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Differential manifestation of teacher self-efficacy in Brazilian university professors in the health area

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Abstract— *Self-efficacy has occupied the research space due to the relevance it holds as an explanatory mechanism of human performance to understand the characteristics of the population, the study analyzed the differentiation of beliefs of self-efficacy of university professors who teach in the health area according to gender, marital status, age, seniority at work, religion and training graduate academic. A cross-sectional and quantitative study was attended by 189 university professors working in a private university in northeastern Brazil. The differentiation indicate that Women perceive themselves more self-effective in the elaboration of didactic strategies to favor interaction in class; older teachers consider themselves more effective in didactic strategies for the planning of classes and postdoctoral teachers stood out for the higher sense of self-efficacy regarding didactic strategies for class planning, didactic strategies to actively implicate students and didactic strategies to favor interaction in class. Self-efficacy as an explanatory mechanism of human performance is determinant and therefore it is important to be enhanced in university professors for the pursuit of a higher quality of teaching-learning of future health professionals.*

Keywords— *Self-efficacy, self-efficacy beliefs, university professors.*

I. INTRODUCTION

The concept of self-efficacy arises in the conceptual framework of Cognitive Social Theory [1,2] associated with individuals' perception of their ability to plan and perform the desired tasks [3-6]. This denotes that self-efficacy beliefs allude to each person's judgments about their ability to perform a particular activity.

The theory of self-efficacy [1] aims to demonstrate how people's cognitive, behavioral, contextual and affective aspects are conditioned by self-efficacy. For

this reason, they have gained a prominent place among the explanatory constructs of success and failure in human action [7-8]. Self-efficacy falls within one of the founding mechanisms of human agency [1-3]. The sense of "being an agent" symbolizes intentionality in the influence that the individual exerts on the functioning itself and on the circumstances of life itself [3].

By interfering with the exercise of control, self-efficacy beliefs influence people's performance, persistence and motivation to perform certain tasks.

Individuals are likely to perform activities in which they believe they have more capacity to succeed than tasks in which the sense of competence is evaluated by the individual as reduced. Thus, self-efficacy makes a difference in the way people feel, think and act and this is reflected in choices, conducts and performance [9].

The literature consulted highlights positive self-efficacy as a factor associated with personal success, professional satisfaction and successful individual experiences and work motivation [4, 6, 10-13], having a mediating role in the relationship between the overload and the dimensions of burnout in teachers [5]. Feelings of self-efficacy are highlighted by the significant relationship between burnout and academic teacher performance [14], availability for involvement in collaborative practices [15] and the remarkable impact on academic performance of teachers [16, 17]. Teachers, confident in their beliefs, with the potential to teach, research and manage, are the fundamental elements to improve the effective learning process [18] and to put into action their application capabilities of various didactic strategies, in particular those indicated as representative of university education, such as the planning of the teaching-learning process, the involvement of students in this process, the interaction and creation of a positive learning climate in the assessment of students' learnings [19]. On the other hand, the theory of self-efficacy [1] adds a collective dimension to the individual agency through a sense of shared effectiveness once people share knowledge, skills and resources, support each other, form alliances and work together to solve their problems and improve quality of life [20]. In fact, teachers, by understanding themselves more capable of developing their educational actions effectively [21] influence the level of persistence in the face of difficulties and the creation of higher expectations in relation to students [22]. Because it is a construct that does not only respect self-regulation and individual motivation, but which can become a collective phenomenon, with this study, it is intended to analyze the differentiation between teachers' beliefs of self-efficacy Brazilian university students due to sex, marital status, age, seniority at work and graduate academic training.

II. METHODS

2.1. Participants

A representative sample was used, composed of 36% of university professors from a universe of 530 [23], consisting of 189 teachers, 56 men (29.50%) and 133 women (70.40%). The mean age is 44.75 (SD = 9.94) and is between 27 and 77 years old. Of these, 31 aged 35 years

or less (16.40%), 75 aged between 36 and 45 years (39.70%), 55 in the 46 th and 55-year-old stagger (29.10%) and 28 aged 55 years or older (14.80%). It is noteworthy that 50% have less than ten years of teaching experience, 26.40% have 11-20 years of teaching work and 22.60% have 21 years or more of teaching service. As for the level of training, it is verified that 2.1% are specialists, 50.30% masters, 36% doctors and 11.60 post-doctors. We aggregate the specialists and masters, which makes up 52.40% in this category. As inclusion criterion was to be a university professor in undergraduate health courses at a private University in northeastern Brazil.

2.2. Instruments

Participants completed a questionnaire of sociodemographic and professional data built for this purpose and the self-efficacy scale of the university professor [24], in the Portuguese version. The Likert scale contains 44 quantitative type items, whose answers range from one to six and is divided into two domains: the first evaluates the beliefs in the capacities of each teacher by going the answers from "incapable" (1) to "very capable" (6); the second measures the beliefs of self-efficacy, and each of the answers varies between "never" (1) and "always" (6). The scale measures the dimensions: didactic strategies for planning classes, didactic strategies to actively implicate students; didactic strategies to favor interaction in class, and didactic strategies to evaluate learning.

2.3 Procedure

The descriptive, cross-sectional and inferential study was carried out after prior approval by the Ethics Committee (2,988,258) of Plataforma Brasil and signing the free and informed consent form of the participants. The data collected were processed in the computer program SPSS – *Statistical Package for Social Science*, version 22.0.

Exploratory data analysis was carried out so that we can safely determine what kind of statistical tests to use. In the present sample, the reliability indexes of the instrument were $\alpha = 0,836$ for didactic strategies for the planning of classes, $\alpha = 0,789$ for didactic strategies to actively implicate students, $\alpha = 0,823$ for didactic strategies to favor interaction in class and $\alpha = 0,824$ for didactic strategies to evaluate learning. The proportion of variability in the responses resulting from differences in respondents varies between reasonable and good, and therefore their permissible reliability [25].

Indications regarding the normality of variances were found in the four dimensions of the scale (*Kolmogorov-*

Smirnov, $p = 0,000$; Shapiro-Wilk, $p = 0,000$). Exploratory data analysis revealed that the assumptions underlying the use of parametric tests [25] were met. Considering the objective of the study, the analysis of the data focused on the use of the difference's tests. Student's Test T, inter-subject design and Unifactorial variance analysis (ANOVA) Unifactorial (One-Way Analysis of Variance, F), inter-subject design [25] were used, given that the results make it possible to make inferences. Ethical procedures, correct reference, voluntary participation, anonymity and confidentiality of data were fulfilled.

III. RESULTS

The differential results according to gender indicate statistically significant differences in the level of didactic strategies $t(187) = -2,197, p = 0,029$. That is, women ($N = 133; M = 89.33; SD = 5.85$) self-perceive themselves more capable of performing didactic strategies to favor interaction in class in their academic context than men ($N = 56; M = 87,11; SD = 7,43$) (Table 1).

Table. 1: Distribution of self-efficacy of university professors as a function of sex

Dimensions	Sex	N	M	SP	t	df	p
Didactic strategies to favor interaction in class	Male	56	87,11	7,15	-2,197	187	0,029
	Femeal	133	89,33	7,02			

Source: this table was development based on the SPSS analysis.

The marital status did not indicate significant differentiation ($p < 0.050$) in relation to representations of teacher self-efficacy in any dimension of the scale measured.

Regarding age, the study shows that teachers, in the age group "56 years or older" ($N = 28; M = 135.39; SD = 11.24$), more self-effective perceptions of didactic

strategies for the planning of classes [$F(3, 186 - 4 = 6.026), p = 0.001$] than teachers aged 35 years or less ($N = 31; M = 125.10; SD = 11.71$) and aged between 36 and 45 years ($N = 72; M = 127.39; SD = 11.50$) (Table 2).

Table. 2: Distribution of self-efficacy of university professors according to age

Dimensions	Age	N	M	SP	P	df	F	ANOVA
Didactic strategies for planning classes	≤ 35	31	125,10	11,70	0,002	3	6,026	0,001
	≥ 56	28	135,39	11,24				
	36-45	72	127,39	11,50	0,005			
	≥ 56	28	135,39	11,24				

Source: this table was development based on the SPSS analysis.

Regarding antiquity, it was observed that the group of most experienced teachers, framed in the 11-20 years age ($N = 46; M = 131.50; SP = 8.47$) and those with 21 or more years of experience ($N = 43; M = 131.70; SP = 8.79$) more self-effective perception swells in the field of didactic strategies for planning classes [$F(2, 178 - 3 = 5.516), p = 0.005$] than less experienced teachers, this is 10 years or less of service ($N = 90; M = 126,51; SP = 11,60$)

(Table 2). Differentiation was also evident in relation to the didactic strategies dimension to actively implicate students, to favour teachers with 11-20 years of experience ($N = 48; M = 10.85; SD = 11.74$) when compared to the less experienced ($N = 91; M = 95,48; SP = 8,02$), [$F(2,181 - 3 = 5,724), p = 0,004$] (Table 3).

Table. 3: Distribution of self-efficacy of university professors depending on antiquity

Dimensions	Antiquity (Years)	N	M	SP	p	df	F	ANOVA Sig
Didactic strategies for planning classes	≤ 10	90	126,51	11,60	0,021	2	5,516	0,005
	11-20	46	131,50	8,47				
	≤ 10	90	126,51	11,60	0,019			
	≥ 21	43	131,70	8,79				
Didactic strategies to actively implicate students	≤ 10	91	95,48	8,02	0,003	2	5,724	0,004
	11-20	48	100,85	11,74				

Source: this table was development based on the SPSS analysis.

Regarding academic formation, the results suggest significant intergroup differences [F(2,185) – 3 = 5.497, p = 0.005], with postdoctoral studies being the highest levels (Table 4). Tuckey's Post Hoc test revealed that postdoctoral teachers (N = 21; M = 136.67; SP = 6.57) perceive higher self-efficacy beliefs in the field of didactic strategies for planning classes than doctoral teachers (N = 67; M = 127.91; SP = 10.30) and then non-doctorates (N = 98; M = 128.79; SP = 11.87). Regarding didactic strategies to actively implicate students [F(2,188) – 3 = 4.625, p = 0.011], postdoctoral teachers (N = 22; M = 102.77; SP =

16.17) report higher self-efficacy beliefs than doctorates (N = 68; M = 96.94; SP = 7.30) and then non-doctorates (N = 99; M = 96.54; SP = 7.48). The study also revealed significant differences in the level of didactic strategies to favor interaction in class [F(2,186) – 3 = 4.638, p = 0.011]. That is, postdoctoral teachers (N = 22; M = 91.18; SP = 6.42) showed higher self-efficacy beliefs than doctorates (N = 68; M = 86.99; SP = 7.17). However, it did not expose differentiation related to beliefs in didactic strategies to assess learning (p = 0.073) depending on the level of training of participants.

Table. 4: Distribution of self- efficacy of university due to academic training

Dimensions	Academic level	N	M	SP	p	df	F	ANOVA Sig.
Didactic strategies for planning classes	No Doctor	98	128,79	11,87	0,008	2	5,497	0,005
	Post-Doc	21	136,67	6,57				
	Doctor	67	127,91	10,30	0,004			
	Post-Doc	21	136,67	6,57				
Didactic strategies to actively implicate students	No Doctor	99	99,54	7,48	0,009	2	4,625	0,011
	Post-Doc	22	102,77	16,17				
	Doctor	68	96,94	7,29	0,021			
	Post-Doc	22	102,77	16,17				
Didactic strategies to favor interaction in class	Doctor	68	86,99	7,17	0,020	2	4,638	0,011
	Post-Doc	22	91,18	6,57				

Source: this table was development based on the SPSS analysis.

IV. DISCUSSION

The results found from the application of the instrument created by Prieto (2007) were analyzed as a function of the objective of the research assumed, namely, the differential manifestations of the self-efficacy of Brazilian teachers, due to gender, of marital status, age and academic formation and fall within the specific, differentiated and particularizing character [1]. The results indicated differentiation in teacher self-efficacy associated with gender at the level of didactic strategies to favor interaction in class, benefiting female teachers. This disagrees with Martín [26] who found no differences in this area between Spanish and Italian university professors. Also, the study by Covarrubias and Mendonza [10] did not demonstrate gender as a variable that differentiates feelings of teacher self-efficacy between males and females. This evidence allows us to consider the importance of future investigations that compete to patent the intrinsic or extrinsic factors that contribute to teachers holding the beliefs of higher self-efficacy than men when deals with the didactic strategies dimension to favor interaction in class.

It was possible to perceive greater teacher self-efficacy at the level of didactic strategies for planning classes according to the age of the participants, always in favor of the higher age level. These differences may be closely associated with the interpretation of previous personal experience [1]. That is, successful experiences tend to develop or sustain beliefs about the individual's ability to engage in certain tasks, generating subsequent influence on motivation and persistence to engage in tasks of the same domain.

Antiquity also emerged in this study as a differentiating variable in the perception of self-efficacy at the level of didactic strategies for planning teaching classes and didactic strategies to actively implicate students. it is possible to realize that less experienced university professors feel less effective. Martín's study [26] showed no significant differences between these professionals due to antiquity. The findings allow us to deduce that self-efficacy beliefs are determined by several personal, intrinsic, extrinsic and/or contextual factors, whereas by the collective effect of the phenomenon [20] require to be revealed with a view to promoting teacher self-efficacy among university professors.

Although the literature refers to the importance of self-efficacy beliefs in successful personal experiences, job satisfaction and motivation [4, 6, 11-13], persistence and positive expectations [22] and involvement and

collaboration [15], studies on the academic training of participants, which allow corroborating or contrasting the results obtained and better accessing knowledge about this professional group are scarce or non-existent, deserving this area their deepening through new studies.

Focusing attention on the training of university professors, the study of Vizcayo, López e Klímenko [19] pointed out that most teachers feel able to use various didactic strategies, although the relationship between self-efficacy beliefs and their performance varies from one dimension to another.

In this study, it was found that teachers with postdoctoral training significantly more positively evaluate didactic strategies to actively involve students and didactic strategies to favor interaction in class, what in our opinion presupposes the relevance and originality of the study under consideration in the knowledge of this professional group. High levels of teacher self-efficacy are positively associated with performance [17] and with the findings, it is admitted that the most qualified teachers tend to evidence and seek to maintain a high awareness of self-efficacy at work.

V. CONCLUSION

The study reveals several differential manifestations of self-efficacy according to gender, age and academic education among university professors. That is, women perceive themselves more competent in the field of didactic strategies to promote interaction in class, older teachers consider themselves more effective in developing didactic strategies for planning classes and postdoctoral studies stood out by the higher sense of self-efficacy in relation to didactic strategies for planning classes, didactic strategies to actively implicate students and didactic strategies to favor interaction in class. This fact, revealing the importance of continuing teacher training.

Considering the results expressed in this study, it is deduced that it would be advantageous to facilitate the continuous training anchored in the development of the sources of information of self-efficacy. That is, direct experiences, vicarious learning, persuasion and physiological and emotional states, as well as the sharing of practical experiences that allow to expand self-efficacy in domains such as didactic strategies for planning of classes, didactic strategies to actively implicate students, didactic strategies to favor interaction in class and didactic strategies to evaluate learning, essential dimensions for improving the quality of university education.

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