

CENTER FOR TEACHING AND LEARNING IN THE SCHOOL OF CIVIL ENGINEERING

José C. Redaelli – jcredaelli@gmail.com *

Orlando F. L. Jr. – oflimaj@fec.unicamp.br *

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Universidade Estadual de Campinas, FEC-Faculdade de Engenharia Civil, Arquitetura e Urbanismo da Unicamp, LALT-Laboratório de Aprendizagem em Logística e Transportes Cidade Universitária Zeferino Vaz - Barão Geraldo 13083-970 – Campinas/São Paulo - Brasil

Abstract: This is a descriptive study involving Center for Teaching and Learning in higher education institutions. Relevant books and articles have been chosen. Their authors were or are in high positions in those centers. These centers are a crucial area in Higher Education Institutions aiming at leading the faculties' academic behavior to improving their academic instruction their teaching methods. Programs and services supplied by one center will not necessarily fit other centers. It depends on the culture of the institutions and faculties. Needs assessment and other measures are necessary together with continuous evaluations of the centers work. The feedback is relevant for the center to steer the directions of its programs and services. Committing to faculty development is the most crucial mission of a center aiming at achieving teaching and learning excellence, involving graduate students, teaching assistants, postdocs, new faculties and others in need. The top issues of a Faculty Development Program by 2021 are blended approaches of learning, active methodologies, faculty development leadership, interdisciplinary approaches, work and life balance, mentorship, teaching peer review, new faculty support, teaching assistant development, faculty work time management, faculty work ethical conduct, community learning service and scholarly writing, among others. The objective of this study is to describe the functional characteristics of a center, with focus on the Faculty Development Program. It is part of a doctoral project concerning the proposal of one center for the School of Civil Engineering, in Unicamp, a Brazilian university.

Keywords: Center for Teaching and Learning. Civil Engineering Education. Faculty Development.

1 INTRODUÇÃO

An expert professional is in demand now due to the new global economy and the schools are conscious that teaching and learning has turned into a core issue for this request in this century. The Center for Teaching and Learning (CTL) is a crucial area in Higher Education Institutions where it supplies its stakeholders with teaching and learning services. All stakeholders see the establishment of a CTL as an engagement of the host institution in teaching and learning processes.

A few articles on the characterization of a CTL have been published. Some important books and their references with relevant articles have been chosen. Some articles in educational agencies reports were also found.

The current literature on teaching and learning or CTL characterization fails in not stating the high relevance of social-emotional skills of individuals. FORUM (2018) contended that the existing technology, a variety of job roles, and occupational formation are transforming the requirement for skills very fast. This takes to a societal and an economic move by governmental agencies, people and businesses towards lifelong learning, as well as reinforcement of skills among others. Social-emotional and technology-based skills are progressively changing into more important one after the other.

Characterization of a CTL is relevant for our intensified comprehension of the relevance of teaching and learning support in higher education institutions, and for a variety of stakeholders.

The objective of this study is to describe the functional characteristics of a CTL, as its mission, faculty, leadership, staff profile, visibility, cooperation, CTL work, among others, to be proposed for the School of Civil Engineering, Architecture and Urban Design, Transport Area, in Unicamp, a Brazilian University. It is part of a doctoral research project.

2 LITERATURE REVIEW

2.1 Teaching and Learning

In the beginning, the teaching and learning quality in higher education was just academics. Great amount of stakeholders who are now taking part in concepts and thoughts about it, have taken the subject to a change (WESTERHEIJDEN; STENSAKER; ROSA, 2007). Sir Ken Robinson agreed that knowing the contents is very important, but he complemented that this is not enough (ROBINSON; ARONICA, 2015). Many components can contribute to teaching enhancement. The education and comprehension in the subject matter should be accompanied by the enthusiasm before the students, by the ability to lead them to the adequate level for them to reach a comprehension, and by facing risks to make the teaching learned (GIBSON, 2009).

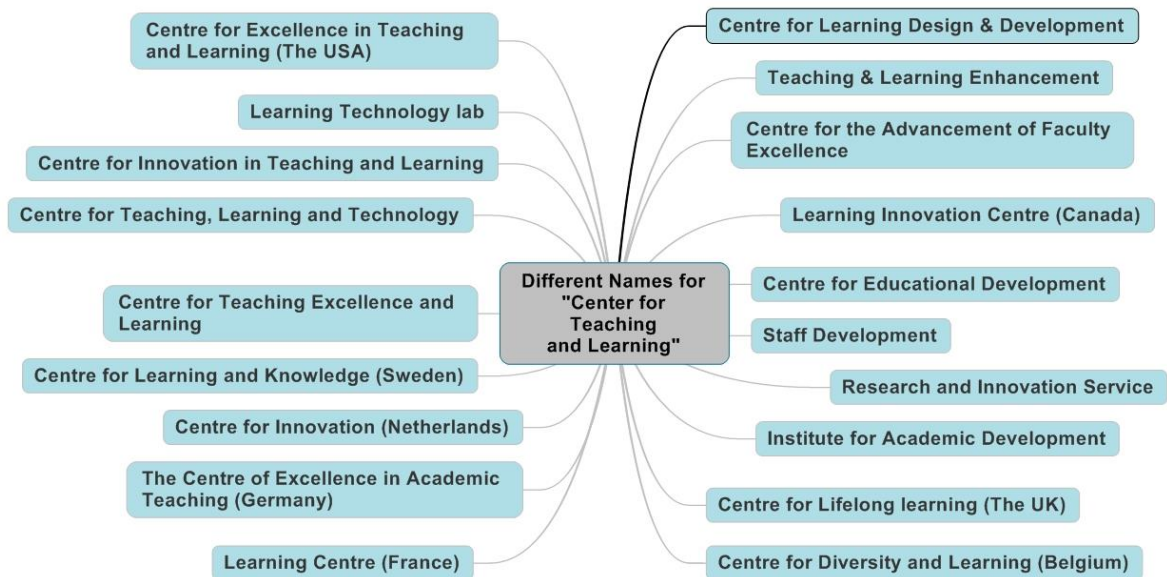
The research on teaching progressed from behavioral psychology into cognitive psychology in the 1980s. The researchers changed their focuses into teachers' thinking and knowledge. It was then possible to witness teaching as evaluation of knowledge about instructional goals, students and discipline, and not as a set of behavioral abilities (S. SHULMAN, 1987).

2.2 Center for Teaching and Learning

Although a wide variety of names have been used in literature, the name Center for Teaching and Learning is used in this paper to refer to these centers (See Fig. 1).

Committing to educational or faculty development is the most crucial mission of a CTL (FORGIE, 2018). One of the aims of CTLs is to improve the teaching and learning quality seeking for excellence within their universities (LEMMENS-KRUG, 2015). GIBSON (2009) stated that, as an excellent faculty demands excellent trainings, the establishment of a CTL helps show the institutional engagement in excellent teaching. Although the first CTLs were established to attain goals as supporting faculties to use strategies and providing proposals for educators to enhance students' learning, the roles that a CTL should play have progressively changed since the 1960s. Emphasis on individual faculties has changed from repairing into support and quality enhancement on a wider scale. CTLs have been managing evidence-based approach to perform teaching and learning and doing research on the results of these interventions to supply constantly this environment towards improvement (FORGIE, 2018). These have taken CTLs to adjust their composition incorporating consultations and workshops regarding research projects on teaching and learning (SORCINELLI, M. D., 2002).

Figure 1 - Different Names for a Center for Teaching and Learning



Source: adapted from (COOK C., 2012)

GIBBS (2013) argued that CTLs in good health must develop and transform because their host institutions also change along the time. Gibbs contended that it is inconvenient for faculties to improve without transformations and true values from their colleagues. It is relevant to place CTL work within the institutional environment, answering to its culture, faculties and administrators' necessities. CTLs will be independent to outline specific programs with the highest impact on teaching and learning in case they have a partnership with the institutional concern (SORCINELLI, M. D., 2002).

CTLs and university leadership aim at leading the faculties' academic behavior to improving their academic instruction and increasing their teaching methods. They have the formal authority with the structural regulations, which this leadership must have to manage and guide the faculties' behavior. The informal authority is about understanding the expertise existing within a CTL, which is made with great amounts of measures occurring in a CTL, as managing research projects on teaching and learning processes; supplying services to students, as mentoring and counselling to faculties as instruction and career development; engaging in the regular teaching and learning methods organization, and others. The CTL is unique with variations depending on their composition, their responsibility and different jobs they perform (LEMMENS-KRUG, 2015).

It is important to know the effect of the Faculty Development Program created by the CTLs to support faculties. The participant audience and satisfaction does not measure the actual impact. The effect of a CTL program on teaching practices may be evaluated through observational practices (HINES, 2009), and students' surveys with some teaching instructions or after attending a CTL program (GIBBS; COFFEY, 2004). As for the students' learning, this may be evaluated using direct examination (HINES, 2009), and pre and post-test intervention (KUCSERA; SVINICKI, 2010).

ZIMMERMAN (2005) in his article 'Attaining Self-Regulation: A social cognitive perspective' argued the relevance of the Self-Reflection phase of the Cyclic Self-Regulated Learning Model, where the individual could foster self-evaluation, self-satisfaction, the correct causal attribution of the tasks success or failures, and being in a adaptive or defensive position. The adequate self-reflection could provide the ideal feedback for the learning cycle.

3 METHODOLOGY

Some articles about teaching and learning using these as search keywords have been found in Web of Science platform. The keywords for CTL search were 'Center for Teaching and Learning', 'Centre for Teaching and Learning', the British version. The acronym CTL is the most used to mean Center for Teaching and Learning, although centers all over the world use different names. Using this platform and others to find articles involving characterization of a CTL has brought no results.

This article has used then two main books and mainly their references. One is the 'Advancing the Culture of Teaching on Campus-How a Teaching Centre can make a difference' from 2012, edited by Constance E. Cook and Matthew Kaplan. It states the different ways a CTL can help the host institution and other CTLs through collaboration. It states involvements in CRLT-Centre for Research on Learning and Teaching, in The University of Michigan, where Constance served as an executive director. The second book is 'Faculty Development in the Age of Evidence-Current Practices, Future Imperatives' from 2016, edited by Andrea L. Beach, Mary Deane Sorcinelli, Ann E. Austin, and Jaclyn K. Rivard. The authors of this book are involved in Center for Teaching and Learning, and Faculty Development Program (FDP), among others. They have been involved as co-director, founding director of CTL, FDP founder, and associate provost. The Ph.D. student, also author of this book with less experience but with strength on FDP, and faculty learning communities, among others.

Articles ranging from 2012 up to 2018 were found. This was prosperously attained although due to their relevance for the context, older articles were also selected.

4 RESULTS

4.1 The Mission of a CTL

All higher education institutions provoke a conflict in promising continuous and high-quality teaching. Many faculties have been engaged in research instead of teaching and this has partly motivated the development of CTLs (FORGIE, 2018).

A wide range of papers reporting ways to settle a CTL, being a transformation agent in higher education and its preferences have been broadly published (GILLESPIE; ROBERTSON; BERGQUIST, 2010; SORCINELLI, M. D., 2002) but little has been said about the operation inside of a CTL (SORCINELLI, M. D. A., A.E.; EDDY, P.L., 2006). Management earns careful consideration because it is a crucial element for the CTL success, in spite of challenges. A CTL has to set the right role of the director, plan and discuss a budgetary model, contact and look after staff, and have operational principles (COOK, C. E., 2012).

It is important for all higher education institutions to have a CTL, if they want to flourish. This shows that the institutions value teaching and learning processes. It is not possible to have the same composition in all CTLs, although some tasks might function well in some CTLs (FORGIE, 2018).

Participating in Educational and Faculty Development is mandatory and is considered the main mission of CTLs. The first CTL was created in the USA in the 1960s to convey the importance for teaching and learning (FORGIE, 2018). It was founded at the university of Michigan (CRLT) in 1962 to provide support for faculties to embrace methods and strategies which had been validated by teaching and learning research projects (COOK, C. E., 2001). Michigan CTL was part of the first wave of centers (1960s); the second wave of CTLs came in the 1970s, as CTLs created by Danforth Foundation, e.g. Empire State University, Spelman College, Northwestern University, and Stanford University; and the Searle Centre in the University of Northwestern, founded in 1992 was part of the third wave (GIRASH, 2012).

4.2 The Faculty

The use of CTLs should be encouraged by the host universities leaders through supporting good relationships and resources to faculties accordingly. Even so, the CTL will have to work regarding its visibility and attention to the faculties, demonstrating them precious opportunities, and fitting their needs. It takes time to make a CTL an integral part of the university community. At research-intensive universities, teaching and learning related subjects become more difficult to be conveyed (COOK, C. E. K., MATTHEW ; V, JANA; WRIGHT, MARY C. , 2001). Research versus teaching is a difficult task among CTLs. This dichotomy should be excluded to provide a healthy connection between them (FORGIE, 2018).

Faculty may not know what a CTL is and what it does. It takes time to make a CTL an integral part of the university community. At a research university, the emphasis is on research, not in teaching. Getting attention for the CTL should be the first step. A CTL should have the highest possible visibility, showing the importance of teaching and making its services familiar for campus colleagues (COOK, C. E. M., D.S., 2012).

Research versus teaching is a challenge among CTLs. In some institutions, the research takes up half of the budget. This dichotomy between both should be eliminated to maximise the connection between them (FORGIE, 2018).

Knowing the priorities of the central administration, leaders, and other universities offices makes CTL familiar. This might be difficult in a decentralized university. As for the faculty development, a CTL will be successful with administrators taking the initiative in three key areas: be suitable to campus leaders, provide motivation and opportunities to administrators, be receptive to campus leaders and make the CTL noticeable (COOK, C. E. M., D.S., 2012).

4.3 Faculty Development Program

A relevant role of CTLs is to prepare graduate students and postdocs for future faculties. These students can be inserted to teaching, research and service in a broad range of institutional environment (COOK, C. E. K., MATTHEW ; V, JANA; WRIGHT, MARY C. , 2001).

SORCINELLI, M. D. A., A.E.; EDDY, P.L. (2006) stated which goals faculty developers established to lead their programs. A survey was done with CTL directors who had to show ten purposes or goals they used to guide their CTLs or programs. The degree range was from 'Not at All', up to 'to a great degree'. This was done in 2006, and another survey was taken in 2016 (BEACH, 2016). Table 1 indicates these items in both years. Table 2 shows that the survey in 2016 had education with the highest degrees of faculty developers (42%). The table also shows STEM (science, technology, engineering, and math), SBE (social, behavioral, and economic sciences), and professional (medicine, health professions, and business). According to BEACH (2016) some top issues, which should be part of FDP until 2021 can be seen in Fig 2.

4.4 Leadership in CTLs

The management and leadership is critical for the effectiveness of faculty development programs (SORCINELLI, M. D., 1988; ZAHORSKI, 1993). It is crucial to have this leader with commitment, energy, time and vision in developing, creating, maintaining and evaluating services (SORCINELLI, M. D., 2002). It is relevant to have the administration of a CTL engaged in the FDP conception and in having an active place in building an adequate environment for teaching (SORCINELLI, M. D. A., N., 1995). The leader can create more visibility for any CTL staying longer on campus to organize lobby successfully, mainly in the first years in spite of the frequent conferences, making the director busy. Players frequently change on campus and many things move very fast. Being crucial for the CTL, staying in campus makes the director understand and respond immediately to new challenges and

opportunities. Participating in key committees and university projects, together with personal contacts involving key players in the institution are relevant issues for the CTL director. In any occurrence organized by the CTL done in collaboration with others should have the director's identification. A brief introductory comment in every event made by the director will be reminded as the CTL involvement (COOK, C. E., 2012).

It is relevant to commit to collaborations with the campus community, with administration offices dealing with academic issues. If this is done it might increase the CTL influence substantially (SORCINELLI, M. D., 2002).

Table 1: Goals Guiding Faculty Development Programs Comparison - adapted from (BEACH, 2016)

Program Purposes or Goals	2006	2016
	Mean (SD)	Mean (SD)
Generating or sustaining a teaching excellence culture	3.7 (0.6)	3.8 (0.5)
Promoting new initiatives in teaching and learning	3.6 (0.7)	3.7 (0.5)
Supporting and responding to professional development goals of individual faculty	3.5 (0.8)	3.3 (0.9)
Performing as a change agent	3.2 (0.9)	3.3 (0.8)
Supporting faculty with teaching difficulties	3.0 (1.0)	3.1 (1.0)
Promoting cooperation among departments and/or faculty	3.1 (0.9)	3.1 (0.9)
Answering critical needs as established by the institution	2.9 (0.9)	3.1 (0.9)
Placing the institution at the forefront of educational innovation	2.6 (1.0)	2.8 (1.0)
Supporting development, goals and planning in departments	2.5 (1.0)	2.6 (0.9)
Recognizing and rewarding for teaching excellence	2.5 (1.1)	2.6 (0.9)

Source: adapted from (BEACH, 2016)

Table 2: Faculty Developers Highest Degree - adapted from (BEACH, 2016)

Field	All Respondents		Faculty Respondents		Directors	
	N	%	N	%	N	%
Education	148	42	88	28	66	36
STEM	44	13	62	20	23	12
Arts and Humanities	61	17	58	18	41	22
SBE	93	27	86	27	52	28
Professional	13	4	22	7	2	1

Source: adapted from (BEACH, 2016)

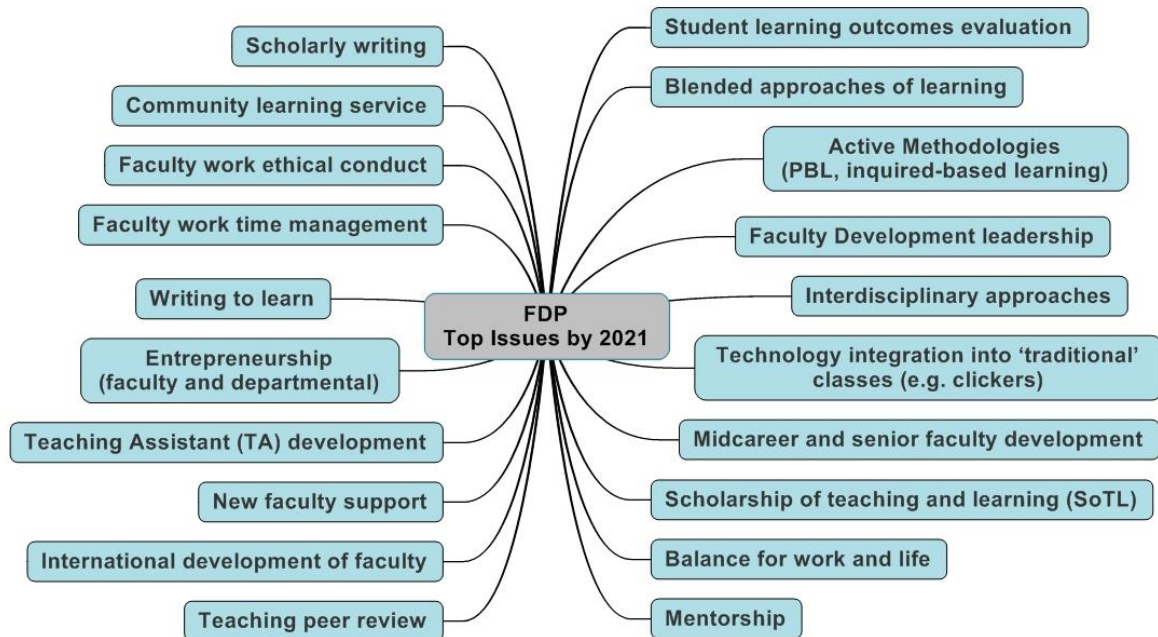
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identification. A brief introductory comment in every event made by the director will be reminded as the CTL involvement (COOK, C. E., 2012).

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Figure 2 – Faculty Development Program Top Issues by 2021



Source: adapted from (BEACH, 2016)

4.6 CTL Staff

The quality of CTL staff makes its reputation. The center has to demonstrate its value delivering considerable quantities of excellent work. CTL staff have to be highly active and motivated, innovative and not only specialist at their work. Bad choices can cause bad reputation. Academic writing, consulting abilities, faculty development familiarity, event organization, involvement as a change agent in the institution, interpersonal abilities, and public speaking are some abilities needed for CTL staff. They should cover some areas as website management, computer support, and a manager to supervise these staff members and to do research as well. They should be persuaded to fit their jobs according to CTL mission but also to their own skills and interests. It is very relevant that the candidates can acknowledge their weak points during their hiring processes (COOK, C. E., 2012).

ZIMMERMAN (2005) in his article 'Attaining Self-Regulation: A social cognitive perspective' argued the relevance of the Self-Reflection phase of the Cyclic Self-Regulated Learning Model, where the individual could foster self-evaluation, self-satisfaction, the correct causal attribution of the tasks success or failures, and being in a adaptive or defensive position. The adequate self-reflection could provide the ideal feedback for the learning cycle.

New hired staff should have training and socialization as an important matter as well as accompanying CTL colleagues in students' feedback sessions and consulting. They should be persuaded to develop research projects and publish the results, although the center services take priority. The best research project is the one improving the center work. Any opportunity to

enhance teaching and learning in the institution cannot be missed. The staff should also attend conferences with their presentations (COOK, C. E., 2012).

4.7 CTL Operation

Operational principles of a CTL should be service positioning, fast reaction time, responsibility and quality control. Being responsive and service-based are probably the most relevant principle. Although initiating new programs and services is important, answering positively to the requests is more effective. The response from a CTL should be as fast as possible because faculties and administrators are busy people (COOK, C. E., 2012).

It is the director's accountability to establish high quality for CTL work. A continuous enhancement of processes with frequent evaluations might make the center reach success. Seminars, workshops, roundtables and other services as assessment research and publication should be part of CTL work. All these should be suitable for any demand. CTL should work any new solution with a strong support from the institution. It is not wise to come to solution independently. The programs or services should be designed carefully (COOK, C. E., 2012).

For creating harmony on its best practices of its resources, CTL must acknowledge that it needs the support of all stakeholders of the institution as teaching assistant, faculty, administration and students. Considering this a difficult task some centers evaluate faculties' interests through a "Need assessment", where important challenges can be identified and be faced by CTL staff (SORCINELLI, M. D., 2002).

4.8 Academic Staff vs Professional Staff

The Professional and Organizational Development Network in Higher Education (POD) for professional staff who work at a CTL reported that teaching enhancement should encompass three components of a center work: faculty development, instructional development and organizational development (COOK, C. E. M., D.S., 2012).

CTLs should meet a wide variety of players and organizational issues, which shape an institution's culture (BARON, 2006; SORCINELLI, M. D. A., A.E.; EDDY, P.L., 2006). As BARON (2006) argued, the effectiveness of faculty development relies on its ability to influence and participate in organizational development independent of its own frontiers.

5 CONCLUSIONS AND RECOMMENDATIONS

Certainly, the existence of a CTL in any institution is indispensable to show the value of Teaching and Learning. As this is not enough, the CTLs have to evaluate their work progressively and to enhance their work according to feedback experience. This is a great place to associate the values of high relevant components of education: Research, Teaching and Learning. Although this is a difficult task to be attained, mainly in research-intensive universities, the CTL is the correct place having the best opportunities for this. The CTL has to persuade stakeholders into the relevance of its programs and work. That can explain the high importance of CTL networking inside and outside the host institutions, in the same country and abroad. Working with cooperation inside and outside the institution, having a good staff team, and undertaking frequent CTL work assessment for constant improvement are mandatory for the success. These can reinforce the role of the centers. The expression 'One fits all' does not work here as well. CTLs are accountable for teaching and learning processes comprised of services, faculty development programs for Teaching Assistants, Ph.D. students, and all levels of faculty. The tasks and the variety of these programs and services will rely on the context and culture of the host institution.

In CTL literature, no emphases have been found regarding the individuals' socio-emotional skills. The stakeholders, as students, faculties, professional and academic staff and institutions leaders are key individuals for a CTL. This takes to a very special stakeholder who are the undergraduate students and their instructors. Understanding them should have a great concern mainly in the students' first two years of their studies because this is the important phase to retain them in the course and school. That might explain the need for a more holistic approach concerning these main stakeholders involved.

Many scales, inventories and questionnaires could be applied to identify known skills and might be useful to help plan any program or discussion in any level with these stakeholders.

The demand and importance that research-intensive institutions have for academic writing literacy should highlight the relevance of writing centers in CTLs.

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