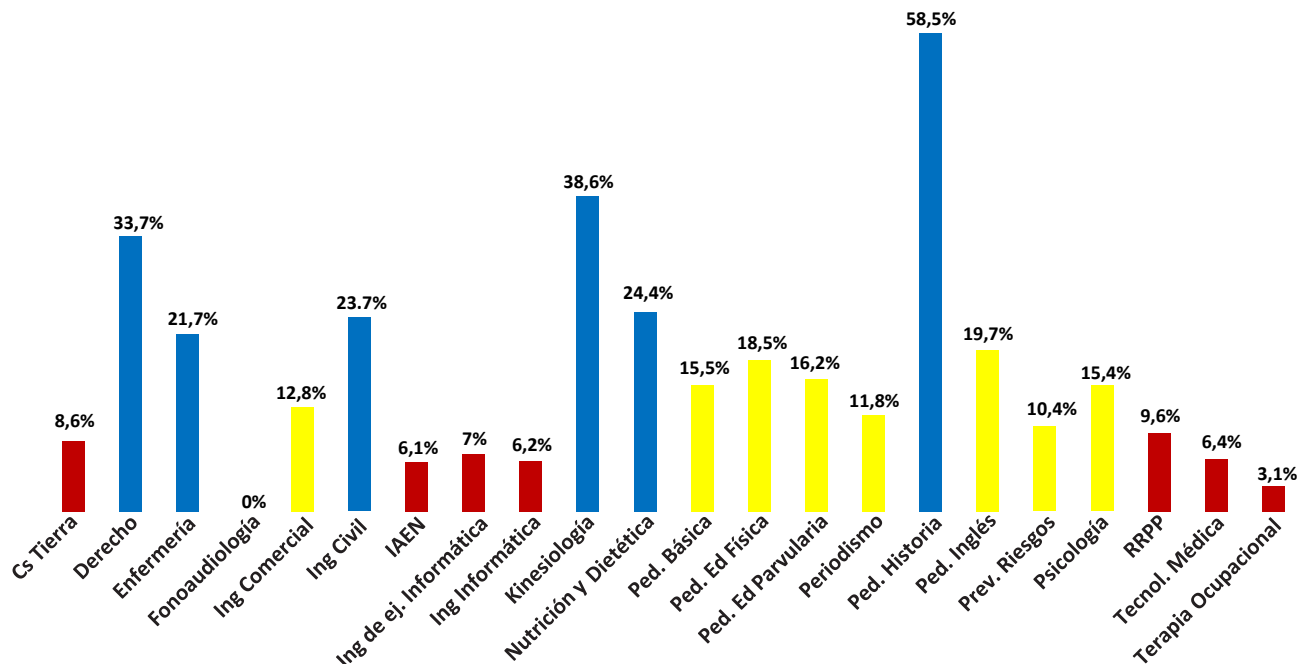
	Related Difference					t	Degrees of Free- dom	Signifi- cance (bi- lateral)
	Mean	Standard Deviation (Std. Dev.)	Standard Error of the Mean (SEM)	99% Confidence interval for the difference				
				Lower limit	Upper limit			
Difference in ap- proval first and second semester	0.03926	0.133278	0.008156	0.018093	0.060416	4.813	266	0.0000

Source: Institutional Data-Base 2010 – 2013.

Graph 3 demonstrates the positive effect of the project on the use of books, where in 2012 the Kinesiology Program showed an average of 38.6% of book

loans from the library, second only to Pedagogy in History.

Graph 3: Average book loans for students, 2012.

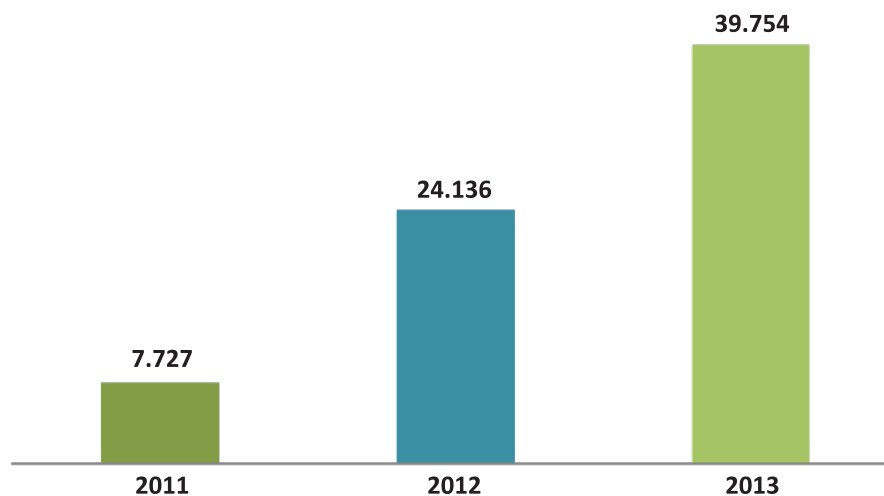


Source: Directions Bibliotheca UBO.

This is consistent with the increasing use of databases. Graph 4 shows that consultations increased 212% in the EBSCO platform (7727 – 4136 queries), which coincides with the advance from level II to level III (2011 – 2012) where present research proposals were associated with undergraduate teaching. Moreover,

the same basis increased by 414% from 2011, which coincides with the transition from level IV to level V of this model, where students submit their projects to journals and specialized conferences, finishing the e-MEIK course (eighth semester).

Graph 4. Improvement in EBSCO database 2011 – 2013



Source: Address Library UBO.

Discussion

The results demonstrate that it is possible to achieve adequate levels of performance in university freshmen after three years of follow-up, which is outstanding considering that classrooms are frequently used by students of different ethnicities, races, sub-cultures, age groups, socioeconomic strata and various educational records (Contreras et al., 2009). This makes it necessary to develop strategies to strengthen academics in a scenario that gives young university students common benefits, more confidence and consistency, both in areas of language, social recognition and empowerment, which allows them to be part of their social environment or social leap among peers (Cox, 2007), while stimulating their interests and needs in their professional transformation.

These collaborative ways to meet new challenges are directly associated with both facing learning problems and developing strategies to overcome the difficulty by pre-university training centers. This has been validated with many examples such as the baccalaureate programs to apply to study medicine at the University of Queensland, which incorporated a tutorial system to facilitate Problem-based Investigation (Ponte 2013). In these tutorials, importance was given to the students' 'monitoring support' centered on PBI, which, according to the authors, is achieved when learning "is mediated by another person, with a predominant structure of learning supported by the process of communication" (Lewis et al., 2009)

The link that apparently needs to be built is related to the various measurement strategies of learning that become part of students' academic lives. If it is shared between teacher and student, it favors their motivation, the teaching-learning process, autonomy, and responsibility, among others, because various types of learning have varied origins.

Conclusions

Choosing to develop workshops and tutorials, based on PBI, promotes motivation and achievement of specific goals and objectives, to generate "investigative praxis". This impacts both performance and the

awakening of the student's own abilities, knowledge, skills and attitudes required to face the professional world.

This project enables better decision-making in all areas of the students' development. Being clear that these are some of the variables of this phenomenon, it is important to investigate the students' position as people in a social environment, investigating their personal characteristics, motivation to study, interests, or determination to learn, among other situations, permanently stimulating collaborative and participatory work of undergraduate health students. Indeed, this methodology encourages motivation, achievement of specific goals and has a strong impact on the students' academic performance as well as the development of their own abilities. It also improves reading skills, time management, creative potential, and spontaneity to overcome obstacles. Comparing students' pass rate results in each academic year (2010 – 2012), there was a significant improvement (99% confidence interval), showing that students with inadequate study skills at university entry level can improve their learning strategies and academic achievement.

Based on the above, the e-Meik project was a successful program that provides young university students with academic benefits, along with more confidence seen in both areas of language, social recognition and empowerment. It allows them, along with the rest of the programs supported by the university, to be part of their environment or social leap, favoring the transfer of knowledge and resources that generate positive benefits for students. This is consistent with the inclusive role of the university, and points to an improvement in the levels of on-time graduation rates, without neglecting quality, thoroughness and commitment with future professionals.

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