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# IMPLICATION OF THE LEARNING MODEL BASED ON COLLABORATIVE PROJECTS IN THE UNIVERSITY CONTEXT

# IMPLICACIÓN DEL MODELO DE APRENDIZAJE BASADO EN PROYECTOS COLABORATIVOS EN EL CONTEXTO UNIVERSITARIO

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**ABSTRACT**
Collaborative learning consists in the realization of team-work where social, personal and professional skills are practiced. This article represents the results of an opinion survey that we realized with 96 students from some Ecuadorian Universities in December in 2016. This survey deals with aspects that are connected with collaborative teaching techniques at classrooms. The article also contains a brief revision of different learning models. The results show that the application of this teaching system in high education is problematic for some students. However more than 60% of the survey respondents admitted that team-work may help then in their future profession. Furthermore they acquired more knowledge through this way of learning.

**KEYWORDS:** collaborative learning; Group work; Higher education; learning Methods; significant learning; Learning Systems; Applied research.

**RESUMEN**
El aprendizaje colaborativo promueve la enseñanza mediante la ejecución de trabajos en grupo, en cuyo proceso se pone en práctica habilidades sociales, personales y profesionales. Este artículo presenta los resultados de una encuesta de opinión realizada a 96 estudiantes de universidades ecuatorianas en diciembre de 2016. La encuesta trata de aspectos relacionados al aprendizaje basado en proyectos colaborativos y su aplicación en las aulas de clase. Este artículo también contiene una breve revisión acerca de los diferentes modelos de aprendizaje. Los resultados muestran que la aplicación de este sistema de aprendizaje en la educación superior

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es problemático para algunos estudiantes. Sin embargo, más del 60% de los encuestados admite que el trabajo en grupo puede ayudarles en su futura profesión; además, ellos adquieren más conocimientos a través de esta manera de aprendizaje.

**PALABRAS CLAVE:** Aprendizaje colaborativo; Trabajo en grupo; Educación superior; Métodos de aprendizaje; Aprendizaje significativo; Sistemas de aprendizaje; Investigación aplicada

## IMPLICAÇÃO DO MODELO DE APRENDIZAGEM BASEADO EM PROJETOS COLABORATIVOS NO CONTEXTO UNIVERSITÁRIO

O aprendizado colaborativo promove o ensino mediante a execução de trabalhos em grupo, cujo processo põe em pratica habilidades sociais, pessoais e profissionais. Este artigo apresenta os resultados de uma encosta de opinião realizada a 96 estudantes de universidades equatorianas em dezembro de 2016. A encosta trata de aspectos relacionados ao aprendizado baseado em projetos colaborativos e sua aplicação nas classes de aula. Este artigo também contém uma breve revisão dos diferentes modelos de aprendizagem. Os resultados mostram que a aplicação deste sistema de aprendizagem na educação superior é problemática para alguns estudantes. Sem embargo, mais de 60% dos entrevistados admite que o trabalho em grupo pode ajudá-los em sua futura profissão, ademais, eles adquirem mais conhecimentos através desta maneira de aprendizagem.

**PALAVRAS CHAVE:** Aprendizagem colaborativa – Trabalho em grupo – Educação superior – Métodos de aprendizagem – Aprendizagem significativo – Sistemas de aprendizagem – Investigação aplicada.

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## 1. INTRODUCTION

The complex business environment, characterized by strong competitiveness in all areas, requires mainly the development of professionals whose knowledge, skills, abilities, qualifications and competence entail a strategic asset that provides a competitive advantage to the organization.

From the academic point of view, higher education institutions are responsible for training individuals as competent individuals and professionals, that is, qualified

professionals who can meet the demands of the labor market and requirements of society in general.

Likewise, each year the number of people enrolled in universities and technical institutes increases, aware that higher education will turn them into a more competitive workers, cooperating in the development of the company and increasing their "value as an asset" in the labor market.

This panorama demands the adaptation of the educational system towards a new teaching-learning model, where students and teachers not only focus on the sessions of theoretical classes but also understand the solution of problems close to the reality that surrounds them, the same ones that will contribute to create new knowledge.

The pedagogical success will fall, therefore, on the ability of the teacher to combine different didactic techniques necessary to guide the student's learning, at the same time that pursues the achievement of the results that are expected to be achieved during the academic year. However, the techniques to be applied, as well as the activities that comprise them, must be defined according to the learning needs of the group of students whom the teaching staff target.

The need to also have individuals who know how to work as a team, listen, respect opinions and seek to solve problems in a group has encouraged the application of collaborative learning models, where the interaction among people favors the development of personal and social skills, also achieving to increase learning of all the students.

## 2. LEARNING MODEL

Management of teaching strategies requires the teacher to master numerous techniques that allow students to acquire significant learning, where they no longer resort to the memorization of information but to its analysis, understanding, criticism and application, modifying the preexisting cognitive structure of the individual (Ausubel, 2002)

This is compounded by the complexity of using technologies in the learning system, so that it contributes to professional training. However, for its use as a didactic tool it is necessary to plan activities adapted to the technological context so present today.

The phenomenon of the digital age and its application in education has led the academic world to take an interest in the subject, resulting in numerous studies that declare that: one of the strengths of the use of digital tools and the creation of learning ecosystems is the use of collaborative work methodologies (Lavrin & Zelko, 2005); development of individual and collaborative knowledge construction (Osorio & Duart, 2011) ; predisposition to the use of digital media in the learning process by university students (Espuny, González, Lleixa, & Gisbert, 2011) ; it requires the collaboration and commitment of all those who make up the new network society (De-Juanas & Diestro, 2012)

This new way of teaching has modified the traditional procedures teachers used in classrooms, now choosing self-regulated strategies, more flexible and adapted to the

environment, to encourage significant learning in students. This has provided studies on the use of technological tools in the collaborative learning process (Resta & Laferrière, 2007) and (Sloep & Berlanga, 2011).

This approach is related to the so-called "experiential learning" developed by Dewey (1938; (Daudelin, 1997) ), who defends educational experience as an aid to form thought, and where the theoretical part of the academic formation is put into "practice". Likewise, this experience prepares the student for later experiences of a deeper and wider quality, since it confronts him with real problems, develops researcher skills, confronts social situations, learns to collaborate, applies and transfers knowledge, among others.

Similarly, "project-based learning" (Blumenfeld, et al., 1991) and (Hmelo-Silver, 2004) defends the use of "problems" as a strategy for students to face a situation of real problems through the practical application of the concepts learned in the classroom, thus demonstrating their academic training. At the same time, this learning model favors the development of specific competences (skills and abilities, application of knowledge, decision making), methodological competences (cognitive strategies, mental abilities) and human competences (communication, collaboration, responsibility) in students.

As can be seen, independently of the didactic tool and the theories of learning, the terms "collaboration", "collaborate", or "collaborative" arise, which in this context refer to the joint performance of a task or work. This group learning suggests a more cooperative mode of teaching "where students share the meaning of their learning, cooperate with each other, support each other and engage in relevant and meaningful processes that help them motivate themselves, and this requires high-level cognitive and emotional skills" (McConnell, 2006)

(Salinas, 2004) establishes that collaborative learning should be understood as that learning process that "emphasizes cooperative or group efforts between teachers and students, and that requires active participation and interaction on the part of both, teachers and students, as compared to traditional models of cumulative learning"; while (Gros, 2009) qualifies that only through collaboration among all members of the working group can the level of learning be increased, they are also the ones who decide how to perform the task, what procedures to apply, the responsibilities of each member and how to distribute the work.

This requires both teachers and students, and the educational institution in general, to adopt a collaborative work culture, which promotes the transformation of teaching methodologies towards more practical, communicative and participatory approaches, maintaining the quality of the teaching contents. In addition, it is the teachers' responsibility to create the mechanisms that enable communication and feedback between teachers and students, and also among the members of each working group during the completion of the task.

## 3. METHODOLOGICAL DESIGN AND SAMPLE

The importance of knowing the opinion of university students towards the application of collaborative learning models in classrooms motivated researchers to conduct a poll on the use of collaborative work in classes and their perception. This is

an opinion poll consisting of 14 items with closed questions that, using a Likert scale with five levels of agreement / disagreement, measured, among other things: the intention to work in groups, communication, consolidation of knowledge, development of skills, level of conflicts and effectiveness.

This work is of a strong quantitative-qualitative character as it collects information and data and, subsequently, performs a statistical analysis in order to try to understand and contextualize the data collected during two weeks of the last month of 2016. The polls were carried out through the use of the Google Docs collaborative tool (Kai-Wai Chu & Kennedy, 2011), and they lasted 5 to 10 minutes. The results of the Likert scale were processed through the frequency analysis and the application of the SPSS statistic.

Due to the difficulty of surveying the 562,473 students enrolled in Ecuadorian higher education institutions, according to the latest data from the (Secretariat of Higher Education, Science, Technology and Innovation - SENESCYT, 2014), we proceeded to determine the sample with 95% of reliability and 10% of percentage of error of sampling, the size of which includes 96 elements. The selection of the sampling elements was done randomly (Casal & Mateu, 2003) to their emails and they are students from different universities of Ecuador.

## 4. RESULTS AND ANALYSIS

After conducting the polls, university students from Ecuadorian educational institutions said that the technique of collaborative work is applied in classes in 97.9%. In turn, it is surprising that 44.8% of respondents recognized that it takes an effort to perform this type of group tasks.

Table 1 shows the perceptions of the students regarding collaborative work:

Table 1
*Frequency of student opinion*

| Questions | TA | DA | I. | ED | TD |
|---|---|---|---|---|---|
| 1. Do you receive motivation from teachers in achieving the objectives of collaborative work? | 14.6% | 44.8% | 20.8% | 19.8% | 0.0% |
| 2. Has collaborative work been stimulating in terms of social relationships? | 32.3% | 59.4% | 8.3% | 0.0% | 0.0% |
| 3. Has collaborative work contributed to increase your knowledge about the topic? | 31.3% | 64.6% | 3.1% | 1.0% | 0.0% |
| 4. Has collaborative work helped to solve the proposed problem more efficiently? | 41.7% | 52.1% | 6.2% | 0.0% | 0.0% |
| 5. Has collaborative work been developed through the establishment of roles in the working groups? | 66.7% | 29.2% | 3.1% | 1.0% | 0.0% |
| 6. Has the accomplishment of collaborative works contributed to the emergence of discrepancies among the | 72.9% | 13.5% | 7.3% | 5.2% | 1.1% |

| | | | | | |
|---|---|---|---|---|---|
| members of the working group? | | | | | |
| 7. Are the collaborative works proposed by the teachers related to the exercise of your future profession? | 18.8% | 64.6% | 13.5% | 3.1% | 0.0% |
| 8. Are the collaborative works proposed by the teachers related to the reality that surrounds you? | 8.3% | 69.8% | 20.8% | 1.1% | 0.0% |
| 9. Has participation in collaborative work groups increased your general knowledge? | 26.0% | 68.8% | 4.2% | 1.0% | 0.0% |

**Source:** Poll (2016)

Students show, with 72.9% on the scale of "totally agree", that there are disagreements in the execution of collaborative work, which may be due to establishing the roles of members in the groups, and which are established, according to respondents, by 66.7%.

In the "agreement" scale, we find that 64.6% detail that the accomplishment of collaborative tasks has contributed to acquire more knowledge about the work to be delivered. Also, 68.8% have increased their knowledge in general by participating in collaborative works.

64.6% also declare that the works are related to the exercise of their future work profession, as well as that 69.8% consider that said works have affinity with the reality that surrounds them. Also, thanks to this collaboration among those who make up the work groups, the activity has been solved efficiently, with 52.1%; likewise, 59.4% consider the emergence of social relationships in the performance of collaborative work to be comforting.

It is surprising that only 14.6% of students receive great motivation from their professors, even this percentage is lower than those who are "in disagreement" regarding the motivation they receive with 19.8%.

Table 2 shows the analysis of the correlations existing among the questions applied in the study:

Table 2

*Correlations of the components of collaborative work*

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| **1. Motivation** | 1 | | | | | | | | |
| **2. Social relationships** | , 520** | 1 | | | | | | | |
| **3. Knowledge** | , 322** | , 395** | 1 | | | | | | |
| **4. Problem solving** | , 318** | , 381** | , 526** | 1 | | | | | |
| **5. Establishment of roles** | -, 010 | , 051 | , 004 | , 272** | 1 | | | | |
| **6. Group discrepancies** | -, 131 | -, 154 | -, 090 | , 044 | , 481** | 1 | | | |
| **7. Future** | , 282 | , 428 | , 341 | , 323 | , 349 | , | 1 | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **profession** | ** | ** | ** | ** | ** | 111 | | | |
| **8. Current reality** | 146 | 169 | , 106 | , 155 | , 091 | , 047 | , 358 ** | 1 | |
| **9. Increase of knowledge** | , 228 * | 110 | , 318 ** | , 358 ** | , 071 | , 002 | 175 | , 229 * | 1 |
| ** The correlation is significant at the 0.01 level (bilateral). | | | | | | | | | |
| *. The correlation is significant at the 0.05 level (bilateral). | | | | | | | | | |

**Source:** Poll (2016)

The information evidences that many of the elements evaluated in the dynamics of the collaborative works have significant correlations, for example, the solution of problems is associated with the level of knowledge achieved with an r of 0.526, being qualified as moderate positive correlation. The significant relationship between motivation and social relationships follows in order of importance (r = 0.520); on the other hand, there is no correlation between the establishment of roles at the group level and what this means the increase of their knowledge (r = 0.004).

Likewise, the correlation is practically null with social relationships and intrinsic group motivation. A particular phenomenon is evidenced in that group discrepancies have significant importance with the establishment of roles, (r = 0.481). Most of the relationships are directly proportional from the "weak" to "moderate" scale, only four components show inverse relationships: group discrepancies with motivation, with social relationships and problem solving and motivation with the establishment of roles.

Regarding the competences that enhance the carrying out of collaborative works, Table 3 shows the evaluation by the students.

Table 3.

*Evaluation of the components of collaborative work*

| Qualifications | Knowledge | Teamwork | Leadership | Communication | Creativity |
|---|---|---|---|---|---|
| **1) Very important** | 27 | 12 | 25 | 32 | 3 |
| **2) Important** | fifteen | 30 | twenty-one | 24 | 5 |
| **3) Somewhat important** | 13 | twenty-one | 29 | 19 | 14 |
| **4) Little important** | 29 | 26 | eleven | 14 | 16 |
| **5) Not important** | 12 | 7 | 10 | 7 | 58 |

**Source:** Poll (2016)

The perceptions of students are dissimilar in terms of the evaluation given to components studied in collaborative work. When performing a Chi-square analysis, we have a *p-value* of 0.000, concluding that there are highly significant differences between variables and the valuation scale.

However, although students are not very clear about what teachers value in carrying out collaborative work, it is observed that respondents give greater

importance to the ability to communicate, followed by Teamwork; in third place is Leadership, which represents whoever assumes "command" of the working group; fourth, the Knowledge that students must apply to carry out the task; and, finally, Creativity.

It was considered appropriate to consult the opinion of students regarding whether their participation in the performance of collaborative work was more significant than performing the task individually, to which respondents answered with 93.8% that it was significant. This supports the fact that 71.9% of students prefer the collaborative work modality instead of the individual modality.

## 5. CONCLUSIONS

The current labor market demands workers not only highly qualified and with extensive work experience but also with professional skills (teamwork, leadership, negotiation, etc.), social skills (empathy, active listening, communication skills, etc.) and personal skills (respect, attitude of service, etc.), that allow them to carry out their work successfully.

Collaborative learning promotes teaching through group work, in which several of the aforementioned skills are put into practice, which, together with the increase of knowledge acquired in the group, seeks to fulfill the main objective that is not other than to deliver the task to the teacher.

It was possible to verify by conducting the poll that 19.8% of the students consider that they receive little motivation from the teachers to carry out the collaborative works, as well as significant importance regarding the existence of discrepancy in the establishment of roles within of the working groups ($r = 0.481$).

20.8% of respondents also consider that the performance of collaborative works have no relation to the environment in which they operate. All of this show is that a collaborative culture among students is not widespread in universities, since 28.1% continue to prefer to carry out projects individually. In addition, almost 20% consider that the works do not reflect the environment in which they operate, which would make it difficult to reflect on and critically understand the environment around them.

This first study has allowed us to know and analyze the reality of the students when doing collaborative work in classes, their opinion on the realization of the projects as well as the existence of conflicts between the members of the groups.

## 6. RECOMMENDATIONS

The study highlights the need to encourage students to carry out collaborative work, for which teachers must create appropriate learning strategies that encourage meaningful teaching. Collaborative learning also requires the teacher to participate more actively during the learning process, since this is the only way to achieve full involvement of students in the development of collaborative work.

Similarly, collaborative work should incorporate the use of technological means, which are so attractive to today's students; at the same time that they prepare students for the digital medium in which they are going to be projected as professionals.

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