

ICT in Basic Education: Educational experience at EEFM Prof. “Bol ívar Bordallo da Silva, Bragan a”, Par ́, Brazil.

Rezerneide Guimar ães Melo¹ Ros lia Souza de Oliveira¹

¹State Department of Education-SEDUC/PA; Federal University of Par ́ - UFPA

Abstract

The computer and internet when incorporated in to the school routine favors the development of new pedagogical circumstances [1]. Many tools provided by ICTs offer interactive web space without the need what internet users have mastery of the programming language. The Ministry of Education - MEC directs public education for the inclusion of the new methodologies in teaching and learning at all levels of academic training. In 2009, there was a public school teaching experience in Basic Education, in which the student was considered co-author in the training process based on the use of ICTs for teaching/learning of Statistics.

Keywords: Teaching; Learning; Technology; Statistics; Public Education.

1. Introduction

The involvement of academic content with the everyday actions of the students is part of the process for achieving quality basic education [2]. Society today differs by technological advances in various areas of human development, Highlighted for Information Technologies and Communications, known as ICTs, which are increasingly present in routine public schools. From the perspective of innovating the teaching and learning of Statistics,

was designed and applied a methodology that uses ICTs.

The motivation for entering new teaching methodologies comes from the curriculum observation related to income in Mathematics and the level of excitement to the study of Statistics, held among the students of 2nd grade of high school in the State School Professor. "Bol ívar Bordallo da Silva", popularly known by the acronym BBS.

The appropriation of the possibilities of using ICT in the classroom is a result of teacher access to continued education. Possible by the partnership between the Federal and State governments with higher education institutions for the provision of the specialization "Media in Education"[3].

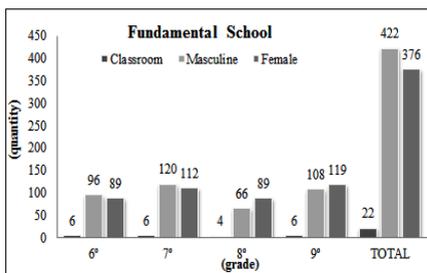
This paper presents a pedagogical practice that excels in the study of methods for applying and, in appreciation of student self-knowledge. Both associated with the local culture, human development and professional preparation. First, were worked, manual methods of a statistical study for to be introduced known softwares later (Microsoft Excel and BrOffice.org Calc), in order to foster previous understanding of the algorithms. Procedures and results of the experiment in the classroom in the school, located in the municipality of Bragan a, the state of Par ́ in order to evaluate and refine the

methodology will be emphasized in this work.

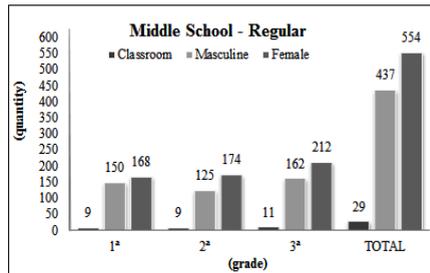
2. Characterization of the EEFM Prof. “Bolívar Bordallo da Silva”

In Brazil Basic Education regarding the elementary levels (6th to 9th grades) and High Schools (1st to 3rd grade) is a priority of States and Federal District [4]. The State of Pará has 963 schools and 82 school annexes distributed in 143 municipalities, under the coordination of the State Department of Education (SEDUC) [5].

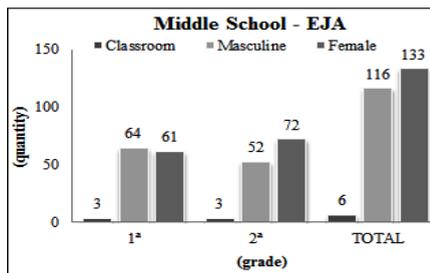
Bragança is located in northeastern Pará landmark from 1614 occupies the 10th position most populous city (113,227 inhabitants) [6], [7], [8]. The school BBS is one of 50 state schools in Bragança. Its activities started in March 1975 by resolution 87/77 with the Teaching of Grade 1st. In 1976 began offering the Teaching of Grade 2nd [9]. Currently the school runs with 57 classroom divided in three shifts (morning, afternoon and night) what offering courses in Elementary Education as from the 6th year and Middle at the teaching systems Regular and EJA - Education of Youth and Adult. The student clientele comes from all city neighborhoods and rural communities.



Pic. 1: Distribution of elementary school, 2012 school year [9].



Pic. 2: Distribution of regular high school, 2012 school year. [9]



Pic. 3: Distribution of EJA high school, 2012 school year. [9]

3. Development

If the study the Statistics made itself optional, there would certainly be few supporters in school. The probable reason may be: the technical rigors, the necessary calculations and the lack of perception of student concerning the applicability of matter in their professional and/or personal life.

In order to amend the teaching / learning of Statistics, the 2009 school year, in the BBS school, was developed and applied teaching methodology, based on three basic principles (a) the young person is also the author of its formation; (b) ICTs, part of the perceptive universe of the young, can facilitate the teaching / learning, (c) the necessity of the connection between practice and theory, and (d) the need to know the manuals procedures of statistics to comprehend software functioning.

3.1. Articulated Activity in the Classroom

Target public: 229 students enrolled in 2nd grade EM/2009 distributed into five classes: A, B, C, D and E.

Content developed: Fundamental Concepts. Plotting Data. Organization Rol. Tables of Absolute and Relative Frequency. Measures of Central Tendency (Arithmetic, Fashion & Median). Measures of Dispersion (Variance and Standard Deviation). Graphical Representation (Bar, Line, Sectors, Histogram, Polygon, pictograms and Warheads). Inductive Statistics.

Dynamic the work of the teacher: (a) Selection and review of the literature on the Statistics subject and applicability in the process of human development; (b) Lecture on statistical data (population, sample, variables, data collection, presentation of results, etc.); (c) Construction of a questionnaire to obtain the profile of students in each classroom (minimum of 12 variables and 30 respondents). Example: gender, age, height, weight, hobby, sport, professional intentions, cinema, mannequin, skin color, blood type, number of siblings, etc.; (d) Introduction of media types and technologies; (e) Construction of the blog using Blogger technology for posting exemplary of the research developed in each class, with the objective of further interaction and resolution of pre-defined questions (f) Continuous evaluation with emphasis on student performance and interest.

Internal Logistics: (a) Inform the pedagogical coordinator on the proposed work; (b) Documenting the day to day activities in the Daily of Class; (c) Validate the activities of each student with issuing stamp. (d) Maintaining order to do not disturb the Classes of teacher of the classroom beside his/her own classroom; (e) Meet and respect the time of each lesson; (f) Coordinate the scheduling of classes in Computer Lab; (g) Introduction of free

software and particular to the study of Statistics and (h) Providing passes for students returning to school in moments extra classes.

Execution schedule: Statistics Course was conducted in nine moments, previously adjusted and made available online for the student organization and extra workshop with software.

(1st) Theoretical lesson. Theme: Elements of a survey statistic. Time: 90 min.. Setting: Classroom.

(2nd) Practice. Theme: Data Collection. Time: 90 min.. Setting: Classroom.

(3rd) Theoretical lesson and practice. Theme: Plotting data - Organization of the list and classification of variables. Time: 90 min. Setting: Classroom.

(4th) Theoretical lesson and practice. Theme: Tables (frequencies absolute and relative) of each variable. Time: 90 min. (Classroom) and extracurricular (student's home, library etc.).

(5th) Theoretical lesson and practice. Theme: Graphical representation appropriate for each variable. Time: 90 min. (Classroom) and extracurricular.

(6th) Theoretical lesson and practice. Theme: Measures of Central Tendency: Arithmetic Mean, Median and Fashion of each variable. Time: 90 min. (Classroom) and extracurricular.

(7th) Theoretical lesson and practice. Theme: Measures of Dispersion: Standard Deviation and Variance. Time: 90 min. (Classroom) and extracurricular.

(8th) Pedagogical support. Teacher activity: (a) evaluation and posting of copies of each classroom in the blog and (b) developing questions for interaction forum. Time: 90 min + extracurricular. Setting: Classroom and Lab Computing.

(9th) Inductive Statistics (inferences and conclusions). Time: 9 to 12 days. Setting: Computer Lab, student residence and cyber.

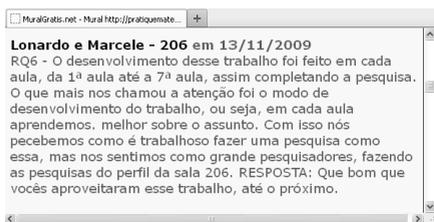
3.2. Supplies Needed

For practical lesson: (a) For each duo of students - 01 sheet size A4 and 05 sheets of graph paper, pencil, eraser, color pencil, ballpoint pen, ruler of 30 cm, compass, protractor and cellular phone and (b) for teachers - whiteboard, marker, ruler of 50 cm, eraser, drawing instruments, computer and image projector.

For online lesson: (a) Student's: Availability of Internet access, and (b) Teacher: Computer, Internet service provider, statistical software, free technologies for creating blog and message board.

3.3. Results

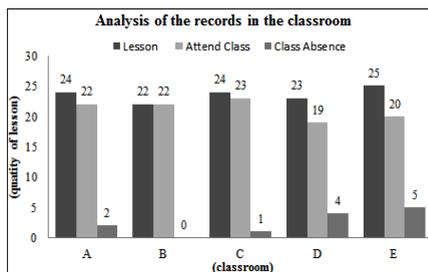
Accomplished plotting and data presentation, the teacher task was to elect, in each class, a work to be published on the blog, created especially for the group discussion.



Pic. 4: Cut the message board (forum) with the D (206) class [10].

3.3.1 Positive Points

(a) *The students stayed in the Classroom.* The sequence of practical activities involving truthful data collected in the room itself encouraged the student to stay concentrated greater time in class.



Pic. 5: Comparison between lessons given and fashions of presences and absences among students during the course in 2009 [11].

(b) *Control Everyday at the Learning.* While performing the activities by the students, the teacher is free to circulate into the room and check learning, ask questions and to authenticate the participation.

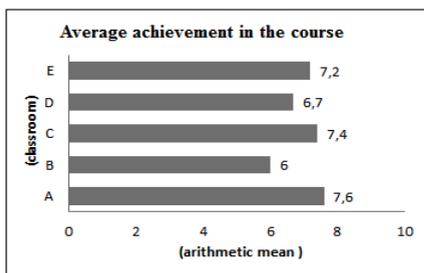
(c) *Interactions at message board (Forum).* The comments on the blog raise the student exposure, which induces him to be careful with grammar and think about what write. The simplicity of interface allows interacting with the product of their work and/or their classmates, participating in the process of their formation actively. During the discussions, there were over 390 participations in the message boards, averaging 1.7 participations per student.

(d) *Minimum Costs.* The online tools are free. The school has a Computer Lab with Internet access and most students have modern cellular telephone.

(e) *Accomplishment of programmatic content.* In the traditional mode, the period established is insufficient to meet Statistics program. This methodology introduces a better relationship with time, achieving every predetermined content. The constant cooperation between the classmates and the changing of training environment leave the classroom relaxed, facilitating the learning.

(f) *Manual Labor.* Students, in pairs, produce manual materials before take software help, a fact that leads them to understand the techniques in the presentation of data and related algorithms.

(g) *Best profit.* Overall it was best the average the profit.



Pic. 6: Profile in Mathematics 2nd Series middle School during the course [11].

3.3.2 Difficulties

(a) *Student resistance.* Teacher needs patience and persistence a lot to gain the confidence of students that are habituated to attend traditional classes. This is done to the extent that the activity is being performed.

(b) *Thermic Discomfort in the Classroom.* The classrooms do not have air conditioners, Amazon climate (hot and humid) increases the fatigue during practical activities.

(c) *Need more Projection of images Equipments.* During the activity, there were only 02 image projectors in the school to supply the daily requirement of 20 teachers, which increased the time of lectures.

(d) *Internet Speed.* Slow internet cause problems to send data (raising the time to do the posts) and to provide interactions in forums, mainly when there are many accesses.

(e) *Labour Time of the Teacher.* Deficiency of timetable system of teachers, that estipulate an insufficient time to the work of research, posts and interactions on-line at school, rises the work hours of teacher at home.

4. Conclusion

Classes are more interesting when students become authors of their own learning. In this case, teacher assumes the role of a facilitator that helps the students to discover what the object of the study that is more pleasant for them, to emit opinion about the classes dynamic, to manage their time to realize the activities into a previous chronogram and to progress in their learning through the knowledge of information networks and in the access of the hypertexts that permit a quick and efficient research. This group of attitudes contributes expressively to the students understand techniques and calculus of Statistics. It is important to protrude that, despite the activities are tiring, the constant integration among teacher and students becomes easier the scholastic environment and to conduct to the learning more meaningful. In this way of attendance classes can be observed among students: (a) team spirit; (b) organization of the work; (c) preoccupation about the chronogram; (d) discussion about subjects into the pairs and groups of students; (e) interest about subject; (f) comprehension that Statistics is important to their academic and professional formation.

5. References

- [1] Cenpec. "Internet na Escola. Caderno do Capacitor". *EducaRede, São Paulo*. pp. 8-12, 2007.
- [2] Caruso, F. "Educação, Ciência e Desenvolvimento". *Cotia, SP: Casa Editorial Maluhy & Co*, pp. 23-42, 2012.
- [3] <http://portal.mec.gov.br>
- [4] <http://www.imprensaoficial.com.br/PortalIO/>
- [5] http://www.seduc.pa.gov.br/portal/escola/consulta_matricula/RelatorioMatriculas.php

- [6] http://www.estadosecidades.com/braganca-pa_cidade.aspx
- [7] <http://www.ibge.gov.br/cidadesat>
- [8] <http://www.skyscrapercity.com/showthread.php?t=380141>
- [9] Projeto Político Pedagógico. *Coordenação Pedagógica (org.). Bragança-PA. BBS: 2012.*
- [10] <http://rezerneide-pratiquematematica.blogspot.com>
- [11] Secretaria Escolar. “Registro Escolar: Caderneta de Matemática 2ª Série do 3º Bimestre/2009” *Coordenação Pedagógica (org.). Bragança-Pará BBS: 2009.*