International Journal for Innovation Education and Research

ISSN: 2411-2933

Challenges of collaborative education and academic learning in engineering higher education

Patricia Guedes Pimentel;Marcelo de Jesus Rodrigues da Nóbrega;Flavio Maldonado Bentes

Abstract

The focus that will be given in this article, is the relevance of collaborative teaching in the academic environment, with emphasis on higher education in engineering, considering the professional relationship between educating agents and students. To assist in the higher education process, the main challenges encountered will also be addressed, as well as to point out possible increasingly necessary solutions. Raising such important educational issues is necessary since the reference of an institution of higher education is based, among other aspects, on the qualifications of the teacher and his professional training, as well as on his ability to deal with everyday problems. Thus, seeking to achieve the proposed objectives, a bibliographic review was carried out on the theme presented and its consequences in relation to higher education, focusing on engineering courses. In addition to defining concepts related to collaborative teaching, this study links the relationships between higher education professionals, to the institution's growth and improvement. Finally, it was possible to verify that some of the problems listed in the present study are related to the way in which education professionals deal with everyday matters.

Keyword: Collaborative Teaching. University education. Professional Relationship.

Published Date: 8/1/2020 **Page.192-202** **Vol 8 No 08 2020**

DOI: https://doi.org/10.31686/ijier.vol8.iss8.2504

Challenges of collaborative education and academic learning in engineering higher education

Patricia Guedes Pimentel, Marcelo de Jesus Rodrigues da Nóbrega2, Flavio Maldonado Bentes3

1 Master student in Environmental Engineering (UERJ), Rio de Janeiro, Brazil. E-mail: engpatriciapimentel@gmail.com

2Post-Doctor in Civil Engineering (UERJ), Doctor in Engineering (PUC-Rio), Master in Technology (CEFET/RJ). Professor at UNIGAMA, CEFET-RJ and Santa Úrsula University, Rio de Janeiro, Brazil. E-mail: engmarcelocefet@terra.com.br

3Doctor in Mechanical Engineering (UFRJ), Master in Mechanical Engineering (UnB). Senior Researcher (FUNDACENTRO), Rio de Janeiro, Brazil. E-mail: flavio.bentes@fundacentro.gov.br.

Abstract

The focus that will be given in this article, is the relevance of collaborative teaching in the academic environment, with emphasis on higher education in engineering, considering the professional relationship between educating agents and students. To assist in the higher education process, the main challenges encountered will also be addressed, as well as to point out possible increasingly necessary solutions. Raising such important educational issues is necessary since the reference of an institution of higher education is based, among other aspects, on the qualifications of the teacher and his professional training, as well as on his ability to deal with everyday problems. Thus, seeking to achieve the proposed objectives, a bibliographic review was carried out on the theme presented and its consequences in relation to higher education, focusing on engineering courses. In addition to defining concepts related to collaborative teaching, this study links the relationships between higher education professionals, to the institution's growth and improvement. Finally, it was possible to verify that some of the problems listed in the present study are related to the way in which education professionals deal with everyday matters.

Keywords: Collaborative Teaching. University education. Professional Relationship.

1. Introduction

Considering the various problems found in school practices, Parrilla and Daniels (2004) comment that, as the difficulties present themselves in daily life, teachers seem to feel a lack of support, resulting in the lack of initiative to seek new solutions. In this way, habitual behaviors are adopted with no hope that they will work and, although the authors refer to the Spanish education system, this account is similar to the reality of Brazilian schools.

It is observed in more depth, the existence of possible flaws in the teaching-learning process, such as the emphasis given to the memorization of exercises and difficulties in the development of critical and self-

critical skills, of the knowledge that is passed on and learned. Therefore, it is important that all educational action is connected to the decisions made by members who are part of the school community.

Understanding that the collaborative teaching practice is an action dependent on foundation, mutual student/teacher participation, adaptation of classes for positive and more effective methodologies, among other experiences addressed in this study, it is necessary to seek commitment to quality educational actions, in order for new studies to increasingly stimulate the improvement of teaching mechanisms. Thus, in the search to improve teaching mechanisms and collaborative practices, a bibliographic review is made based on research published in books, journal articles, theses, dissertations, and other traditional documents in the area, from Brazil and other countries.

In its structure, first, the present study directs attention to conceptualize collaborative teaching, focusing on higher education in engineering courses, differentiating collaboration from cooperation. Following, arguments are brought up that involve the positive potential of collaborative work in the academic environment.

Finally, some of the challenges of academic learning in higher education courses are listed, in addition to demonstrating the relevance of scientific research as an instrument of significant and amplifying motivation, of the contents learned in the classroom, in the search to arouse the interest of students and develop critical thinking in the most diverse segments.

2. Development

2.1 Concepts and Definitions

According to Parrilla (1996, apud ARNAIZ, HERRERO, GARRIDO and DE HARO, 1999), the definition of collaborative groups is one in which all components share the decisions made and are responsible for the quality of what is produced together, according to their possibilities and interests. To qualify studies related to group work, terms that are like the theme such as collaboration and cooperation are used.

Damiani (2008) informs that, despite having the same prefix denominating joint action, the terms are different. While cooperation is related to practices of operation, execution, and operation of the system, on the other hand, collaborating is interpreted as work, production, and development of the appropriate activities.

Thus, the author makes it clear that, in cooperation, mutual assistance in carrying out tasks is verified, even though their purposes are generally not the result of a negotiation agreement prepared by the group. Therefore, it is admitted that there are unequal and hierarchical relationships between its members. However, the collaboration suggests that the members of a group help each other, in the search for reaching common goals adjusted by the collective. Thus, collaboration establishes non-hierarchical relationships, with shared leadership, mutual trust and co-responsibility for the conduct of actions.

Fullan and Hargreaves (2000), when studying the characteristics of the cultures of working together in schools, describe alternative forms of collaboration that do not constitute collaborative cultures, only occasional joint actions or actions regulated in a manner guided by the direction of the institutions.

Nevertheless, Torres, Alcântara and Irala (2004) argue that collaboration can be understood as a philosophy of life, while cooperation would be seen as an interaction used to facilitate the achievement of an objective or final product. The authors start from two premises: the rejection of authoritarianism and the promotion of socialization.

In research developed by Dearnley and Matthew (2007, p. 378, free translation), academic success is related to the "development of skills, knowledge and motivation required for independent and autonomous learning throughout professional practice".

However, the definition of academic success is given by Tavares (2000, p. 8), in which it is understood that:

> "By academic success we mean not only school or educational success, but also the personal, social and community success that the university student must achieve during his life inside the academy, which cannot be measured only by the classifications or grades of his school performance, but above all by the development of relational skills and competences, of discernment, of initiative, of a critical spirit and of common sense (...)" (TAVARES, 2000, p. 8).

Regarding the institutional point of view, Franco (2000) highlights that the teacher "is the one whose work plan has hours for research, but is also the one whose teaching hours are so many that there is no room for investigations sometimes, nor even to prepare your classes". From a situational point of view, the teacher:

> "(...) is one who works at a large and complex Brazilian university, whether public or private, with a solid postgraduate system and with the presence of consolidated research groups. It is also what works in an isolated higher education institution and in which teaching is the very reason for being. It is both what works at the market-oriented university and what works at the community institution anchored in its environment" (FRANCO, 2000, p. 63).

Finally, the Pedagogical Coordinator is one of the main actors involved in the educational processes of higher education. It is the one involved in educational practices, not only in pedagogical planning, but also committed to the difficulties of teachers and students, always seeking to assist in whatever is necessary.

2.2 Positive characteristics of collaborative work

Knowing that the learning mechanisms are related to interpersonal relationships, the teacher starts to represent a bond, which can be considered favorable or not. Thus, it is observed that in certain cases, some students do not learn the discipline, as they classify it according to the relationship they have with the teacher (SEDUC, 2020).

Thus, according to SEDUC (2020), "the mutual respect that is established, guarantees the harmony of interpersonal relationships at school and in the classroom, and is characterized as a true social phenomenon". Considering also that there are several pedagogical groups in higher education, each composed of teachers with diverse opinions and individualized teaching practices, it is admitted that collaborative work is an important tool to promote student-teacher interaction.

When we check certain practices performed in the school context, interpersonal relationships are linked to the way the manager conducts the actions developed. For Lück (2005), the importance of implementing participatory and democratic actions in the social unit is clear:

> "The participatory approach in school management demands greater involvement of all those interested in the school's decision-making process, mobilizing them, in the same way, in the realization of multiple management actions. This approach expands, at the same time, the collection of skills and experiences that can be applied in the management of schools, enriching, and improving them" (LÜCK. 2005).

According to Martins (2002), teachers are, for the most part, dispersed. Even considering the moments of organization, like the meetings in the teachers' rooms and meetings throughout the semester, such moments end up being consumed in an unprofitable way, for the elaboration of bureaucratic activities and the resolution of emergency problems. In this way, the author highlights a gap, which should be filled with the creation of "a space for reflection, planning and transforming your educational practice into humanized activities for yourself and your students" (MARTINS, 2002, p. 233).

Amid these arguments, it is worth emphasizing the ideas put forward by Góes (1997, p. 27), who considers:

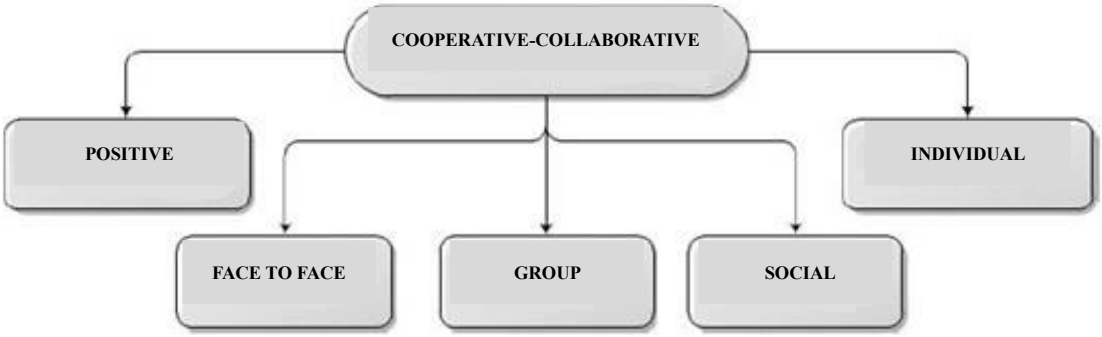
> "(...) the dialogical game between subjects does not tend to one direction; on the contrary, it involves circumscription, expansion, dispersion and stabilization of meanings. A certain knowledge (intended, in the intent of the other; or predicted, in the perspective of an observer) may or may not be constructed by the individual" (GÓES, 1997, p. 27).

In a detailed survey of collaborative work between teachers and the long-awaited school success, Damiani (2008) warns about the benefits of collaborative culture in the school environment:

"(...) it has low rates of repetition and dropout among its students (when compared to the averages of the city's schools) and a high degree of satisfaction and investment in continuing education for its teachers" (DAMIANI, 2008, p. 220).

Finally, it is possible to note the benefits of discussion groups and collaborative work between teachers, demonstrated in works such as those by Passos (1999), Magalhães and Celani (2000), Dickel et al. (2002), Detsch and Gonçalves (2002) and Silva (2002). Therefore, through the set of evidence verified in the literature, regarding the relevance of collaborative work in the academic environment, Figure 1 highlights some of the activities related to cooperative learning.

Figure 1. Activities related to cooperative learning



Source: FURTADO et al, 2014.

2.3 Academic learning challenges

Although there are professionals from various backgrounds, each with their unique values and characteristics of transmitting knowledge, it is necessary to respect this diversity of thinking, so that the higher education institution can develop beneficial actions in favor of students and education as a whole.

The teacher's posture in the classroom and his ways of transmitting certain theoretical content, together with more dynamic activities and a more modern and updated approach are undoubtedly fundamental questions to be discussed in order to address the problems evidenced by students, both disciplinary and academic performance during the course.

Considered crucial for the development of the student's critical thinking, the complementary methodology is given using laboratories and experimental classes in engineering courses. However, many disciplines seeking not to considerably increase the proposed workload, end up integrating experimental laboratory classes as extension classes of the theory / exercise of the discipline itself. The laboratories must be focused on the didactic application in the disciplines to which they are linked and also serve as support for research work.

Therefore, providing practical classes can help in the development of scientific concepts, and return a subject already addressed in the classroom with other approaches, leaving the student to have a new view on the same topic. In this way, the ability to broaden the reflection on a given subject can consequently generate discussions during classes and, with that, bring up critical thinking (OLISKOVICZ & PIVA, 2012).

According to Liberali (1999), the reflection that the teacher must provide about his own work, consists of verifying four actions: describe, inform, confront, and reconstruct. Cortez (2003), supported by Liberali (1999) exemplifies these four actions. According to the author, the moment to describe, consists of the act of the teacher reporting in writing his actions in class, to carry out a self-criticism of his strategies and objectives outlined for a certain content. About informing, the author defines for this stage that the teacher is looking for theories to support and base the planned class. “The way I teach demonstrates the power

relationship that exists in the classroom" (CORTEZ, 2003, p. 225).

Confronting consists of an analysis of posture and attitudes when teaching. Thus, the teacher will be able to conclude if his teaching is being carried out in such a way as to provide the true knowledge and growth of his students. And finally, rebuilding it, treated as the phase in which it is important to face with maturity and humility that we are not ready / finished, that we are always growing / changing (Cortez, 2003, p. 225).

Therefore, the rebuilding phase is considered in the present study as one of the most important, which aims to elucidate the teacher that continuing education is essential to achieve better academic performance, that is, that there are gaps in our daily practice that can be improved / filled, as we understand and learn new ways of acting (Cortez, 2003, p. 225).

Considering that professional development corresponds to both teacher training courses, as well as the sum of knowledge acquired throughout life, it is necessary to ensure quality school management, in addition to the use of various pedagogical practices. For Romanowski (2007):

> "Continuing education is a requirement for current times. Thus, it can be said that teacher training takes place on a continuum, starting with basic schooling, which is then complemented in initial training courses, with instrumentalization of the teacher to act in social practice, to act in the world and in the labor market. work" (Romanowski, 2007).

According to Rausch and Schlindwein (2001), the effects of discussions by groups of teachers who sought to reflect on their practices were investigated. The authors explain that:

> "For teachers to reframe their practice, it is necessary to theorize it. And this movement to theorize the practice is not only effective with training, lectures, seminars, expository classes, but much more, when there is a dynamic relationship with the practice of this teacher from a collective reflection" (RAUSCH and SCHLINDWEIN, 2001, p 121).

The authors also highlight the importance of the relationship between teachers:

> "It is necessary to unleash procedural, collective, dynamic and continuous training strategies. Reflecting with other teachers and sharing mistakes and successes, negotiating meanings and confronting points of view appears as something that stimulates a compromised pedagogical practice" (RAUSCH and SCHLINDWEIN, 2001, p. 121).

In addition to good salaries and adequate training, it is necessary to ensure competent school management, where the isolation of the classroom is ended. In this sense, Schôn (1997, p. 87) informs:

> "The development of an effective reflective practice has to integrate the institutional context. The

> teacher has to become a browser attentive to bureaucracy. And school leaders who want to encourage teachers to become reflective professionals must create spaces of peaceful freedom where reflection is possible" (SCHÔN, 1997, p. 87).

When it comes to teaching methodology, it appears that most university professors recognize the importance of teaching planning, but not everyone creatively prepares their classes. Many teachers simply follow the textbook chapters (GIL, 2012, p. 94). Thus, it is necessary to plan in detail the activities that will be practiced in the classroom. In addition, the intended objectives must be defined, what resources will be used, if there are execution times and the evaluation of the learning process.

According to Gil (2012, p. 95), educational planning can be defined as a systematic process through which educational activities can be made more efficient to achieve the established goals within a given period. Regarding the reflexive posture of a coordinator, Lima, and Santos (2007) state:

> "(...) with the practice and the teacher's view as a reference, the coordinator faces the challenge of building his new professional profile and delimiting his space of action. Their contribution to improving the quality of the school and the conditions for the professional practice of teachers will depend on the success achieved in this task" (LIMA E SANTOS, 2007, p. 06).

In these terms, one of the roles of the pedagogical coordinator is to assist with the anguish and difficulties faced by the teaching staff, in the search for establishing a dialogical relationship, always attentive to the changes that occurred at the university, being that:

> "(...) the pedagogical coordinator, needs to act to face these issues, with the possession of an educational proposal that has a clear concept of planning, objectives, contents, methodology and evaluation" (VASCONCELOS, 2002 p. 104).

It is also the responsibility of the coordinator to combat individualistic pedagogical practices (RAPOSO; MACIEL, 2005), assisting teachers in combating isolated actions. In addition, the relationship that the teacher promotes in the classroom is fundamental to a successful job.

According to Freire (1996, p. 103) "The climate of respect that arises from just, serious, humble, generous relationships, in which the teaching authority and the students' freedoms are ethically assumed, authenticates the formative character of the pedagogical space". Maintaining a respectful environment is vital to good practices in the teaching and learning process.

2.4 Scientific research as an instrument in higher education

Research is fundamental for any area, mainly for Engineering, in which the student must be encouraged to produce academic works, capable of developing a set of skills in the field of his future professional performance. Therefore, it is through a greater understanding between the practical reality and the theory

learned in the classroom, that we can conclude that the production of knowledge cannot be dissociated from the research practice.

Considering that young researchers arouse their interests and build their knowledge during the course at the University, a space surrounded by scientific data, by investigating the way in which research becomes relevant in higher education, we can correlate the information acquired and its contribution to training professional and personal development of young people and their academic development.

Therefore, it is during graduation that students of higher education courses must begin their academic productions, being inserted in research and extension projects guided by their respective teachers, who are able to build the bridge between classroom theory and practice. It is also important to mention that, according to the Law of the Education Guidelines and Bases 9.394/1996, it is established in its Art. 52:

> "Universities are multidisciplinary institutions for the training of professional staff with higher education, research, extension and mastery and cultivation of human knowledge, which are characterized by: I - institutionalized intellectual production through the systematic study of the most relevant themes and problems, both from a scientific and cultural point of view, as well as regional and national; II - one third of the teaching staff, at least, with academic master's or doctorate degrees; III - one third of the teaching staff on a full-time basis. Single paragraph. The creation of specialized universities by field of knowledge is allowed" (BRASIL, 1996).

The practice of researching and analyzing data, proposing solutions, as well as work aimed at public presentation, is a determining factor in the student's professional career in the future. Therefore, it is evident by Bridi (2010, p.184) that contributions from scientific initiation practices, "[...] can be a space for creative production with educational and pedagogical value".

There is also the relevance of research groups, which increasingly encourage and encourage young people and adults in higher and postgraduate courses, to carry out scientific studies to improve the knowledge acquired so far. Therefore, the growth of consolidated research groups is related to the National Council for Scientific and Technological Development (CNPq). It is worth remembering that, by definition, a research group consists of:

> "(...) a group of individuals organized hierarchically where the organizing foundation of this hierarchy is experience, prominence and leadership in the scientific or technological field, with professional and permanent involvement in research activities; where the work is organized around common lines of research; and where, to some degree, facilities and equipment are shared" (CNPq, 1999).

Thus, it is important to emphasize that the preparation of documents and technical reports reflects the professional who prepares them, as well as the mirror of his training as an engineer. The person who experiences a research practice, collaborates with a job market whose professionals are considered

autonomous, curious who seek to understand a situation experienced, its challenges and, in turn, find explanations and solutions to overcome each obstacle that they may possibly encounter in their career.

3. Conclusion

Considering that there are still many challenges to be faced, the literature review carried out in the present study, made it possible to understand how collaborative work in the academic environment should work, indicating that the development of certain activities, jointly and dialogically, can create an environment rich in academic and social learning.

From the reflections made during the research, some collaborative approaches were observed, demonstrating their relevance in the teaching-learning process in the area of education. Collaborative work, in addition to making it possible to rescue important values of our society, such as sharing and solidarity, seeks to assist in facing the various challenges present in higher education in engineering. In addition, it is a determining factor for the teacher education process, as it contributes to the creation of strategies that can break the barriers that hinder the development of activities.

The present research also verified that the collaborative practice helps in the creation of necessary rules and procedures for group work. Therefore, the strengthening and promotion of the use of such a practice should be encouraged, so that one can positively collaborate in the construction of knowledge, both in the training of teachers and in the evolution of students' learning.

Given the above, it is understood that collaborative actions generate beneficial results, which can assist teachers and the university. On the other hand, it was evident that in order to get productive classes, there must be mutual respect between those involved in the educational process. Among the difficulties faced by teachers today, the most important are the overload of activities and the lack of infrastructure and personnel to develop their tasks with quality. Both situations point to the consequent devaluation of the teacher, reflecting on the failures and problems of the institutions.

Another issue raised was in relation to the responsibilities of the pedagogical coordinator, because when it is possible to define points of convergence between those involved in the educational process, it is possible to observe the success that leads to the collective construction of knowledge. Although the present study did not address all the beneficial characteristics offered by collaborative work in such a detailed way, it is believed that through the evidence presented, and the literature review performed, this practice is extremely relevant in the academic environment, especially in programs continuing education.

Finally, based on the studies covered, it is possible to state that scientific research is a fundamental practice that generates questions, which expands knowledge and adds benefits in the professional life of the engineer. In addition, this study clearly demonstrates the relationship between research and collaborative work, in which the results are increasingly satisfactory.

Acknowledgement

This work did not have funding from a funding agency or any other financial support.

References

ARNAIZ, P., HERRERO, A.J., GARRIDO GIL, C.F., DE HARO, R. Collaborative work between teachers and attendants in diversity. Educative community, 262, 29-35, 1999.

BRAZIL. Law No. 9,394, of December 20, 1996. National Education Guidelines and Bases. Official Gazette, 1996.

BRIDI, J. C. A., Research on the training of university students: Scientific Initiation as a space of possibilities. 214 f. 2010. Thesis (Doctorate) - Graduate Program in Education, University of Campinas, Campinas, 2010.

CNPq. Research Groups Directory. v. 3, 1997 database. Brasília, 1999.

CORTEZ, C. D. C. Studying ... Learning ... Teaching ... Changing ... Transforming: A continuous process. In: BARBARA, L.; RAMOS, R. de C. G. Reflection, and actions in the teaching-learning of languages. Campinas: Letters market, 2003. p. 221-234.

DAMIANI, M. F. Understanding collaborative work in education and revealing its benefits. Educar em Revista, n. 31, p. 213-230, 2008.

DEARNLEY, C.; MATTHEW, B. Factors that contribute to the success of undergraduate students. Higher education teaching, v. 12, n. June 3, 2007, p. 377-391.

DETSCH, R.J.; GONÇALVES, M. A. S. Cooperative creation of a laboratory in the school: an experience of building norms of social interaction. In: SOUTH REGION EDUCATION RESEARCH SEMINAR (ANPED-SUL), 4., Florianópolis, 2002. Anais ... Florianópolis, 2002. p. 1-8. CD-ROM.

DICKEL, A. et al. In a process of continuing education, a possibility of articulation between theory and practice: reflections on a shared experience. In: SOUTH REGION EDUCATION RESEARCH SEMINAR (ANPED-SOUTH), 4., Florianópolis, 2002. Anais ... Florianópolis, 2002. p. 1-10. CD-ROM.

FRANCO, M. E. D. P. Community of knowledge, research and training of higher education teachers. Higher Education Teacher Handout: identity, teaching and training. National Institute of Educational Studies and Research, 2000.

FREIRE, P. Pedagogy of Autonomy. 18 Ed. Rio de Janeiro: Paz e Terra, 1996.

FULLAN, M.; HARGREAVES, A. The school as a learning organization: seeking quality education. 2. ed. Porto Alegre: Medical Arts, 2000.

FURTADO, C. Q.; NEVES, T.P.; NASCIMENTO, A. C. do; RODRIGUES, M. G. F .; VASCONCELOS, L. G. S. Cooperative-collaborative learning in higher education applied as exact sciences. In: IV NATIONAL SYMPOSIUM ON TEACHING SCIENCE AND TECHNOLOGY. Pronta Grossa, 2014.

GIL, A. C. How to plan teaching. In Didactics of higher education. São Paulo: Atlas, 2012, p. 94-108.

GOÉS, M. C. R. The intersubjective relations in the construction of knowledge. In: GOÉS, M. C. R .; SMOLKA, A. L. B. (Org.). The meaning in educational spaces: social interaction and subjectivity. Campinas: Papirus, 1997.

LIBERALLI, F. C. The diary as a tool for critical reflection: doctoral thesis in linguistics applied to

language teaching. São Paulo: PUC, 1999.

LIMA, P. G.; SANTOS, S. M. dos. Pedagogical coordinator in basic education: challenges and perspectives. Vol. 2 nº 4 Jul / Dec. 2007. Revista de Educação p. 77-90.

LIMA, P. G. Pedagogical Knowledge of Contemporary Education. Engineer Coelho / SP: Adventist University Center of São Paulo, 2007.

LÜCK, H. et al. The participatory school: the work of the school manager (5th ed.) Petrópolis: Vozes, 2005.

MAGALHÃES, M. C. C.; CELANI, M. A. Continuing education: teachers'collaboration in the construction of meaning in their classroom discourse practices. In: III SOCIO-CULTURAL RESEARCH CONFERENCE, 3., Campinas, 2000. Annals. Campinas, 2000. p. 1-29. CD-ROM.

MARTINS, S. T. F. Science education and group activity from a socio-historical perspective. Science & Education, Bauru, v. 8, n. 2, p. 227-235, 2002.

OLISKOVICZ, K., PIVA, C. D. - Didactic strategies in higher education. Education Magazine - Anhanguera Educacional Ltda. v. 15, n. 19, 2012.

PARRILLA, A.; DANIELS, H. Creation, and development of support groups for teachers. São Paulo: Loyola, 2004.

PASSOS, L. F. The pedagogical project and differentiated practices: the meaning of exchange and collaboration. In: ANDRÉ, M. (Org.). Pedagogy of differences in the classroom. São Paulo: Papirus, 1999.

RAPOSO, M.; MACIEL, D. Teacher-Teacher Interactions in the Co-Construction of Pedagogical Projects at School. Psychology: Theory and Research Sep-Dec 2005, Vol. 21 n. 3, pp. 309-317.

RAUSCH, R. B.; SCHLINDWEIN, L. M. The reframing of thinking / doing by a group of teachers in the initial grades. Counterpoints, Itajaí, Vol. 1, n. 2, p. 109-23, 2001.

ROMANOWSKI, J. P. Teacher Training and Professionalization. Curitiba: Ibpex, 2007.

SCHÖN, D. Train teachers as reflective professionals. In: NÓVOA, A. Teachers and their training. Lisbon: Don Quixote, 1997.

SEDUC. State Secretariat of Education. Government of Mato Grosso. Available at: http://www2.seduc.mt.gov.br/-/a-imprescindivel-acao-das-relacoes-interpessoais-no-ambito-escol-1 Accessed on: 05/30/2020.

SILVA, M. da. Developing interpersonal relationships in the collective work of teachers. In: ALMEIDA, L. R. de; PLACCO V. M. de. Interpersonal relationships in teacher education. São Paulo: Loyola, 2002.

TAVARES, J. Preface In: TAVARES, J; SANTIAGO, R. A., Higher education: (in) academic success, Porto: Porto Editora, p.7-10, 2000.

TORRES, P. L.; ALCÂNTARA, P. R.; IRALA, E. A. F. Consensus groups: a collaborative learning proposal for the teaching-learning process. Educational Dialogue Magazine, Curitiba, v. 4, n.13, p. 129-145, 2004.

VASCONCELLOS, C. dos S. Coordination of pedagogical work: from the political pedagogical project to the daily classroom. São Paulo: Libertard, 2002.