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ARTICLE

INDIVIDUAL LEARNING, ORGANIZATIONAL SUPPORT AND PERCEIVED TEACHING PERFORMANCE: A STUDY WITH UNIVERSITY TEACHERS

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ABSTRACT: This article analyzes university teachers' perception about competences' learning processes and their perceived performance, as well as the moderating role exercised by organizational support in the relationship between individual learning and perceived teaching performance. To explore the relationship among competency learning, support and job performance, a survey was carried out with 275 teachers from a federal university in the northeast of Brazil, that replied to the perception inventory of competency learning, transference support and teacher performance (ASOD). By analyzing the replies, it was confirmed that teacher learning in teaching, research, extension and management activities is the best predictor of performance perception. No evidence was found that the support moderates the relationship between teacher learning and perceived performance in the four activities.

Keywords: Individual learning. Organizational support. Teaching performance.

APRENDIZAGEM INDIVIDUAL, SUPORTE ORGANIZACIONAL E DESEMPENHO PERCEBIDO: UM ESTUDO COM DOCENTES UNIVERSITÁRIOS

RESUMO: O estudo analisou as relações entre a percepção de aprendizagem de competências e de desempenho de docentes de nível superior. Além disso, testou o papel moderador do suporte organizacional na relação

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entre a aprendizagem individual e desempenho docente. Participaram do estudo 275 docentes de uma universidade pública federal, que responderam ao inventário de percepção de aprendizagem de competências, suporte à transferência e desempenho docente (ASOD). Foram realizadas análises confirmatórias e testados os modelos de predição e moderação. Uma das conclusões do estudo foi que a aprendizagem docente nas atividades de ensino, pesquisa, extensão e gestão predizem a percepção de desempenho em cada uma das atividades respectivamente. Não foram encontradas evidências de que o suporte modera as relações entre as aprendizagens e a percepção de desempenho docente.

Palavras-chave: Aprendizagem individual. Suporte organizacional. Desempenho docente.

INTRODUCTION

The activities of teaching, research, extension, and management guide the performance of higher education teachers in the Brazilian public university context (BRASIL, 2012; Review of Opinion No. 37, 2007). This broad scope of activities has effects on the demands made on the performance of university professors at public institutions. The performance in teaching, research, and extension, however, have specificities that require multiple competencies, involving different levels of learning.

Performance in teaching in higher education requires, beyond conceptual mastery, methodological competence in techniques for teaching young adults. Certainly, the production of knowledge can help increase the conceptual mastery of the teacher, and to better qualify him/her for teaching. Research competencies, however, are related to methodological domains pertaining to the production of knowledge, which includes defining the research problem, and data collection and analysis procedures, resulting in the writing of scientific texts. The competencies related to extension involve the ability to link the production of knowledge and practical application in diverse social contexts, which can also expand the teacher's repertoire of competencies with effects on teaching performance.

The major challenge for teachers in higher education is to develop competencies that help them take on management functions, from the simplest, that is, those of representation in collegiate bodies, to those of coordination, direction, and leadership of departments and academic units. In submitting to public competitions to enter a university teaching career in public institutions, the vast majority of professors are motivated by their love of teaching and other related

academic activities. The connection to research is more recent and coincides with the growth of stricto sensu postgraduate programs in Brazil (CIRANI, CAMPANÁRIO, & SILVA, 2016; CAPES, 2014; REEXAME DO PARECER N. 37, 2007), given that the universities appear as the main fields of work for those who obtain the title of doctor and intend to pursue an academic career.

The study that will be described in this article seeks to explore the relationship between the learning of competencies by public university professors for each of the activities required in their professional activities and their self-perceived performance. One of its contributions is to bring new evidence of the validity of the factorial structure of the inventory of learning, support, and performance of professors (*ASOD*), a measure created for the Brazilian context and already tested in another sample (PEREIRA, 2014). This inventory was specially designed to analyze the relationships between learning, support, and performance of professors who work in public higher education institutions. An additional contribution is that of providing input to qualification policies for university professors. Finally, one more contribution is in understanding the role of organizational support in the transfer of individual learning for performance, and what teacher learning can be more easily transferable to other contexts, in turn having repercussions on the performance of other activities beyond the more specific activity.

Studies relating the learning of competencies and professor performance are still scarce. The study by Pereira (2014) developed and tested an inventory (*ASOD*) for measuring professors' perceptions about their competency learning processes, their job performance, the support received from the organization, and it explored the relationship between competency learning, support, and job performance. Positive associations were found, mainly between the acquisition of competencies and the performance shown in each activity (teaching, research, extension, and management).

The study by Grohmann and Ramos (2012) identified strong correlations between teacher competencies, such as didactics, knowledge, and relationship, and teacher performance as perceived by students. The study by Balsan, Faller and Pereira (2015), while emphasizing the transformation of individual learning into organizational competencies, also showed that the individual acquisition of competencies promotes the behavior change that, in the case of professors, becomes established in their interaction with the university environment and has repercussions on their performance.

These findings open space for studies that intend to test the relations between competence and performance of university professors from the perspective of the professors themselves. This study is based on the assumption that individual learning actions directed at work are driven by the need to demonstrate knowledge and skills required for their professional performance, which suggests that greater learning results in improved performance. However, it is believed that the direction and strength of this relationship can be influenced by organizational support.

This study enables the planning of learning actions in the organizational context, providing a conducive environment for teachers who want to acquire competencies in a more active way. It is expected that the learning acquired in the various domains of university teaching activities would have repercussions on their performance. In other words, the effectiveness of learning will also depend on later actions, in terms of generalization and transfer to other situations. Learning, strictly speaking, does not ensure performance; it is a condition for change (LE FRANÇOIS, 2008).

INDIVIDUAL LEARNING OF TEACHING COMPETENCIES

Learning can be defined as a process through which one acquires knowledge and skills that bring about changes in one's personal repertoire. Learning, therefore, is related to a relatively lasting cognitive, attitudinal, and behavioral change (ABBAD & BORGES-ANDRADE, 2014; BALSAN *et al.*, 2015). Competencies involve connecting knowledge, skills, and attitudes, and can be acquired or improved through learning processes (DURAND, 2000; LE BOTERF, 2006). In Zarifian's (2001) perspective, competencies also involve the capacity to put practical intelligence (supported by knowledge and attitudes) to use in dealing with various situations and actors of daily working life. It is by the quality of the performance that one can infer the mastery of a competence.

Professional learning stems both from a formal process, through attending specific courses and training events, and from the informal strategies adopted by the learner to accelerate the mastery of knowledge, skills, and attitudes and build a repertoire that ensures good performance and professional satisfaction. Learning through experience (JARVIS, 2006; KOLB, 1984; MUTTI, ALVIM, LOIOLA, GONDIM & BORGES-ANDRADE, 2015) is of fundamental importance in some professional activities, especially in the careers of university

professors who work in public institutions of higher education. Mastery of content and the classroom, the production of knowledge, extension activities, and especially in exercising management functions requires learning from the experience of engaging in each one of these activities. It is the experience that allows one to accumulate a repertoire, transfer learning from one context to another, and respond to or anticipate the diverse demands of work more rapidly.

This complex process of learning in the university context allows teachers to acquire skills to face similar situations, mobilizing multiple cognitive, attitudinal, and affective resources, in an integrated, rapid, pertinent, and creative way (Perrenoud, 2001). Identification of the competencies necessary for the broad and diversified practice that characterizes teaching in higher education can constitute an effective tool to diagnose gaps, facilitate the planning of professional development actions, and consequently improve the performance of teachers (BANDEIRA & SOUZA, 2014).

In discussing teaching competencies in higher education, Maduro (2013) states that the teaching profile required by the *PNG* (National Undergraduate Studies Plan) requires: a) scientific training in the knowledge area; b) a stricto sensu post-graduate degree, preferably at the doctoral level; c) mastery of the complex historical formation process of one's area; d) a broad and critical understanding of the methods that produced the accumulated knowledge; e) pedagogical competence. However, it is observed that the greater weight is being given to formal learning processes (a, b, c, and d). Only item "e" contemplates an aspect of extreme relevance for teacher performance in higher education, pedagogical competence, which develops strictly within the scope of practical experience. It is not enough to take courses in didactics of higher education, because it is the way in which teachers apply this knowledge, taking into account their conceptual mastery and the characteristics of the students, that reveals their performance as competent. In addition, this *PNG* profile leaves out the other activities that are part of the higher education teaching career, the competencies in research, extension, and management.

TEACHING PERFORMANCE

Performance is a complex construct to address (e.g., BENDASSOLLI & MALVEZZI, 2013; COELHO Jr., 2015; PEIXOTO & CAETANO, 2013). From one perspective, performance can be seen as a result or final product, which allows one to infer

the competence of the individual, the group, or the organization. In the case of university professors, one could say that performance is manifested in the activities developed: teaching, research, extension, and management. Well prepared classes that facilitate the learning process of the students are related to the professor's performance and allow one to infer the competencies (knowledge, skills, and attitudes) of this same professor. The ability to develop satisfactory research projects within the expected timeframes and resource constraints, producing articles and texts delivered at scientific events and published in related journals, constitutes the performance of the researcher-teacher, which allows one to infer this teacher's mastery of research competencies. Similar reasoning would apply to extension and management activities. However, professional performance is not restricted to end products, but also includes intermediate behaviors that contribute to this end product. These behaviors are often not directly related to the task, but contribute to it. For some authors this is considered extra-role behavior (e.g., Peixoto & Caetano, 2013). The ability to construct networks of relationships with other researchers can be understood as an extra-role behavior that contributes to the performance and the competence of the researcher. The attitude of collaboration with colleagues, replacing them in classes they might have to miss, contributes to the good performance of the undergraduate program and the university, and appears as another example of extra-role behavior.

Owing to this complexity, some authors affirm that in discussing performance, multiple factors are at stake, since performance also has an impact on the person and on the environment in which this performance is manifested. Thus, one can define performance more broadly by treating it as the set of characteristics, capacities, behaviors, and actions directed towards the achievement of personal and organizational objectives, which can be judged in terms of adequacy, efficiency, and effectiveness, and with significant implications for well-being and satisfaction (e.g., BENDASSOLLI & MALVEZZI, 2013). The key elements of performance are: attitudes, behaviors, and actions directed or not toward the task, limited to a broader social, professional, and organizational context, with impacts on the person and his/her environment.

Affective, attitudinal aspects, such as wanting to do something, being motivated, committed, and assigning meaning to the work are some of the subjective factors involved in teacher performance. In addition to the aspects pointed out, teacher performance is also evaluated by those who benefit from it. The good teacher enables

the students to learn, the good researcher allows the scientific or lay population to benefit from the knowledge produced and the results of the research, the good extension professor transfers the knowledge and technology produced in the university sphere to the surrounding population and community. The good teacher-manager contributes to the harmony between academic and bureaucratic processes, helping align means-related and end-related activity.

While defining performance is complex, its measurement is another major challenge for researchers. Authors such as Richard, Devinney, Yip and Johnson (2009) emphasize caution in the choice of performance measurement methods in order to avoid the use of low coverage measures in relation to the breadth and depth of the construct, and especially the need to take into account the characteristics in each context.

In the design of this study, whose results will be presented below, this is taken into account and, to the detriment of the usual methods of evaluation that consider the perspective of the students or of the numerical indicators, such as number of orientations, publications, and projects, we chose to understand teaching performance, considering the specificities of the main activities in the university context (teaching, research, extension, and management), based on the professor's self-perception. This option is supported by the assumption that the university professor has more autonomy in his/her learning process and proceeds based on the performance he/she hopes to achieve. By relying on the assumption that the teacher learns by undertaking and actively pursuing this learning, self-awareness is a key element in acquiring teaching competencies, with likely impacts on performance. Certainly, not every university professor starts with the expectation of taking on management functions, although these are included in their activities, and with that in mind, the *ASOD* inventory is designed to be dismembered, and thus address the specificities of each university context of professor activity, which will be more fully described in the method section.

Self-perception of teacher performance, although not a objective measure, is presented as a thermometer because, in dealing with an autonomous learner, it contributes to the individual's professional development and to institutional growth, helping to guarantee the achievement of qualitative and quantitative goals expected by society (Embiruçu, Fontes, & Almeida, 2010). One of the major difficulties, pointed out by Rodrigues and Peralta (2008) and Illeris (2011), concerning teacher performance is that it lacks a clearer demarcation.

The authors suggest a global reference matrix (*MRF*) that considers the nature of the educational institution and the expectations regarding the professor and the teaching and learning process; the professor's learning about how to teach; and how the knowledge constructed by teachers is applied to their professional practice.

In summary, the evaluation of teaching performance in university education contexts requires respecting the activities comprising one's area of responsibility, and maintaining involvement with the knowledge area, as well as the skills and attitudes required to carry out such activities. Although such specificities help delineate what teacher performance means in higher education institutions, one cannot disregard that, in addition to technical knowledge, skills, and attitudes, the higher education teacher is also an educator (GROHMANN & RAMOS, 2012). At this level of education, one of the principal missions of the teacher is to contribute to the development of conscious citizens capable of promoting their self-development based on values: commitment to the mastery of knowledge, ethical research production, and responsible professional performance.

Although it is recognized that university professors act more autonomously in their learning process, the specialized literature on learning at work highlights the importance of material and psychosocial support in the acquisition and transfer of competencies to the various facets of professional practice, which will be discussed in the next section.

MATERIAL AND PSYCHOSOCIAL SUPPORT IN THE ACQUISITION AND TRANSFER OF TEACHING COMPETENCIES

Organizational support for learning can be characterized as offering material and socio-environmental conditions that stimulate worker engagement in learning acquisition and transfer actions (e.g., ABBAD, PILATI, & BORGES-ANDRADE, 1999; BALARIN, ZERBINI & MARTINS, 2014). Material resources refer to the provision of better working conditions and tools that facilitate learning transfer. Beyond material support, the psychosocial environment involving leadership and co-workers is a strong stimulator for interpersonal exchanges of knowledge and skills, enhancing the practical application of the content learned (e.g., ABBAD, FREITAS & PILATI, 2006; ABBAD ET AL., 2012; BLUME, FORD, BALDWIN, & HUANG, 2010).

The recognition of the importance of organizational support places focus on the discussion that the result presented by the worker, when investing in new learning, is also related to how much the organization contributes for this learning to show results in new and better performance aspects. Authors such as Coelho Jr. (2015) point out that aspects such as the availability of materials, systematic support from leaders, and context have direct effects on the standard, the quality, and the type of performance.

The study developed by Dourado (2015) with technical staff of a federal institution of higher education concluded a favorable environment is necessary for the development of competencies, and also for the allocation of employees according to their training, knowledge, and individual skills, which is associated with increased perceived motivation, efficiency, and effectiveness. This implies that workers expect the organization to value the level of knowledge acquired and to provide more conditions for their development. The counterpart would be improved performance.

In the case of university professors, the strong affective link with the teaching career, which characterizes this occupational category (ROWE, BASTOS & PINHO, 2011), certainly serves as a stimulus and a continuous motivation for self-development, but this does not mean that, in fact, the teacher is willing to transfer and apply this knowledge. It is not uncommon to find teachers who invest heavily in their self-development without this necessarily resulting in improved teaching performance. In these cases, the transfer takes place in contexts outside the university and caters more to individual career interests than to the interests of the educational institution employer, which often invests in this self-development. The assumption is that the perceived presence of organizational support might enhance the relationship between acquisition of competencies and their transfer, that is, the application of learning in the work context, with benefits for students, colleagues, and the surrounding community, in addition to the impacts on image and organizational identity.

Authors such as Coelho Jr. and Mourão (2011) argue for the importance of investigating how psychosocial support occurs for learning derived from the interpersonal contact of colleagues, peers, and managers, and how such support can be strategically managed with a view to maximizing performance. This would be quite relevant in the case of teachers, given the importance of contact and exchange with students and colleagues, and does not mean that the

material support conditions would be neglected in the learning of competencies. Psychosocial support does not substitute for material support, since professors also expect to teach classes and carry out research and extension activities in adequate physical spaces, with the necessary materials and tools, and with sufficient human resources in number and quality to support them.

Those who embrace academic careers and go to work in higher education institutions are expected to find an environment conducive to their professional development and qualification. After all, teachers are responsible for the academic training of human resources for society and for the labor market; they are also responsible for transmitting values and offering models that will contribute to the general development of society. The organizational support expected by the teacher is, therefore, what makes the work in teaching, research, and extension possible. And in taking on functions of leadership, coordination, and direction, they should be offered training and appropriate conditions so that this exercise has a lower cost.

The relationship between competency learning and teaching performance in the context of university teaching practice is the main focus of the study described in this article. Two main objectives guided the design of the study. The first was to seek new evidence of the validity of the factorial structure of the inventory of learning, support, and performance of teachers (*ASOD*). The second was to test the moderating role of support for learning and for the transfer of teaching competencies in relation to performance.

To confirm the factorial structure of the ASOD, the following hypotheses were formulated:

H1: Learning activities predict teaching performance, as thus specified:

H1(a) - learning in teaching is a better predictor of performance in teaching;

H1(b) - learning in research is a better predictor of performance in research; H1(c) - learning in extension is a better predictor of performance in extension, and

H1(d) - learning in management is a better predictor of performance in management.

Another set of hypotheses was proposed to test relations of prediction and moderation:

H2: The organizational support for learning and transfer predicts the performance of teachers.

H3: The organizational support for learning and transfer moderates the relationships of teacher learning and performance, as thus predicted: H3(a) - teachers with higher indicators of learning in teaching present a greater perception of performance in teaching, especially those who perceive greater organizational support; H3(b) - teachers with higher indicators of learning in research present a greater perception of performance in research, especially those who perceive greater organizational support; H3(c) - teachers with higher indicators of learning in extension present a greater perception of performance in extension, especially those who perceive greater organizational support; and H3(d) - teachers with higher indicators of learning in management present a greater perception of performance in management, especially those who perceive greater organizational support.

Figure 1. Theoretical model of the hypotheses

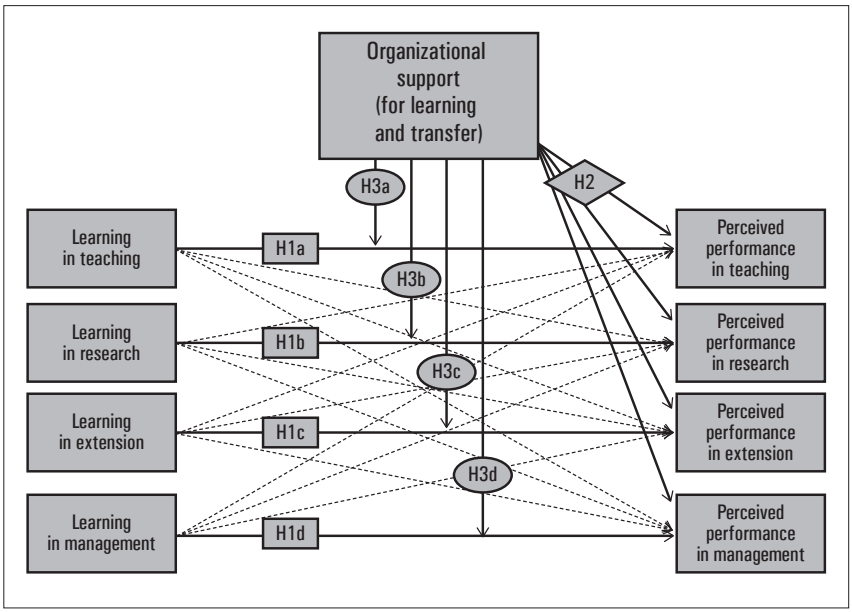


Figure 1. Prepared by the authors

METHOD

This is a correlational, cross-sectional study (CRESWELL, 2010). It is described as correlational, in that it explores the strength of association between the variables included in the study design. Since the data were collected at a single point in time, the study is characterized as cross-sectional.

PARTICIPANTS

A total of 275 university professors from a federal public institution in the northeast of Brazil participated in the study, with a majority being women (51.6%), with a mean age of 46 years (M = 45.9, SD = 10.1), and the predominant age group being 31 to 40 years (32.4%). The highest educational level is PhD (78.9%), with a predominance of one to ten years in the position (66.9%). Most work under an exclusive dedication arrangement (75.3%). As for the time devoted to each of the end-related teaching activities, measured on a scale from one to five, the means are as follows: teaching (M = 4.5; SD = 0.8), research (M = 3.8; SD = 1.2), management (M = 2.8, SD = 1.5), and extension (M = 2.6, SD = 1.3). The participation of the professors varied between academic units: biological sciences and health professions (36.0%), physical sciences, mathematics, and technology (29.1%), philosophy and human sciences/humanities (19.3%), interdisciplinary bachelor's programs (6.5%), letters/literature (4.7%), and arts (4.4%).

The size of the sample took into account the number of items on the largest scale (perceived performance, with forty items), requiring at least five participants per variable, resulting in a total of at least 200 respondents to make the confirmatory factor analysis feasible (FIELD, 2009; HAIR, BLACK, BABIN, ANDERSON & TATHAM, 2007).

INSTRUMENT

The Inventory of Learning/Competencies, Organizational Support, and Teacher Performance (*ASOD*) was developed by Pereira (2014), intended to relate competency learning and teacher performance, taking into account the main activities carried out by university professors in higher education institutions. The complete instrument is found in Pereira, Loiola and Gondim (2016). Table 1 shows the structure of the inventory and the reliability of the factors, according to results obtained by Pereira et al. (2016). There are four learning factors, one for each teacher activity: teaching, research, extension, and management, as well as four factors of perceived performance in the same activities: teaching, research, extension, and management. The assumption is that there is a direct positive association between each learning scale and its respective performance. The response scale is Likert-type, ranging from 1 to 5: very low (1), low (2), medium (3), high (4), and very high (5).

Table 1. Factorial structure of the ASOD

Factors/ Number of items	Description and example of item	Cronbach's Alpha[a]
Learning in teaching (8)	Intensity with which you acquired and/or improved competencies in teaching for the repertoire you already had (Ex: theoretical approaches related to the disciplines that I handle).	0.81
Learning in research (8)	Intensity with which you acquired and/or improved competencies in research for the repertoire you already had (Ex: strategies for dissemination of results (effects, products, and impacts) of scientific-technological research).	0.92
Learning in extension (8)	Intensity with which you acquired and/or improved competencies in extension for the repertoire you already had (Ex: strategies for dissemination of results (effects, products, and impacts) of scientific-technological research).	0.90
Learning in management (5)	Intensity with which you acquired and/or improved competencies in management for the repertoire you already had (Ex: in academic management).	0.88
Material support for transfer (4)	Availability of material necessary for the transfer of learning (Ex: the institution provided material resources in quantity for applying new skills and knowledge acquired).	0.92
Psychosocial support for transfer (4)	Social-emotional support for the transfer of learning. (Ex: I received praise from colleagues when I proposed changes to improve the work environment).	0.82
Performance in teaching (8)	Intensity with which you presented changes in behavior, considering the influence of the acquired competencies in teaching. (Ex: Updating the course syllabi at least once a year).	0.812
Performance in research (8)	Intensity with which you presented changes in behavior, considering the influence of the acquired competencies in research. (Ex: Updating the course syllabi at least once a year).	0.909
Performance in extension (8)	Intensity with which you presented changes in behavior, considering the influence of the acquired competencies in extension. (Ex: Updating the course syllabi at least once a year).	0.923
Performance in management (8)	Intensity with which you presented changes in behavior, considering the influence of the acquired competencies in management. (Ex: Updating the course syllabi at least once a year).	0.911

Note. Information taken from Pereira et al. (2016).

[a] Cronbach's Alpha is a coefficient of internal consistency created by Cronbach in 1951 and indicates the reliability of a measurement instrument. Reliability is demonstrated by the strength of the correlation between the responses given to the items of a measure, that is, the extent to which the measurement items measure the same concept or construct (Cronbach, 1951).

DATA COLLECTION PROCEDURE

Data collection was done through an electronic survey (survey monkey), whose link to the questionnaire was sent individually to the professors by e-mail. The e-mail also included the presentation of the research objectives, the free and informed consent form, and the identification of those responsible for the research. Of the 390 questionnaires registered in the database, 115 were discarded for not having been completed, resulting in a sample of 275 respondents.

DATA ANALYSIS

For data analysis, the statistical programs SPSS (Statistical Package for the Social Sciences) and AMOS (Analysis of Moment Structures; SPSS, IBM Company, Chicago, IL) were used. First, descriptive and central tendency analyses (mean, standard deviation, and frequencies) were run to characterize the sample. The assumptions of univariate and multivariate normality were considered following the guidelines of Field (2009) and Marôco (2014). After the specific tests, it was observed that the data distribution did not violate the normality assumptions. In other words, the distribution of measurement errors in the database is random and does not conform to a pattern (JUDD, MCLELLAND, & RYAN, 2009).

In addition to observing the overall fit, the intra-measure validity of the proposed model, i.e. the convergent and discriminant validity[1] (HAIR *et al.,* 2009), was verified. In the *ASOD* model, the premise is that each learning factor would be a predictor of all the performance variables. With this, it is possible to respond to the group 1 hypotheses. For the test of hypothesis 2, that organizational support (for learning and for transfer) predicts teacher performance, two procedures were carried out. The first was to verify the degree of relationship between the variables (FIELD, 2009) learning, support, and performance, using Pearson's correlation analysis. The weight of the regression of support on performance was evaluated using confirmatory analysis (SEM - Structural Equation Modeling) of the model for the test of the group 3 hypotheses.

In order to test the moderating role of organizational support in the relationship between individual competency learning and teacher performance, postulated in the group 3 hypotheses, SEM was used with latent variables (AMOS 19 - Analysis of Moment Structures; ARBUCKLE, 2010). The chosen method of estimation was maximum likelihood, and adjustment indicators helped evaluate the model.[2]

The antecedent variables tested in the proposed moderation model were the same ones tested in the confirmatory analysis, that is, those that had a higher factor loading. The procedure defined as parceling was also used on the moderator variable support, grouping its items into three parcels[3].

RESULTS AND DISCUSSION

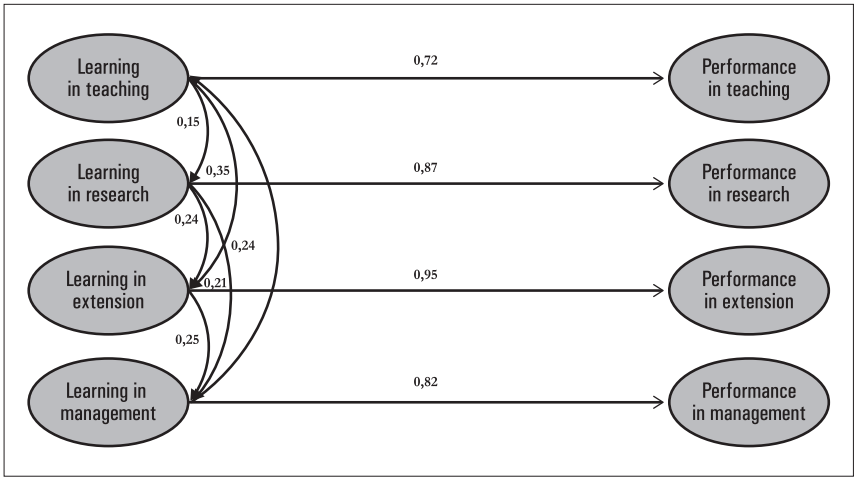
First, the results regarding the confirmation of the factorial structure of the *ASOD* (group 1 hypotheses) will be presented and discussed. Then in sequence, the tests of the prediction and moderation hypotheses (hypothesis 2 and group 3 hypotheses) will be presented.

FACTORIAL STRUCTURE OF THE *ASOD*: CONFIRMATORY ANALYSIS AND PREDICTIVE MODEL

To compose the structural model of the *ASOD*, four correlated learning variables were used (learning of teaching, research, extension, and management) that predict four perceived performance variables (in teaching, research, extension, and management). The first *ASOD* test showed an acceptable quality of fit (*X*²=433.506; gl=230; *X*²/gl=1.88; GFI=0.88; CFI=0.95; RMSEA=0.057 90%CI=0.049/0.065). Although there were no outliers and the asymmetry and kurtosis values were within the reference range (±3) (Field, 2009) and the modification indexes did not indicate changes, non-significant regression trajectories were identified.[4]

After conducting the initial *ASOD* assessment, non-significant regression trajectories were excluded from the model. The overall fit indicators, despite seeing a small decrease, remained acceptable (*X*²=497.495; gl=242; *X*²/gl=2.05; GFI=0.875; CFI=0.937; RMSEA=0.062 90%CI=0.054/0.07). In this new configuration, the values of the standardized regression coefficients[5] indicated that learning in teaching predicts performance in teaching (λ=0.72); learning in research predicts performance in research (λ=0.86); learning in extension predicts performance in extension (λ=0.95); learning in management predicts performance in management (λ=0.81). Learning in management predicts even the items that make up the latent factors of learning in teaching (λ=0.739-0.765); learning in research (λ=0.779-0.818); learning in extension (λ=0.735-0.843); learning in management (λ=0.680-0.931). Figure 2 presents the confirmatory factor analysis of the *ASOD*.

Figure 2. Representation scheme of the ASOD model tested using confirmatory factor analysis.



Note: Figure 2 shows the ASOD model representation scheme with four correlated factors that predict four additional latent factors. The image was elaborated by the authors based on the output from AMOS (Analysis of Moment Structures; Arbuckle, 2010).

After assessing quality by means of the fit indicators, the composite reliability (CR) and the convergent and discriminant intra-measure validities of the correlated four factors model were verified, these being the dimensions of learning. The composite reliability indicators were adequate for all dimensions,[6] and convergent validity was demonstrated[7] as well. In meeting the condition that the extracted variances (EV) of the factors be equal to or greater than the square of the correlations between the factors present in the analysis (MARÔCO, 2014), the discriminant validity was also confirmed.[8] Such results indicate that the measurement properly measures the constructs.

The result obtained in this study corroborates the study by Pereira *et al.* (2016), whose objective was to construct and evaluate the psychometric properties of a teacher perception inventory (*ASOD*) on competency learning, support for transfer to work, in addition to testing the relationship between learning and performance. In that study, the authors constructed and tested the *ASOD* inventory, and after analysis, concluded that the instrument is robust and capable of measuring the performance of teachers in various activities.

The result obtained in this study through structural equation modeling (MARÔCO, 2014) confirmed the *ASOD* inventory model of Pereira *et al.* (2016), which is formed by correlated dimensions of

learning (teaching, research, extension, and management), in addition to demonstrating the predictive impact of these dimensions on the teaching performance related to the corresponding dimension. The model fit well with the data collected among higher education teachers, which shows that there is an empirical basis for future investigations using this instrument. The activities of teaching, research, extension, and management direct the teaching practice in the university context (BRAZIL, 2012). The importance of delimiting these activities (teaching, research, management, and extension) as central among the competencies of teachers, lies in trying to ensure the quality of the work of teachers towards students in academic training (DIAS & LOPES, 2003). Teachers are essential to improving student learning, to enriching the quality of education and developing knowledge (MARCHESI, 2009).

RELATIONSHIP BETWEEN TEACHER COMPETENCY LEARNING, SUPPORT FOR TRANSFER, AND PERFORMANCE: TESTING PREDICTIVE AND MODERATION MODELS

The group 1 hypotheses (H1) of this study presupposed that each type of learning is a better predictor of teacher performance in its respective area (teaching, research, extension, and management). These hypotheses were corroborated, since each learning dimension proved to be an important predictor of performance in the same activity. Thus, the competencies acquired for the exercise of a given activity positively impact the performance of the corresponding activity: learning in teaching and performance in teaching;[9] learning in research and performance in research;[10] learning in extension and performance in extension;[11] learning in management and performance in management.[12]

This result is emphasized when considering the fact that the acquisition of competencies for the work of teaching is accomplished through learning processes (DURAND, 2000; LE BOTERF, 2006). Learning is capable of provoking lasting changes in teachers' personal repertoire of knowledge, skills, and attitudes (ABBAD & BORGES-ANDRADE, 2014; BALSAN *et al.,* 2015). These changes are evident through personal performance in the activities developed by the teacher. It is through the quality of performance that one can infer whether or not teachers master the competencies necessary to develop their work in the university environment (PEIXOTO & CAETANO, 2013).

After the analyses that validated the factorial structure of the instrument and corroborated the group 1 hypotheses (H1), the other hypotheses were tested using correlation analysis and confirmatory analysis, using structural equation modeling technique. The

confirmatory analysis of the model allowed us to test the weight of the regression of support in teacher performance, and its moderating role in the relationships between learning and performance. The results are described in the next section.

CORRELATIONS BETWEEN TEACHER LEARNING, SUPPORT, AND PERFORMANCE

To test hypothesis 2 (H2), the correlation table was initially used to analyze the strength of the association between teacher learning, support, and performance, and to also understand the magnitude and direction of the association between variables, Pearson's correlation analyses were conducted. Table 2 shows the relationships between the study variables. In relation to learning and to performance, strong positive correlations were found between learning in extension and performance in extension;[13] learning in research and performance in research;[14] and learning in management and performance in management.[15] In relation to learning in teaching and performance in teaching, a moderate positive correlation was found.[16] Although there is a negative correlation between learning in teaching and performance in research,[17] indicating that learning in teaching may be associated with a poorer performance in research, this correlation is weak. In other words, although the data suggest that an investment of learning in teaching may not have an impact on research activity, this was not shown to be strong among the professors who participated in the study. Regarding the relationship between the learning and support variables, as well as support and performance, the correlations were weak.

With respect to the analysis of the correlations, in addition to the already expected associations, with the higher positive correlations between the acquisition of competencies of a specific activity and the equivalent performance in this same activity, the findings suggest that there is a positive impact of the acquisition of competencies developed for the exercise of an activity on the performance of another activity, except for the inverse relationship between learning in teaching and performance in research. Despite the previously mentioned exception, this result means that the competencies acquired by the teacher may have a greater effect than expected, as they have impact on performance in other areas. For example, learning in extension correlates positively with performance in research.[18]

The previous analysis establishes that there is a significant relationship between the two variables, but does not establish causal

relationships. However, the inference that there may be a causal relationship finds grounds in the theory and analysis of the empirical work on learning, between the development of competencies and the subsequent improvement of performance of the individual (Abbad & Borges-Andrade, 2014; Abbad et al., 2006; Brandão, 2009; Grohmann & Ramos, 2012). Still in relation to learning in extension, the results corroborate the findings of Pereira (2014), who found that this learning maintained significant correlations with learning in management and performance in management, as well as performance in extension.

With respect to support, the study showed weak correlations with performance in all the activities, and there was no correlation with the research activity. The learning of competencies in extension was the one that presented the most positive correlations, with performance in teaching, performance in extension, and performance in management.

Table 2. Correlations between study variables (including mean and standard deviation)

Variables	LeTea	LeRes	LeExt	LeMan	PerTea	PerRes	PerExt	PerMan	Support
	3.49 (*SD*=0.87)								
LeTea	-	3.37 (*SD*=1.02)							
LeRes	0.142*	-	2.60 (*SD*=1.19)						
LeExt	0.239**	0.236**	-	2.70 (*SD*=1.13)					
LeMan	0.180**	0.188**	0.210**	-	3.27 (*SD*=0.91)				
PerTea	0.552**	0.190**	0.363**	0.095	-	3.30 (*SD*=1.16)			
PerRes	-0.027**	0.757**	0.221**	0.206**	0.060	-	2.19 (*SD*=1.13)		
PerExt	0.270**	0.156**	0.811**	0.201**	0.346**	0.131*	-	2.29 (*SD*=1.17)	
PerMan	0.221**	0.198**	0.330**	0.722**	0.196**	0.228**	03399**	-	2.61 (*SD*=0.76)
Support	0.309**	0.074	0.213**	0.211**	0.299**	0.104	0.272**	0.315**	-

Note. The numbers below each dimension indicate the mean and standard deviation of the variables. LeTea: Learning in Teaching. LeRes: Learning in Research. LeExt: Learning in Extension. LeMan: Learning in Management. PerTea: Performance in Teaching. PerRes: Performance in Research. PerExt: Performance in Extension. PerMan: Performance in management. Prepared by the authors.

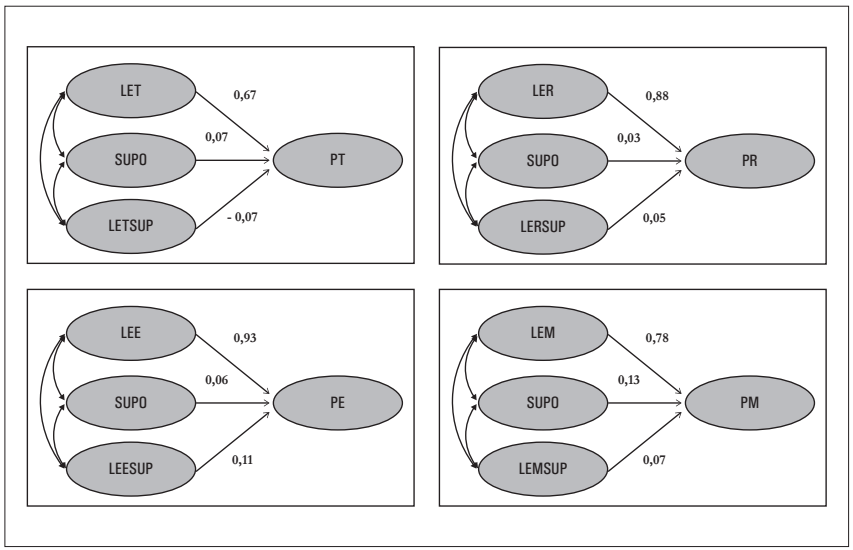
** Significance of $p < 0.001$

* Significance of $p < 0.05$

ORGANIZATIONAL SUPPORT AS A MODERATOR IN THE RELATIONSHIP BETWEEN TEACHER LEARNING AND PERFORMANCE

These latter results refer to the complementation of the test of hypothesis 2 (with respect to prediction) and the group 3 hypotheses (H3). Figure 3 shows the standardized estimates of the parameters of both the model of measures (factorial weights) and the structural model of moderation. The proposed model presents a good fit to the data, whether between learning and performance in teaching χ^2(gl=0.48; N=275) = 96.611 ps<0.001; χ^2/gl=2.013; GFI=0.946; CFI=0.959 and RMSEA (90% CI) =0.061 (0.043–0.078), or between learning and performance in research χ^2(gl=0.48; N=275) = 76.779 ps<0.001; χ^2/gl=1.600; GFI=0.956; CFI=0.982 and RMSEA (90% CI) =0.047 (0.026–0.066), or even between learning and performance in extension χ^2(gl=0.48; N=275) = 105.077 ps<0.001; χ^2/gl=2.189; GFI=0.942; CFI=0.968 and RMSEA (90% CI) =0.066 (0.049–0.083), and also between learning and management performance χ^2(gl=0.48; N=275) = 95.203 ps<0.001; χ^2/gl=1.983; GFI=0.946; CFI=0.975 and RMSEA (90% CI) =0.060 (0.042 – 0.077).

Figure 3. Moderation Model



Note: Figure 3 shows the test of the moderation of learning and support for learning and transfer on performance. The image was elaborated by the authors based on the output of AMOS (Analysis of Moment Structures; ARBUCKLE, 2010). LET: Learning in Teaching; SUPO: Support for learning and transfer; LETSUP: Interaction between learning in teaching and support for learning and transfer; PT: Performance in Teaching; LER: Learning in Research; LERSUP: Interaction between learning in research and support for learning and transfer; PR: Performance in Research; LEE: Learning in Extension; LEESUP:

Interaction between learning in extension and support for learning and transfer; PE: Performance in Extension; LEM: Learning in Management; LEMSUP: Interaction between learning in management and support for learning and transfer; PM: Performance in Management. Prepared by the authors. The values in the figures indicate the model regression trajectories.

The results only confirm the results of the test of the group 1 hypotheses (H1) of the *ASOD* structure. That is, all the learning dimensions have an effect on the performance dimensions: learning in teaching;[19] learning in research;[20] learning in extension;[21] and learning in management.[22] Regarding the role of support in teacher performance, although correlations were found between support and performance in management, teaching, and extension (see Table 2), in the confirmatory test, support appeared as a predictor only for performance in management (management - β=0.13, SE=0.050, p<0.05; teaching - β=0.07, SE=0.043, p>0.05; research - β=0.03, SE=0.041, p>0.05; extension - β=0.06, SE=0.044, p>0.05). In addition, support did not moderate the relationship between learning and perceived performance in the four dimensions, which indicates the rejection of the H3 group of hypotheses (a) (b) (c) (d) and (e).

The findings of this study are in line with the evidence, pointed out by several authors in organizations in the business world, that organizational support would be a an explanatory variable for the transfer of learning and skills, and therefore of performance (COELHO Jr. & BORGES-ANDRADE, 2011; COELHO Jr. & MOURÃO, 2011). Learning strategies and the expression of competencies would also be moderated by the perception of organizational support (BRANDÃO, 2009). They corroborate, however, results found by Pereira *et al.* (2016) in research focusing on a federal institute of higher education.

It can be said that the findings of this study suggest that university teaching work seems to be a personal and solitary investment (DIAS & LOPES, 2003; MADURO, 2013), which poses a problem about institutional responsibility in providing conditions for teachers to transfer what they have learned to their professional and academic activities.

CONCLUSIONS

Two main objectives guided the study described in this article. The first one was to seek, through a confirmatory factor analysis, new evidence of validation of the factorial structure of a measure created for the Brazilian context. The second was to test the moderating role of

organizational support in the transfer of competencies to performance. The findings show that there is evidence of validity of the factorial structure of the instrument in this sample of professors. Organizational support, however, did not prove to be a moderator in the end-activities of teaching. This last result replicates those found by Pereira et al. (2016) in a study at a federal institution of higher education.

The teaching performance of public higher education institutions in Brazil plays a strategic role in the scientific, educational, technological, and social mission of the universities. When taking into account teachers' multiple activities, in the spheres of teaching, research, and extension, they need to be engaged in a continuous learning process strongly aligned with their daily experience in the exercise of all these activities. In addition, teachers are required to take on new roles, such as that of manager, a little distant from the competencies most related to their end-activities. Certainly this breadth of professional practice poses challenges to one's own teaching performance, since the learning that ensures a mastery of competencies for one field of activity is not always easily transferable to another. Studies that seek to better understand the associations between the learning of competencies and teaching performance can contribute to the process of self-awareness of their learning, helping teachers to better choose their strategies. The results presented in this article clearly show that the learning related to extension offers better potential for transferring learning with impacts on the performance of other teaching activities. Paradoxically, teaching activities have negative impact on research activities, which challenges us to seek explanations for this result. Might the teaching competencies have specificities that would not make them easily transferable to the field of practical research activity? In future studies this could be more fully investigated.

The results also help in understanding that organizational support does not seem to play the same role as in other occupations, in the transfer of learning for professors. In this study, as previously mentioned, support did not moderate the transfer of the learning of competencies into teacher performance, corroborating a similar result already indicated by Pereira et al. (2016). Learning of competencies has greater power to predict performance than does support. This allows us to infer that the organizational support offered by the university institution is not perceived by the teacher as effective in making their investment in learning and development of competencies translate into better performance in terms of teaching,

research, extension, and management. One of the possible reasons may be that teachers who act in this context acquire an autonomy in their learning process, creating little expectation about the material and psychosocial support that the university might be able to offer.

In other words, the results could be explained again by the very nature of the work of higher education teachers in Brazil. The teachers tend to chart their learning goals and performance expectations relatively independently, possibly glimpsing other sources of support for their performance.

In summary, the confirmation of the multidimensional factorial structure of the *ASOD* instrument in a new sample of professors represents an important contribution, in addition to the evidence that the acquisition of competencies promoted by learning predicts perceived performance. Thus, it is expected to offer empirical support capable of sustaining learning promotion practices that will have an impact on performance, especially at the critical moment through which public universities are passing. In the current economic and political scenario of public institutions of higher education, great challenges are presented for university management.

LIMITATIONS AND SUGGESTIONS FOR FUTURE STUDIES

In relation to the limitations of the present research, it is worth mentioning that it was based on a methodological design preventing a collection over time. Therefore, it is not possible to establish causal relationships. Learning of competencies is a process and work experience plays an important role in this acquisition. Longitudinal studies could help to better understand the process of transferring learned competencies from one teacher to another. Another limitation is that the investigation was conducted in a single organization, a federal public university. Although there is some homogeneity in the context of federal public universities, due to geographic, contextual, or management issues, there may have been peculiarities in the results, which represents a challenge to the possibilities for their generalization. It must also be emphasized that the instrument was conceived based on professors perceptions of their performance, to the detriment of effective indicators of learning and performance, which are commonly used in the processes of functional progression and in the other evaluation processes in the teaching sphere.

We suggest for future studies, besides the application in different contexts, such as private higher education institutions, a

more in-depth verification of which types of learning better predict performance. We also recommend exploring, together with teachers, what elements of support, whether material or psychosocial, are considered the most important for learning and transfer. It is probable that the measure of organizational support used in this study may not be aligned with the expectations of university professors.

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NOTAS

[1] Intra-measure convergent and discriminant validities refer respectively to how much the measurement factors are correlated, belonging to the same construct, and how much they differ from one another, measuring distinct dimensions of the same construct.

[2] RMSEA (Root Mean Square Error of Approximation), with better fits for values close to 0.06 and 0.08; CFI (Comparative Fit Index), reference value >0.9, and GFI (goodness-of-fit index), reference value >0.9 (Marôco, 2014).

[3] Parceling is a measurement technique used in multivariate approaches and is characterized by aggregating manifested variables into parcels (Little et al., 2002).

[4] The standardized regression weights presented factor loadings below 0.5 (Marôco, 2014).

[5] Values of $\lambda \geq 0.5$.

[6] Composite Reliability (Le_teach = 0.79; Le_research = 0.84; Le_extension = 0.84; Le_manage = 0.88).

[7] Extracted Variance (Le_teach = 0.56; Le_research = 0.64; Le_extension = 0.63, and Le_manage = 0.72).

[8] Le_teach and Le_research: r=0.148/r^2=0.021; Le_teach and Le_extension: r=0.345/r^2=0.120; Le_teach and Le_manage: r=0.239/r^2=0.058; Le_research and Le_extension: r=0.236/r^2=0.056; Le_research and Le_manage: r=0.211/r^2=0.044; Le_extension and Le_manage: r=0.253/r^2=0.064.

[9] r = 0.552, p<0.001

[10] r = 0.757, p<0.001

[11] r = 0.811, p<0.001

[12] r = 0.722, p<0.001

[13] r = 0.811, p<0.001

[14] r = 0.757, p<0.001

[15] r = 0.722, p<0.001

[16] r = 0.552, p<0.001

[17] r =-0.027, p<0.001

[18] r =0.22, p<0. 001

[19] (β=0.720,SE=0.102,p<0.001).

[20] (β=0.931,SE=0.082,p<0.001).

[21] (β=1.005,SE=0.079,p<0.001).

[22] (β=1.039,SE=0.097,p< 0.001).

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