

QUALITY OF LIFE: CLUSTER ANALYSIS ON PHYSICAL EDUCATION TEACHERS

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ABSTRACT: Quality of life (QL) profiles are analyzed and associated with the sociodemographic characteristics of Physical Education teachers. The sample was composed of 297 teachers from government-run schools in the meso-region of Greater Florianópolis, Brazil. A sociodemographic questionnaire and the Whoqol-bref were applied. Cluster analyses by the Ward method were conducted according to the teachers' QL profiles. A subjective analysis of the dendrogram of the statistical test was used to determine the number of groups that should be established. Inferential statistic tests comprised Chi-Square, Mann-Whitney U test and Kruskal-Wallis with Dunn's post hoc. Cluster results determined four profiles of teachers: Cluster 1 (72 teachers) presented a more positive perception (74.4) and Cluster IV (39 teachers) showed a more negative QL perception (47.3%). Significant association between sociodemographic characteristics and QL profiles were found for gender ($p=0.047$), vital cycles ($p=0.043$), service time ($p=0.030$), teaching as primary income ($p=0.054$) and having another source of income ($p=0.033$). QL profiles revealed four groups of Physical Education teachers working in schools in the Greater Florianópolis region: Group I with more positive perception of QL; groups II and III with more medium scores; and group IV with rates closer to a negative perception of QL.

KEY WORDS: Education, Primary and secondary; Faculty; Health.

QUALIDADE DE VIDA: ANÁLISE DE AGRUPAMENTOS DE PROFESSORES DE EDUCAÇÃO FÍSICA

RESUMO: Investigar os perfis de qualidade de vida (QV) e associá-los às características sociodemográficas de professores de Educação Física. A amostra constituiu-se de 297 professores de escolas públicas da mesorregião da Grande Florianópolis. Aplicou-se um questionário sociodemográfico e o Whoqol-bref. Foram realizadas análises de *Clusters*, pelo método *Ward*, considerando os perfis de QV dos professores. Para determinar o número de grupos que deveriam ser estabelecidos foi empregada a análise subjetiva do dendrograma do teste estatístico. Os testes estatísticos inferenciais foram Qui-quadrado, Prova U de *Mann-Whitney* e *Kruskal Wallis* com *post hoc* de *Dunn*. Os resultados dos agrupamentos determinaram quatro perfis de professores: Grupo I (72 professores) apresentou percepção mais positiva (74,4) e Grupo IV (39 professores) demonstrou percepção mais negativa da QV (47,3). A associação significativa das características sociodemográfica com os perfis de QV foram sexo ($p=0,047$), ciclos vitais ($p=0,043$), tempo de serviço ($p=0,030$), docência como renda principal ($p=0,054$) e ter outra fonte de renda ($p=0,033$). Conclui-se que os perfis de QV revelaram quatro grupos de professores de Educação Física atuando em escolas da região da Grande Florianópolis: Grupo I percepção mais positiva da QV; grupos II e III escores mais regulares; e grupo IV valores mais próximos a uma percepção negativa da QV.

PALAVRAS-CHAVE: Docentes; Ensino fundamental e médio; Saúde.

INTRODUCTION

Quality of Life (QL) features an important investigation trend and may be discussed from different points of view, perspectives and scientific fields¹, which may involve medical, economic, sociopolitical, psychological and humanistic aspects². QL's self-evaluation rates are a great aid in the assessment of general results for physical, mental and social well-being. In fact, it is a relevant marker related to public health policies³, because these factors are key-indicators of general psychological welfare⁴.

In this scenario, self-perception on health status or a 'bad' or 'negative' QL is associated with double mortality risk when compared to people who have a healthy perception or whose QL is 'excellent' or 'positive'³. Since QL may be affected by the variables gender, socioeconomic level, age, disease, behavioral and environmental risk factors³ and work may be a determining factor in human life due to it being a deteriorating element⁵, interest in research on QL of teachers in government-run schools is highly appropriate⁶.

Within the educational context, it may be said that school teachers' QL is on the decline⁷, since the teacher class has a greater number of tasks, duties and stress factors in their day to day routine⁸. Further, their personal and professional respect has decreased significantly⁹. On the other hand, an increase in the QL positive perception by the teacher is markedly an important factor which may cause an improvement in the quality of Education. This is due to the fact that these professionals with a better QL will have greater stimuli to contribute towards a better education in Brazil¹⁰.

It is a well-known fact that the teacher has a fast work rhythm: planning and giving lectures, discussions on the curriculum, evaluation of students, participation in school administration, frequently a member of school or community committee, all of which may trigger physical and mental wear⁸. Deterioration may cause teachers to absent themselves from work due to health problems and, consequently, produce a high economic cost for school reorganization because of the hiring of new teachers by

school institutions for their replacement¹¹. Consequently, the teacher class is one of the categories that have undergone health and QL damages. The evaluation of the perception of the QL of teachers in Primary Schools is of paramount importance to improve work conditions and avoid risk factors with negative influences¹².

Studies on teachers' QL abound, albeit with differentiated themes and focuses, such as perception of QL^{3,13-16}; level of physical activity and QL^{14,15}; QL and voice^{17,18}; social support and QL⁴. Data from the above studies reveal that teachers have produced medium QL rates and evidence that teachers with a more positive perception are those who practice physical activities, have higher economic level and greater social support by friends and kin.

However, it should be underscored that the above studies have investigated teachers' QL from analyses of the results of groups as a whole, without taking into consideration the similarities and differences in the perception of QL within the sampled agents. Taking this fact into account and the interest in investigating teachers' QL within a specific geographic area, current analysis determines the QL profiles of Physical Education teachers of the meso-region of Greater Florianópolis SC Brazil, and associate QL profiles with their sociodemographic characteristics.

METHODOLOGY

Current descriptive, transversal and quantitative study was undertaken in the meso-region of the Greater Florianópolis, state of Santa Catarina, Brazil, with 21 municipalities. Seventeen Educational Municipal Secretaries (municipal teaching network) and 13 municipalities linked to the Regional Coordination of the Greater Florianópolis (statal teaching network) participated in current research.

Total number of the region's Physical Education teachers reached 368 teachers in government-run schools belonging to the municipal (218) and statal (150) education networks. Taking into account five percentage points as sampling error, a sample of 190 teachers of Physical Education had to be employed, with 113 and 77 teachers respectively from the municipal and statal

networks. The non-probabilistic and convenience sample reached 297 teachers of Physical Education, with 159 teachers in municipal schools and 139 teachers in state schools. However, a new calculation was undertaken with 2.49 percentage points as sampling error.

Two tools were employed for the collection of data, namely, a self-applied sociodemographic questionnaire was prepared for the study, composed of 15 items on the teachers' personal (gender, age, marital status) and professional (teaching network, town, service time, type of working contract, income sources, teaching level, number of schools, total work load and total load in the network) data.

The Whoqol-bref questionnaire, translated and validated for conditions in Brazil to evaluate QL was employed¹⁹, with 26 questions (general QL, physical, psychological, social relationships and environmental dominions), with response possibilities within a 1 – 5 ordinal scale. The instrument's assessment is performed by proper syntax and final scores may be transformed in a scale ranging from 0 to 100. The closer to 0, QL is negative and the closer to 100, QL is positive. Whoqol-bref validation process revealed satisfactory internal consistency (0.91), discriminating validity, criteria validity, concurring validity and test-retest reliability¹⁹.

Data on population size and IHD of each municipality were retrieved from the IBGE site with regard to the town where the teacher worked (data retrieved from sociodemographic questionnaire).

The first step in data collection comprised an introduction to the study, petition to authorize research and the number of PE teachers directly demanded from representatives of the Education Municipal Secretaries and the Regional Coordination of the Greater Florianópolis. The second step comprised the appreciation of research by the Committee for Ethics in Research with Human Beings (CEPSH) of the Universidade do Estado de Santa Catarina (UDESC), n. 2.339.574/2017.

Data were collected during October and November 2017 with PE teachers, according to schedule of the Municipal Secretaries of Education and the Regional Coordination of the Greater Florianópolis:

- Mailing (13 municipal networks and isolated state schools): sending of questionnaires and the Term of Free Consent (TFC) in an envelope identifying current research and distributed by the secretaries through the inter-school mailing service. After filling the documents, the teachers sent their responses to the secretaries in sealed envelopes to be retrieved and opened by the researchers;
- Continual Training Meetings (two municipal networks): the presence of four researchers in periodic meetings organized by secretaries, to which teachers were invited to participate. Questionnaires and TFC were given to the teachers prior to the meeting and were filled individually by researchers before the start of training;
- Schools (one from the municipal network and schools close to the state network): initial contact with head teachers who received questionnaires and TFCs, passing them to PE teachers who, after filling the forms, returned them to the head teachers in sealed envelopes which were received and opened by the researchers.

Data analysis was undertaken with an electronic sheet Microsoft Excel 2016 for the categorization of data on sociodemographic facts. After data categorization, the Kolmogorov-Smirnov test revealed no normality of data. Data analysis was undertaken with resources of descriptive and inferential statistics by SPSS statistic package 20.0.

Cluster Analysis was undertaken by the Ward method so that teachers' group could be determined according to information of the QL construct. Cluster analysis grouped items with common characteristics and established a classification standard, according to characteristics presented by the Clusters formed, identifying groups with homogeneous characteristics²⁰. Therefore, Clusters reunited individuals in groups with similar characteristics²¹. A subjective analysis of the dendrogram of the statistical test was employed to determine the number of groups which should be established²². Chi-square, Kruskal-Wallis and Dunn's

post hoc tests were performed for the association of independent and dependent variables, at 95% significance ($p < 0.05$).

RESULTS

The evaluation of QL profiles among PE teachers revealed four distinct groups in the region of Greater Florianópolis, namely, 72 in Group I; 90 in Group II; 96 in Group III; and 39 in Group IV. At the top of Figure 1, one may perceive that teacher sample was at first divided into two groups and subsequently each group was divided into two other groups, totaling four groups of teachers.

When the four groups established by Cluster Analysis were compared to general perception and QL domains, there were significant differences in all variables (Table 1). Group I evidenced the highest scores in QL evaluation, with positive perception in general QL and in QL domains, with the exception of the physical domain with medium rates. Group II revealed medium rates for general QL and QL domains, with the exception of positively perceived social relationships. Group III had medium rates with lower scores for the environment domain, whilst Group IV demonstrated the lowest scores in QL evaluation, getting closer to negative perception, particularly for the psychological domain.

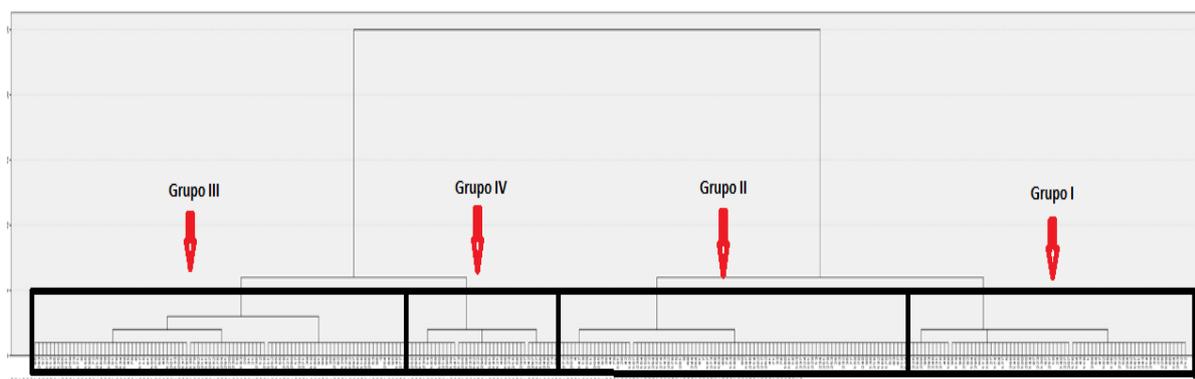


Figure 1. Dendrogram of Cluster Analysis by evaluation of QL dominions.

Table 1. QL profiles of Physical Education teachers

Life Quality domains	Group I Md (Q1-Q3) n=72 (24.2%)	Group II Md (Q1-Q3) n=90 (30.2%)	Group III Md (Q1-Q3) n=96 (32.2%)	Group IV Md (Q1-Q3) n=39 (13.1%)	P*
Physical	64.3 (60.7-71.4)a	57.1 (53.6- 64.3)b	50.0 (46.4- 57.1)c	46.4 (42.9- 50.0)d	<0.001
Psychological	75.0 (66.7- 79.2)a	66.7 (62.5- 75.0)b	62.5 (58.3- 66.7)c	41.7 (41.7- 50.0)d	<0.001
Social relationships	91.7 (83.3- 100.0)a	75.0 (66.7- 75.0)b	66.7 (58.3- 75.0)c	50.0 (33.3- 58.3)d	<0.001
Environment	71.4 (64.3- 77.7)a	64.3 (60.7- 71.4)b	43.6 (42.9- 60.7)c	46.4 (39.3- 57.1)c	<0.001
General	74.4 (71.1- 78.4)a	65.9 (63.5- 68.5)b	58.2 (55.5- 60.4)c	47.3 (41.1- 50.7)d	<0.001

Legend: *Probability estimated by Kruskal Wallis test; letters "a", "b", "c" and "d" indicate differences between groups by Dunn's post hoc multiple comparison test. Rates in bold demonstrate significance.

Table 2 shows QL profiles of PE teachers in Greater Florianópolis for sociodemographic features. Data showed significant association of Groups I and II with gender (female < male), vital cycles (40 to 49 years > up to 39 years or above 50 years and 30 to 39 years > up to 29 years or above 40 years, respectively), service time (up to 3 years > 4 years or more) and having another income source (no < yes). There was a significant statistical difference in Groups III and IV, with gender (female > male), vital cycles (III: 30 to 39 years > up to 29 years or above 40 years; IV: 40 to 49 years > up to 39 years or above 50 years), service time (III: up to 3 years > 4 years or more; IV: 4 years to 10 years > up to 3 years or 11 years or more) and having another income source (no < yes).

Table 2. QL profiles of Physical Education teachers taking sociodemographic features into account

(Continua)

Sociodemographic variables	Group I n (%)	Group II n (%)	Group III n (%)	Group IV n (%)	p*
Gender					
Female	33 (45.8)	39 (43.3)	60(62.5)	20(51.3)	0.047
Male	39(54.2)	51(56.7)	36(37.5)	19(48.7)	
Marital status					
With partner	42(58.3)	62(70.5)	61(65.6)	28(71.8)	0.354
Without partner	30(41.7)	26(29.5)	32(34.4)	11(28.2)	
Vital cycles					
Up to 29 years	19(26.8)	25(28.4)	20(20.8)	3(7.7)	0.043
30 - 39 years	18(25.4)	30(34.1)	42(43.8)	13(33.3)	
40 - 49 years	22(31.0)	18(20.5)	24(25.0)	17(43.6)	
50 years or more	12(16.9)	15(17.0)	10(10.4)	6(15.4)	
Teaching milieu					
State school	36(50.0)	39(43.3)	44(45.8)	19(48.7)	0.847
Municipal school	36(50.0)	51(56.7)	52(54.2)	20(51.3)	
Labor type					
Permanent	31(43.1)	37(41.6)	51(53.1)	21(53.8)	0.300
Substitute	41(56.9)	52(58.4)	45(46.9)	18(46.2)	
Teaching level					
1 level	55(76.4)	58(64.4)	69(71.9)	26(66.7)	0.378
2 or more levels	17(23.6)	32(35.6)	27(28.1)	13(33.3)	
Work shift					
Day	61(84.7)	69(77.5)	83(86.5)	36(92.3)	0.153
Morning and evening	11(15.3)	20(22.5)	13(13.5)	3(7.7)	
Service time – network					
Up to 3 years	35(49.3)	42(48.3)	39(40.6)	9(23.1)	0.030
4 - 10 years	17(23.9)	23(26.4)	38(39.6)	15(38.5)	
11 - 20 years	10(14.1)	18(20.7)	15(15.6)	11(28.2)	
21 years or more	9(12.7)	4(4.6)	4(4.2)	4(10.3)	

(Conclusão)

Sociodemographic variables	Group I n (%)	Group II n (%)	Group III n (%)	Group IV n (%)	p*
Total work load					
Up to 29 hours	12(16.9)	10(11.1)	10(10.4)	5(12.8)	0.595
30 - 39 hours	15(21.1)	16(17.8)	15(15.6)	4(10.3)	
40 hours or more	44(62.0)	64(71.1)	71(74.0)	30(76.9)	
Network work load					
Up to 29 hours	25(34.7)	27(30.0)	18(18.8)	14(35.9)	0.264
30 - 39 hours	17(23.6)	21(23.3)	23(24.0)	8(20.5)	
40 hours or more	30(41.7)	42(46.7)	55(57.3)	17(43.6)	
Teaching as Main Income Source					
Yes	55(76.4)	74(85.1)	88(91.7)	32(82.1)	0.054
No	17(23.6)	13(14.9)	8(8.3)	7(17.9)	
Other income source					
No	38(52.8)	49(55.1)	69(71.9)	21(53.8)	0.033
Yes	34(47.2)	40(44.9)	27(28.1)	18(46.2)	
Human Development Index					
Up to 0.799	43(59.7)	54(60.0)	53(55.2)	16(41.0)	0.207
Over 0.800	29(40.3)	36(40.0)	43(44.8)	23(59.0)	
Population of the Municipality					
Up to 50,000	22(30.6)	35(38.9)	29(30.2)	6(15.4)	0.203
51,000 – 199,000	21(29.2)	19(21.1)	24(25.0)	10(25.6)	
200,000 or more	29(40.3)	36(40.0)	43(44.8)	23(59.0)	

*p – estimated probability by chi-square test; **CDP – Classification by Farias et al. (2018). Rates in bold demonstrate significance.

DISCUSSION

Current study determined QL profiles of Physical Education teachers. Four distinct groups of teachers were detected, with Group I with a more positive QL perception, whilst Groups II and III with medium rates; Group IV evidenced rates close to a negative QL perception. One should underscore that, although several teachers demonstrated a negative QL perception, the latter are few when compared to the others. In fact, Group IV (lowest scores in QL evaluation) was composed of only 39 teachers, whilst 72 teachers belonged to Group I with a more positive perception; 186 teachers belonged to Groups II and III with medium QL perception.

Medium scores in QL evaluation by Groups II and III were closer to rates predominantly given in

scientific publications on QL of teachers of different areas of knowledge in Basic Education^{12,13,18,23,24}. Further, a positive evaluation of QL undertaken by Group I teachers and a more negative one by Group IV teachers were not corroborated by published studies when teachers were taken as a whole or when they were not grouped according to similar rates they provided. QL indexes with the highest non satisfaction rates by Primary School teachers, especially Group IV, indicate the need to analyze the health of this group to avoid possible absences in schooling activities¹².

High rates of QL positive evaluation by Group I corroborate other studies which also published the perception of teachers' QL in a single group²⁵. However, low perception rates and QL by Group IV are significantly lower than those published in the literature. Results

show the importance of QL analysis by groups with similar results, respecting the different perception and avoiding the masking of groups which do not comply positively or negatively. In fact, results may lie hidden when participants are placed within a single group.

It is greatly relevant to underscore that grouping analysis may provide a more fine-tuned information of the sample, with a better base for the study's dependence relationships and the avoidance of bias in results²⁶. Further, low QL perception scores, even by a small group (Group IV – 39 teachers), and the medium scores of Groups II and III (significant number of teachers – 186) may indicate adverse subclinical effects³. That is why care and the elaboration of recommendation of effective actions should be undertaken by the Education Secretaries for the improvement of QL of this group of teachers, with positive impacts on their perception.

Current study also aimed at associating QL profiles with sociodemographic characteristics of PE teachers. In fact, gender and vital cycles were the personal characteristics that differentiated teachers' QL profiles. Males determined the positive QL evaluation of Group I teachers, particularly in social relationships. On the other hand, females determined predominantly a more negative QL evaluation by Groups III and IV, particularly in the environment domain.

Data on gender corroborate those in the literature^{16,23}, underscoring that females tend to have a more negative QL perception. Such results may be explained because normally females have a greater work load due to family care and house tasks, which may jeopardize QL, besides schooling demands²³ (planning of lessons, preparing activities and evaluations, pedagogical meetings, class reports). These factors may have contributed towards results in current study where most females belong to Groups III and IV, or rather, medium and more negative QL perception when compared to others, especially in the environmental domain.

Vital cycles proved to be varied in QL profile of teachers from the four groups. From such a point of view, Group I, teachers with the highest QL scores (more positive profile), especially within the social relationship domain, comprised homogeneously teachers of the up to 49-year-old bracket. On the other hand, Group IV,

teachers with the lowest QL evaluation, especially within the psychological domain, comprised predominantly teachers within the 30 and 49-year-old bracket, few teachers up to 29 years old (younger) and above 50 years old (older).

Since mean adult age lies between 30 and 45 years, the stage is marked by the desire to reach the top of physical and mental performance, with great courage and energy¹⁴. Professional life is marked by promotions where teachers seek greater competences for the development of their tasks²⁷. Such an insight into the characteristics that make up the vital cycle reveals that personal and professional factors may contribute towards a more negative perception, particularly by the fact that the psychological domain is the most affected one, as was perceived by the Group IV teachers.

With regard to the professional characteristics of PE teachers, QL profiles of teachers of Groups I and II (more positive evaluation of QL, especially within the social relationship domain) were determined by the start of the teaching profession (up to 3 years). Data showed that these groups are made up of teachers at the start of the teaching career within the school network and experiencing the first impacts of school conditions²⁸.

Teachers in current study may be experiencing the transition between initial teaching formation and introduction which is a time frequently marked by survival in the profession, characterized by real shocks with the school conditions, and by the discovery, characterized by enthusiasm brought about by an idealized professional milieu and by taking part in the school teaching body²⁹. Consequently, it may be inferred that Group I and II PE teachers showed they are experiencing the discovery of their profession and that they are feeling prepared to face the challenges of the school environment. In fact, they have a more positive QL perception, especially within social relationships. It must be underscored that social support sources positively affect teachers' QL⁴.

QL profile of Group III teachers (medium scores in QL perceptions and the worst evaluation for the environmental domain) was determined by activities with the schooling network up to 10 years and, mainly, with teaching as the sole source of income. The above triggers a discussion on the teaching career within the

teaching network. It may be perceived that after the first years of insertion within the teaching profession, after the initial thrill, teachers start establishing professional expectations, such as professional growth, adequate working conditions and higher salaries³⁰. Frustrations abound when such expectations are not achieved and may affect negatively their QL.

Further, the profile of Group IV teachers (the worst QL evaluation, especially within the psychological domain) is characterized by teachers with a time service ranging between 4 and 20 years. The trend towards a QL decrease by teachers throughout their profession is due to disenchantments with the teaching profession²⁴, which may prop in several ways, such as non-satisfaction with the profession, weariness, carelessness, difficulties in establishing relationships with students and other colleagues or difficulties in maintaining the necessary links for the performance of the teaching activities³⁰. Since they experienced teaching conditions and day to day school hours for a longer period, more experienced teachers within the teaching network may be experiencing a more negative QL and, consequently, a great emotional stress, as the characteristics of Group IV reveal.

The limitations of current research comprise the fact that results have been retrieved from self-administration questionnaires. Consequently, the analysis of the characteristics proper to each group were not very robust. In fact, they came from sociodemographic features. However, in spite of such limitations, the study has relevant characteristics to understand teachers' QL profiles, underscoring factors that affect the QL of PE teachers in government-run schools in the Greater Florianópolis area.

CONCLUSION

Data identified four groups of PE teachers that work in schools in the region of the Greater Florianópolis, providing a general evaluation and QL domains. Group I had a more positive general QL perception and its distinct domains, whilst Groups II and III revealed medium scores. Group IV had rates very close to negative QL perception.

There was a significant association between groups with regard to gender, with most males in Groups I and II and females predominantly in Groups III and IV. In the case of vital cycles, Group I was homogeneously composed by teachers aged up to 49 years, whereas teachers between 30 and 49 years old were predominant in Group IV.

With regard to professional characteristics, QL profiles of teachers in Groups I and II were determined by the initials years of teaching (up to 3 years). On the other hand, whereas Group II was determined by teaching activities up to 10 years, Group IV was characterized by teachers with a time service between 4 and 20 years.

Since physical domain presented medium to negative scores for the four Groups, the environment domain evidenced negative scores for the two groups and the psychological domain is perceived as that most negatively impacted by teachers of the group with the most negative QL perception, it may be recommended that municipal and state Education Secretaries should focus on:

- Teachers' working conditions, by constantly improving physical space, such as covered pitches, gymnasiums and proper classrooms, with structures that favor activities and communication (conservation of voice), minimizing student's dispersion and prolonged periods during which the teacher is exposed to climatic conditions (wind, rain, sun);
- Career to valorize the teaching profession;
- Adequate balance between periods for pedagogical preparation and periods dedicated within the classroom;
- Consulting focused on school context in which teachers would be guided on pedagogical challenges and difficulties they have to cope with, besides sharing of practices with peers.

These activities may be of great help to reduce anxiety and feeling of failure that may frequently arise among teachers and they may provide more attractive conditions for the full development of work undertaken by teachers.

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