CONSTRUCTION OF PRINTED MATERIALS FOR EDUCATIONAL DISTANCE LEARNING DEGREE IN MATHEMATICS: THE CASE OF UFPB[1]

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ABSTRACT

This work has as main objective to analyze as it did the first construction of printed educational materials (PEM) for the Degree in Mathematics at a distance from the Universidade Federal da Paraíba. For this, we come to five teachers who prepared the first printed teaching materials and course coordinator. The methodology was qualitative, descriptive and analytically in a simple case study, analysis using standard data processing. The data collection instrument was a structured interview, conducted individually, in the period from June to August 2009. The results indicated that the main difficulties of teachers in the production of instructional materials were related to students' unfamiliarity with the profile of the course and no previous experience in the production of teaching materials for higher education.

Keywords: Distance education; Printed material; Teaching Math, Higher Education.

1-INTRODUCTION

The social, economic and cultural changes that are happening in this century are also driving change in education, forcing a redefinition of roles. Getting information is no longer an impediment of current education, as in ancient times, when it was owned by a privileged minority. Today, we are

concerned on how to provide access to this population without deleting it and at the same time, learn to teach, evaluate, interpret, classify and use the knowledge (Tedesco, 2004). [8]

One of the current concerns of public management refers to the training staff who serves on the basic educational levels, to ensure access to higher education of these professionals. This concern is based on the problem of scarcity of specialist teachers in Basic Education. On the other hand, there is still a great longing of young people to public higher education, free and with quality. Both motivations are the focus of the mode of Distance Education (hereafter DE).

2 - THEORETICAL BACKGROUND

Distance education is a mode of teaching which has as distinctive feature the fact that the learner, usually found in geographically distinct place in relation to the teacher. In Brazil, we find traces of this mode from the beginning of the twentieth century which have been brought to our country by a representative of North American international schools, in order to conduct distance training.

In 1939, the Rádio Técnico Monitor institute has established itself as a pioneer in this mode of teaching in our country. The institute offered professionalizing course by post.

In 1941 he was created in Brazil the Instituto Universal Brasileiro (IUB), with the same philosophy of the Monitor Institute. The two methods were almost the same: professional initiation in technical areas without requiring any previous schooling, although in the first, the courses were the most sought supplemental and second, the technical courses.

We can mention as example of the use of this model in Brazil, the texts written in the guides of the students in the 1960s and 1970s, the Instituto Universal Brasileiro. The following illustration shows a printed teaching materials to clarify the main questions of distance education at the time.

It was not possible to specify the exact date of production, or identify the authors of this guide, by the fact that this information not included in the original material. Thus, we can take as reference the date of receipt of the material by mail, August 20, 1969, handwritten by a student of the course, which can be
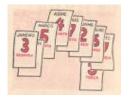
seen in the upper right of Figure 1.

Figure 1: Study Guide of the Instituto Universal Brasileiro - 1960 to 1970.

In the guide, presented here, was the outstanding facilities offered to students to take a distance course was enough to read and write. These institutes were not asking any previous document to perform the registration of students, requiring only the completion of a form through which to identify if the student could read and write (PALHARES, 2006)[7] .

The contents of the texts produced for this season, also called "lessons", were designed with the purpose of transmitting information, without there being any care to characterize it as made for a student who was separated from his teacher geographically or temporally, without distinguish it from in person teaching. The guide point in the answers to many common questions a beginner:

When should I start studying? At any time. we do not have holidays and any day or month of the year may subscribe to our Institute (GUIDE, 1969, without page number). [5]

Figure 2. Start of study

Figure 3. Lessons

When will I receive the lessons? The first lessons will soon follow after we have received your completed registration and payment, as we give instructions attached. The following lessons will be dispatched fortnightly. However, if you have urgency in completing the course, we will assist you, agreeing to any your suggestion for faster completion of studies. (GUIDE, 1969, without page number). [5]

Figure 4. Books

I need to buy books? No, because our lessons are complete. In the program of each course includes all lessons, exercises, practical work, in short, all the study material that students need. (GUIDE, 1969, without page number) [5] .

Figure 5. Time to study.

Can I study featuring a short time? Without doubt, it does not require the study of certain lessons in a fixed term, as happens in schools where frequency is mandatory. You will study quietly, according to the time available to it, without interrupting their daily occupations or work, devoting himself to his studies only in his spare time. (GUIDE, 1969, without page number). [5]

Figure 6. Too late to study

Not too late to study? Absolutely. The remarkable development of the modern world requires an increasing number of elements actually prepared. Therefore, whatever your age, the study will only be useful and beneficial. To study there is no age limit. (GUIDE, 1969, without page number). [5]

Frequently asked questions were clarified for future students, providing the main concerns of students to start a distance learning course. The text of the guide ends with a sentence that was, and still is the major attraction of the modality of distance education: "Our students study in their homes comfortably, no needs to make long journeys, always expensive and tiresome." (GUIDE, 1969, without page number). [5]

2.1- Printed Course Material is Still Widely Used?

Today, the age of technology, the printed material in distance education remains a fundamental means for presentation of learning content. According points Aretio (2006)[2], three fourths of the total time of the work of students in distance learning courses at the National University of Distance Education of Spain (UNED) were devoted to the reading of written material that, in the late 1980s and until the today, remains a basic component of the courses.

Thus, we may ask: *Who should be the target of DE?* According (2006)[2], students of distance education should be adults, self-motivated and driven to success. Thus, we believe that the author refers to students fully aware of their responsibilities and functions within an environment of teaching / learning. This author also states that, as hoped for committed students in distance learning, teachers are also expected with these attributes. He defines a good teacher at work who knows how to motivate, to effectively deal with information, answer questions, maintaining an ongoing dialogue with their students, guiding them, establishing recommendations consistent with the proposed work, monitoring and evaluating their (ARETIO, 2006)[2].

Given these quality requirements, how to produce printed educational materials for distance learning courses which meet the specificities considered?

2.2 – Producing PEM for Distance Learning Courses

In presential teaching, the teacher prepares his lesson and, during his presentation, makes the necessary adjustments if necessary. In distance learning, these adjustments will have to be provided with careful design and development of a technology base that can predict future difficulties of the students, since the interaction does not occur immediately. To produce this type of educational material, aimed at a distance cource, Aretio (2004; 2006)[1] [2], indicates some categories of quality that enable mitigate or terminate future difficulties arising from exposure of the content. These features are organized into sixteen classes: *programming; adequacy, accuracy and timeliness, integrality, integration, openness and flexibility, coherence, effectiveness, transference and convenience, interactivity, significance, validity and reliability, representativeness, self-evaluation, efficiency and standardization.*

Considering the sixteen quality requirements suggested by Aretio (2006)[2] for the preparation of printed teaching materials for distance education, we found that all, except the efficiency (cost and time), can compose, without distinction, both materials to be used in an presential course, as the distance one.

Develop printed instructional materials to distance learning does not follow a homogeneous model in all educational institutions that adopt this type of mediation as a possibility of knowledge. By contrast, materials are generally quite different in their planning proposals, requirement, content and objectives. According Aretio (2006)[2], the materials that actually intend to teach knowledge accumulated by mankind over time, tied to clearly defined content and teaching strategies, constitute the "backbone" of any proposed distance education, being crucial to ensure much the success of the course.

The models adopted in higher education institutions to produce printed materials are diverse. From one extreme to another, there are cases of printed educational materials (PEM) produced by a single author, who works without any knowledge of the methodology of distance education, and cases of materials produced by a multidisciplinary team composed of experts from various fields of knowledge (FARIAS; RÊGO, 2009)[3].

3- METHODOLOGICAL PROCEDURES

This research has a descriptive and analytical, depending on their intended study. The method used was a simple case study, with only one interaction of data (YIN, 2005)[9]. The data processing was qualitative using content analysis to infer the speeches of research subjects and compare them with the standard, as referenced theoretical basis.

Were interviewed, individually, the five teachers authors of UFPB Virtual in addition to the Course Coordinator. The data collection instrument used was an interview, guided by a structured script. The average duration of each interview was twenty minutes. Some of the results is presented below. To preserve the research subjects, participants were not identified by name, was

only assigned the letters A, B, C, D, E and F for teachers, authors and the Course Coordinator.

4- RESULTS

When designing a material is interesting and desirable to know the profile of people who will use the production. In PEM, the students' profile determines the majority of the procedures that will be given on the course of prior knowledge to which the proposal is presented. In an ideal perspective, most of the procedures to be adopted in developing the PEM for a course, should take into account the prior knowledge of users for which such a proposal is presented in order to minimize the difficulties in producing these materials (ARETIO, 2006)[2].

When questioning the teachers about whether authors were difficulties in the construction of PEM, we obtained the following responses:

> Uma vez que já tínhamos definidos as estruturas ou os nomes das seções, tipo "construindo o conhecimento", "situando a temática", "problematizando" ... uma vez que esses tópicos já tinham esses nomes definidos, esse padrão, a dificuldade era de como o material (a parte teórica), encaixar nessa proposta, por exemplo: como é que eu vou problematizar a unidade um, toda a unidade um e inserir nesse tópico problematizando a temática? A dificuldade que tinha era mais essa: era reunir o material e dar ... e adequá-los a esses tópicos (TEACHER A).

> Não, dificuldade minha não, o problema é que eu não era acostumado com esses assuntos, pois se tratava de um assunto que eu nunca tinha ensinado fazia décadas que eu não via. Mas não tive dificuldade, peguei alguns livros estudei e saiu com certa facilidade (TEACHER B).

> Sim. De início a gente teve certa dificuldade de saber o que colocar nesse material. Já que a ementa era um pouco flexível, então a gente tinha limitações de conteúdo, que também não podia colocar muita coisa. [...] tinha uma outra que se tratava de ser a primeira vez que eu estava elaborando um material deste porte [...], tinha a limitação do tempo, cerca de um semestre para ser dado numa disciplina de sessenta horas. Tinha também uma limitação de tempo e... limitação de quantidade de páginas (TEACHER C).

> Não. Acho que a pessoa pode ter dificuldade na elaboração de materiais impresso, basicamente, a partir de três origens: por falta de um conhecimento adequado do conteúdo; por falta de

> uma sensibilidade de perceber que aquilo que está sendo escrito deve ser compreendido e acha que o que está se falando e o que está escrito, são plenamente entendidos, e às vezes, não está e o terceiro é ter aptidão para escrever [...] se estes três elementos são combinados você elabora qualquer material sem grandes dificuldades (TEACHER D).

> Não tive dificuldade ao elaborar o material em si, mas pensei muito como iria produzir um texto voltado para uma disciplina teórica para um curso de Matemática a Distância (TEACHER E).

As we can see, some teachers proved to be unsafe with respect to the first production of printed educational materials for mathematics courses. In presential courses such material is generally thought by most mathematics teachers of higher education institutions as being "good" when they bring less explanations, examples and clarifications, being under the student's responsibility to go after what was in "leading" of the written text. In some well respected books, it's common phrases like "it's easy to see," referring to the question that often does not seem to have no meaning for the student. Students feel unsafe and often resort to other students to remove their doubts or to other teachers. This type of text is not interesting for a student of distance learning because, according Aretio (2006) [2], Filatro (2008) [4] e Moore (2008) [6], the PEM must be the most self-explanatory as possible, able to provide clear and appropriate language to a student who finds himself alone, far away, geographically and temporally. PEM, whatever it is, has to meet most needs of the students, anticipating questions, clarifying ideas and concepts, with several different solutions, solved exercises, having a clear language, short and precise, with several activities that contribute to better understanding of what is presented.

The course coordinator reported that many teachers felt that difficulties and these difficulties were increased according to the progress of the course, as we see below:

> No primeiro volume, nem tanto. Como no primeiro volume só participarem cinco professores que já conversavam há bastante tempo, fez com que não surgissem muitas dificuldades. O problema foi aumentando quando o leque de disciplinas aumentou e dentre os professores que vieram, alguns não

> tinham incorporado ainda a filosofia e metodologia da EaD. Então deu certo trabalho [...], o material era produzido e quando íamos verificar dávamos sugestões de mudança de linguagem, de melhor adequação com o "espírito da EaD", colocar de exemplos ligados ao dia-a-dia do aluno [..] então a coordenação fez e ainda faz essas observações com todos os materiais produzidos pelos professores (TEACHER F).

We noticed in the report of the teacher F that the most obvious difficulties of the teachers to produce PEM concern, not the mathematical content, but the proposal of DE. The construction of an explanatory material, containing guidelines on how to study, how to seek supplementary texts, as simple as possible, it is a challenge that the team has every semester course.

5- FINAL CONSIDERATIONS

The main difficulties encountered by teachers authors focused on a challenge of preparing materials for distance learning without any previous reference. Despite the technical preparation of each one of them, lack of experience with this type of education has made the process of development of printed educational material, the main learning resource used by students in this type of education, an intuitive activity and without prior evaluation of the quality of PEM. This signals the need for ongoing training of higher education professional, especially aimed at adapting to new forms proposals for teaching.

At the end of this research it was found by teachers interviewed, a necessity of re-evaluation of the course and the didactic production already developed. This proposal was suggested by teachers and advocated the theory as being a positive aspect, necessary for the construction of good teaching materials.

Note:
[1] Article on the Dissertation directed by Professor Dr. Gaudencio Rogéria do Rego in the Postgraduate Program of Universidade Federal da Paraíba, PPGE/UFPB, in 2009.

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