8

Artigo

A study about dropouts in the physics course of the State University of Maringá: traditional teaching modality *versus* distance teaching modality

ABSTRACT

Research has revealed that dropouts of the Licenciate Physics course at Public Universities is very high. Current essay analyzes dropouts from the Physics course of the State University of Maringá, in presence-based and distance modalities. Data from the annual reports of the State University of Maringá and from data made available by the Directory for Academic Issues of the same Institution were retrieved. Besides that, twenty students hailing from the traditional Physics course and twenty from the Distance Education Physics course were interviewed to analyze what they thought about course dropout rate and whether they were thinking of leaving the Physics graduation course. The answers gave possible motives that made students quit the Physics Course of the State University of Maringá. The qualitative research comprised semi-structured interviews as an instrument of data collection and Discourse Analysis techniques for data analysis. Data showed that quittance from the Physics course at the State University of Maringá are a great concern. Students' interviews showed that the main motive that makes student quit are difficulties with the subject matters and with the lack of knowledge on the fundamentals of Mathematics, required for the understanding of course's contents.

Keywords: Dropouts; Distance Physics course; presence-based Physics course.

RESUMEN

Muchas investigaciones señalan que la evasión en los cursos de Licenciatura en Física en las Instituciones de Educación Superior brasileñas es grande. El presente artículo tiene como objetivo hacer un estudio sobre la evasión en el curso de Física de la Universidad Estatal de Maringá (Estado de Paraná), en las modalidades a distancia y presencial. Para eso, se analizaron datos sobre el curso de Física, obtenidos en los informes anuales de la Universidad Estatal de Maringá (UEM), llamados Base de Datos, y datos disponibles en la Dirección de Asuntos académicos (DAA) de dicha institución de Educación Superior, campus Maringá. Asimismo, se entrevistaron veinte alumnos de la modalidad presencial y veinte alumnos de la modalidad a distancia,

con el objetivo de conocer lo que ellos piensan sobre la evasión y si ellos ya pensaron en abandonar el curso. Basándose en las respuestas, se presentan posibles motivos que llevan a los alumnos a evadir el curso de Física de la UEM. La investigación fue de tipo cualitativa y se utilizaron las entrevistas semi-estructuradas como instrumento en la colecta de datos y para el análisis de los datos se usó la técnica de Análisis de Discurso. Los datos muestran que la evasión en el curso de Física de la UEM también es preocupante. Sobre los relatos de los alumnos se concluye que el principal motivo que hace que los alumnos abandonen el curso de Física es la dificultad con las asignaturas del curso y la falta de conocimientos de Matemática Básica, necesarios para la comprensión de los contenidos abordados en el curso.

Palabras clave: Evasión, curso de física a distancia, curso de física presencial.

RESUMO

Muitas pesquisas apontam que a evasão nos cursos de Licenciatura em Física nas Instituições de Ensino Superior brasileiras é grande. O presente artigo tem como objetivo fazer um estudo sobre a evasão no curso de Física da Universidade Estadual de Maringá, nas modalidades a distância e presencial. Para isso, foram analisados dados sobre o curso de Física, obtidos nos relatórios anuais da Universidade Estadual de Maringá (UEM), chamados Base de Dados, e dados disponibilizados na Diretoria de Assuntos acadêmicos (DAA) dessa instituição de Ensino Superior, campus Maringá. Além disso, foram entrevistados vinte alunos da modalidade presencial e vinte alunos da modalidade a distância, com o objetivo de conhecer o que eles pensam sobre a evasão e se eles já pensaram em abandonar o curso. Com base nas respostas, apresentam-se possíveis motivos que levam os alunos a evadirem do curso de Física da UEM. A pesquisa se deu de forma qualitativa e foram adotadas como instrumento na coleta de dados entrevistas semi-estruturada e para a análise dos dados usou-se técnicas de Análise do Discurso. Os dados mostram que evasão no curso de Física da UEM também é preocupante. Sobre os depoimentos dos alunos conclui-se que o principal motivo que faz com que os alunos abandonem o curso de Física é a dificuldade com as disciplinas do curso e a falta de conhecimentos de Matemática Básica, necessários para compreensão dos conteúdos abordados no curso.

Palavras-chave: Evasão, curso de física a distância, curso de física presencial.

INTRODUCTION

It is known that there is a lack of physics teachers in the Public School System (INEP, 2003) and a overwhelming issue in relation to this problem is that dropouts[1] in licentiate degree courses in Physics in Higher Education Institutions in Brazil also is grand. Thus, many researchers in physics teaching have been concerned with such matter[2]. Below, we highlight some recent approaches that mention dropout in the licentiate degree courses in Physics in classroom modality.

[1] It is understood by dropout when a student quits definitely any stage of the course, either by neglect or request.
[2] ARRUDA; UENO, 2003; PINTO; MASSUNAGA, 2005; PEREIRA; LIMA, 2007; GOMES; MOURA, 2008; JOELE; CASTRO; BRITO, 2011; SILVA ET AL, 2011.

Barroso and Falcão (2004, p. 1) state that in the Physics course of the Federal University of Rio de Janeiro, from the 120 students Who enrolled in the course per year, approximately 10% finish some other course. The same happens to the Physics course from Campus Catalão of the Federal University of Goiás. Silva *et al.* (2011, p. 1-2) has declared that from the 50 students Who have enrolled in the course in 2006, only Five graduated in 2010, and, that from the 45 other students, approximately 18% might have finish the course on the next semesters.

The situation is no different at the State University of Londrina, Parana. A survey conducted in 2003 by Arruda and Ueno (2003, p. 161) showed that, in the last ten years of the Physics course, from the 436 students enrolled in the bachelor course, only 61 graduated, that is, approximately 14% of students completed the course. To the licentiate degree the situation is even worse because from the 319 enrolled, only 22 completed the course, 5,9%.

A study performed at the Federal University of Maranhão showed that the problem of Physics course dropouts at the institution is old. According to Pereira and Lima (2007, p. 3), a professor at the University conducted a study on dropout rates in 1978 and found that in the Physics course, dropout was 70%. The PET-Physics Group at the University of Brasilia (UNB) also conducted a study on dropout rates in the of graduation in Physics course at UNB and found that dropout rates between 60% and 80% are common in the Physics course of the Institution (RIBEIRO *et al.*, 2008, p. 5-7).

Dropout has also worried Physics courses at distance modality. Studies indicate that this is a problem that has reached not only the Physics courses, but other courses also[3]. Although Silva and Marques state that in distance Physics course (2012, p. 1) *"there are few studies that investigate the root causes of this phenomenon in the courses in the distance modality"*, according to the authors, *"dropouts in distance courses is likely to be even greater than in classroom courses"*.

Although there are few studies about the dropout in the distance physics courses, research shows that in the courses of this type generally dropout rate is significant, and there are many factors that contribute to it. In this regard, we highlight the work of Comarella (2009), who investigated students and tutors in order to know the factors of dropout in courses offered by the UAB / UFSC. The author found the factor most cited is the lack of time to devote to the course, mentioned by 68,93% of the students and 26,72% of the tutors. It was also mentioned by respondents as dropout factor the belief that distance education courses require less efforts, difficulties in participating in activities at the learning centre and difficulties with the resources used in the course, among others.

Bruno-Faria and Franco (2011) analyzed the dropouts and its causes in a licentiate course offered for the distance students of the Federal District and the northern region. The survey results showed 36,23% of dropout students have considered the academic performance as the main cause for quitting the course.

[3] MAIA; MEIRELLES; PELA, 2004; COMARELLA, 2009; BRUNO-FARIA; FRANCO, 2011; ALVES; SALES, 2012; MARTINS ET AL, 20313; MOREIRA ET AL, 2013.

The work of Alves and Sales (2012) also examined the causes of dropout in a distance course in Itapemirim - ES for four years. The survey revealed that the main factors that cause dropouts are: lack of time, difficulties in dealing with the resources used in the course and the end of the belief that a distance learning course requires less effort than the classroom learning.

The work of Maia, Meirelles and Pela (2004) showed that there is a relation between the dropout rate in higher education distance courses and the technology used in distance learning courses in higher education institutions. The authors analyzed 37 institutions in Brazil and emphasized that

> courses entirely at a distance interactions between students and teachers are held through technological means, without any physical meeting. [...] which can cause to the students feeling of isolation from the group, discouraging students to continue the course. In contrast, those who participate in physical meetings are motivated to learn, interact, because they feel included in a group.

In other words, by means of such data, it could be verified that dropouts, not only in Physics courses, are a problem that happens all over Brazil. In addition to these alarming numbers, many works have also shown the causes of dropout in Physics courses (BARROSO, FALCÃO, 2004; ARRUDA; UENO, 2003; PEREIRA; LIMA, 2007 CAMPOS, 2010; GOMES; MOURA, 2008; JOELE; CASTRO; BRITO, 2011), and have some suggested to try to reverse this dismal picture (BARROSO, FALCÃO, 2004, RIBEIRO et al., 2008).

As a cause of dropouts, it is found many arguments in the literature. According to Barroso and Falcão (2004), dropouts of courses in general, especially those of low demand, such as Physics, occurs in the first two years of the college course. The authors explain this, stating that dropouts occur due to "deficiencies of high school and the improper selection of admittance exam" (BARROSO; FALCÃO, 2004, p. 2) and, consequently, the "failure in the early disciplines (Physics 1 and calculation 1) (BARROSO; FALCÃO, 2004, p. 11).

Arruda and Ueno (2003, p. 173) conducted a survey with Phisics students from a traditional presence-based course at the State University of Londrina, in attempting to understand the motivations and interests of students to enroll in the course and factors that discourage them during the course, that may influence students to drop the course out. On aspects that have negative impacts on the retention of students, the authors point out:

- Usually, there is an excess of tasks to be accomplished, which causes accumulation of activities and lack of time to fulfill them efficiently.
- From the point of view of relationships, the senior students of the course, sometimes transmit their fears and frustrations for freshmen, especially their (bad) impressions about certain teachers. In fact, sometimes they can put pressure on the students, making them feel insecure, inhibited, depending on the way they are treated.
- A bad relationship with a teacher can be highly discouraging factor for the continuity of the student in the course.

- The opinions of important and significant people in the student's life, as parents, former teachers, can encourage and discourage student participation in the course (ARRUDA; UENO, 2003, p 173).

A research made by Pereira e Lima (2007) on the reasons that lead students drop out of the Physics presence-based course from Federal University of Maranhão, it is not much different from the conclusion that Arruda and Ueno (2003) reached. The authors point out that among the reasons for dropout, stand out "(1) difficulties in combining work and study; (2) frustration of expectations with the Course; (3) requirement of exclusive dedication to the course is incompatible with professional, family and personal needs; and (4) disappointment with the University" (PEREIRA; LIMA, 2007, p. 4).

About the reasons that led students to drop out the distance licentiate degree in Physics from Federal University of Itajubá, Silva and Marques (2012) pointed out in their study that the main factor that made students dropping out was the difficulty in conciliate work and study.

Some authors also seek possible solutions to this high dropout rate in Brazilian universities, such as the work reported by Barroso and Falcão (2004) at the Federal University of Rio de Janeiro. It was used a methodology for the subject entitled Physics I at a presence-based course, with the aim of trying to reduce the high dropout rate of students in the first year of the course. According to the authors, the difficulties presented by students in the early grades were classified into three groups:

> associated with difficulties in understanding the specific language of science, the problems of understanding the existence of a scientific method, and the inadequacy of habits and study methods. This diagnosis allowed that the discipline could be taught with features that spell out and allow to overcome these deficiencies: concepts of Physics of each subject were presented in demonstration lessons (with extensive use of videos, experiments and simulations), the theoretical and laboratory activities were integrated informally, the operationalization of concepts began to be made to privilege mechanisms using active and cooperative work of students, and educational materials in various formats for specific covered content was developed (BARROSO; FALCÃO, 2004, p. 2).

Through this methodology, the first student evaluations showed good results and the authors concluded that "dropouts of University Physics courses can be reduced with a teacher's work related to addressing of content specific aspects [...] and the other connected to issues related to an appropriate career choice of the students who have enrolled in this course" (BARROSO; FALCÃO, 2004, p. 13).

Therefore, this article aims to make a study about dropouts of the Physics course from State University of Maringá, in the distance and traditional presence-based modalities in order to check which modality the dropout rates are more serious, to know what students think about dropouts and if they ever thought about quitting the course. From this, it is intended to look for possible

reasons that lead students to drop out of the Physics course from UEM.

1. THE RESEARCH

The research was conducted at the State University of Maringa, Maringa campus, Exact Sciences Centre, Department of Physics, in the Physics course from the presence-based and distance modalities.

It was analyzed data obtained from the annual reports[4] of the State University of Maringa, called Database, data available on the DAA-UEM (Directorate of Academic Affairs) and data from NEAD-UEM (Center for Distance Education) about the Physics course from the University were analyzed of both modalities[5]. Twenty students of physics of the presence-based modality and twenty students of distance education were also interviewed in order to know what they think about the dropouts and if they ever thought about quitting the course.

Before starting data collection, the research project was sent to the University Standing Committee on Ethics in Human Research (Copep) for evaluation, since the research involved interviews. Shortly after the approval of the research project by Copep, students enrolled in the distance course were contacted by the tutors and by Moodle. The research was presented to students in the presence-based course in the classroom and they were invited to voluntarily participate in the research. From there, we started collecting data through semi-structured interviews.

Twenty students from distance education course were interviewed, ten enrolled in the first year and ten enrolled in the third year, at the time of interview were interviewed. Twenty students of the classroom course were also interviewed and, likewise, ten were enrolled in the first year and ten were enrolled in the third year.

The audio of the interviews was recorded and later transcribed. After the end of the transcripts, the data analysis began. The first step in the analysis of the data was to make the categorization of the answers. The categories were found based on the ideas that were repeated in the answers of respondents, after finding these repeated ideas, we inferred an expression that represented and these expressions were exposed in the tables in the following sections.

The research is a qualitative study and it adopted as a tool, in the investigative process, semi-structured interviews, as already mentioned. The analysis and discussion of the results were made with the techniques of discourse analysis.

According Guerra (2003, p. 221) the subject results from the interaction of multiple voices, because it is not the absolute source of the meaning, that is, the student speaks according to the environment in which he/she lives and according with what he/she hears and sees during his/her lifetime. Thus, by means of discourse analysis was intended to obtain, possible reasons that lead students to drop out the Physics course UEM.

[4] The reports provided by the University are referent to the years 2003-2010 and are available on site http://www.asp.uem.br

[5] To the presence-based modality only the course of Maringá campus was studied.

2. LICENTIATE DEGREE IN PHYSICS AT STATE UNIVERSITY OF MARINGÁ: PRESENCE-BASED MODALITY

The Licentiate Degree in Physics from the State University of Maringa was created in 1972 in accordance with Resolution No. 003/72 Council of Education and Research, October 19, and recognized in 1976 by Federal Decree No. 78.430 of 16 September 1976. In 1987, the University Council, with the assent of the Council of Teaching, Research and Extension, created the Bachelor qualification for the Physics course and in January 1988 became effective two qualifications, Licentiate Degree and a Bachelor Degree in Physics. The first two grades are common to both qualifications and only in third grade the student should opt for Licentiate Degree and / or Bachelors.

The physics course EMU is crowded at the Physics Department of the Centre for Mathematical Sciences (CCE) and is offered at night. Currently, the course is offered on-campus headquarters, which are offered two majors, and Bachelors Degree, and the city of Goioerê [6] campus, which is offered only a degree qualification.

UEM performs two admittance exams per year: one in July, winter exam, and another in January, summer exam. Nowadays, Physics course offers in each exam 19 vacancies for non-quota students and five vacancies for quota students, on the main campus, and 13 vacancies for non-quota students and three vacancies for quota students, in Goioerê campus.

The total course workload is 2.988 lesson-hours, of which part is common disciplines to both qualifications, part is for the disciplines that are specific for Licentiate Degree and part for complementary academic activities.

3. LICENTIATE DEGREE IN PHYSICS AT STATE UNIVERSITY OF MARINGÁ: DISTANCE EDUCATION MODALITY

The Bachelor's Degree in Physics at distance was implemented in UEM in 2008, its first admittance exam was held in September of the same year and the second in the year 2010. In 2008, 150 vacancies were offered, distributed across the five learning centers, in the cities of Assaí, Bela Vista do Paraíso, Goioerê, Jacarézinho and Umuarama, all in the state of Paraná. In 2010, the number of vacancies has increased to 210, distributed in six current learning centers, which includes Cidade Gaúcha – PR.

The curriculum of the Bachelor's Degree in Physics is the same in both modalities, distance and present-based, with the exception of the Introduction to Distance Education, which is offered only for distance education, which the course syllabus is "Definitions and characteristics of Distance Education modality. Guidelines for studying in the distance education. Use of virtual learning environment"[7], with a workload of 34 lesson-hours. The course in distance modality lasts a minimum of four and maximum of eight years.

[6] In 1986, the University began to expand regionally; extension was implemented in the University of Cianorte, and in 1991it was created and deployed Goioerê Regional Campus, with courses in Textile Engineering and Licentiate Degree in Science.

[7] Available at <http://www.pen.uem.br/html/pen/graduacao/cursos/fis-ead.pdf> Access on July 9th 2011.

The course is offered as part of the Open University of Brazil (UAB) and therefore it operates according to the standards of the program. Each support learning center has one or two face-to-face tutors, which duties are to help the student to adapt to Distance Education (DE), assist in administrative, teaching and encouraging the use of the resources offered through Moodle platform, attend classroom activities, encourage students and help them to make study groups, create cultural bounds, discuss problems and, in addition, make distance learning a less lonely process. Face-to-face tutor must devote to mentoring service a workload of 20 hours per week, of which 16 hours are completed in the support learning center and the remainder is allocated to virtual attendance in Moodle platform and to study, moment when tutor uses to verify the subjects that are being studied by the students and course activities in general.

The subjects offered by the Distance Physics course have the distance tutors, which have functions as acting as studies mentors, helping students in solving problems, answering questions about the content and, in addition, contribute to the work of the teacher, participating in correcting assessments. The distance tutor has contact with students through the Moodle forums; students post their comments and questions and the tutor has, dutifully, 24 hours to answer the questions posted by students. In addition, tutors can schedule chats on the learning environment with the students; the interaction is enhanced and dialogue happens instantly. The distance tutor is an expert professional with good knowledge of the content and has 20 hours per week for these functions.

The faculty which work in the distance Licentiate Degree also works on the Physics presence-based course. These teachers record lessons in studio, called video classes, and make them available on Moodle platform so students can watch individually on their computers, or group gathered at the support learning centers, or in the company's or not of the face-to-face tutor.

The web conferences take place once a week and correspond to a virtual meeting conducted via Internet through applications that enable the sharing of voice, text and video. On this day, students get together at the support learning center to attend the web conference, which they can submit questions to the teacher and receive real-time response. It is the only time that students may have their questions answered during the lesson.

In addition to the video lessons, students receive course materials of the disciplines, which is written by teachers of the course. Other teaching materials are also available at course library on Moodle.

4. DROPOUTS OF THE PHYSICS COURSE AT STATE UNIVERSITY OF MARINGÁ: PRESENCE-BASED MODALITY

The following tables present an overview on the situation of dropouts of the State University of Maringá between the year 2000 and 2010. Table 1 shows how was the search for Physics course, on the admittance exam of UEM, Maringa campus, between 2003 and 2010[8].

Table 1: Information about the admittance exam to the Physics course at UEM

Exam	Vaccancies	Applicants	Candidate / vacancy ratio
Jan/2003	30	112	3,7
May/2003	30	98	3,2
Oct/2003	30	110	3,7
Mar/2004	30	96	3,2
Jul/2005	30	108	3,6
Jan/2006	30	116	3,9
Jul/2006	30	147	4,9
Dec/2006	30	103	3,4
Jul/2007	30	147	4,9
Dec/2007	30	103	3,4
Jul/2008	30	157	5,2
Dec/2008	30	117	3,9
Jul/2009	30	111	4,7[9]
Dec/2009	30	105	4,4[10]
Jul/2010	30	121	4,0
Dec/2010	30	43	1,4

Source: http://www.asp.uem.br

By Table 1, it can be verified what was the situation of the admittance exam for the Physics course in sixteen exams performed from January 2003 to December 2010. Data show that the search for the Physics course is not so low in UEM, since the average of subscribers during the exams presented in the table was approximately 112 candidates for exam, that is, if there was vacancy for all those enrolled and if everybody concludes the course without dropping out, it would be encouraging the amount of graduated students in Physics.

[8] Data reported here only the data refer only to the years 2003 to 2010 because those were the information provided by the database of UEM.
[9] Ratio of applicants per vacancy for no non-quota students. For quota students ratio is 2.7. From the 30 vaccancies, 20% are destined for the PAS-UEM and 20% of the social quota program.
[10] Ratio of applicants per vacancy for no non-quota students. For quota students the ratio is 6.0.

Table 2, below, shows the number of students who enrolled in the Physics course at UEM, Maringa campus, the number of students who completed and the number of students that dropped out of the course, between the years 2000-2011.

Table 2: Information about sobre enrolled students, graduated e dropouts in the Physics course at UEM

Year	Vaccacies filled in the admittance exam	Applicants[11]	Graduated	Dropouts
2000	59	63	14	18
2001	59	61	17	38
2002	60	61	16	32
2003	59	65	26	37
2004	60	65	20	23
2005	59	72	23	28
2006	58	63	17	34
2007	60	72	25	33
2008	56	66	16	63
2009	54	57	23	83
2010	58	61	30	40
2011	60	67	-	-

Source: http://www.asp.uem.br and DAA.

It is verified by Table 2, that until 2007, around 50% of the vaccancies offered per year were lost because of the dropouts. Since 2008 the dropout rate has increased considerably in the Physics course at UEM, especially in 2009, in which the number of dropouts was 83 students. Another factor worth mentioning is that the number of graduates per year is much lower than the number of students who drop out of the course.

The data presented in Table 2 show that the Physics course at UEM fits into the dropout problem faced by Physics courses in Brazilian universities, which are presented in the introduction. And, according to the fifth column of the table, it appears that this situation has been worsening with each passing year.

On the other hand, if one considers the statements that in the Physics course of the Federal University of Rio de Janeiro approximately 10% of students graduate in physics course (BARROSO; FALCÃO 2004, p. 1) and that in the Physics course of Catalão campus of the Federal University of Goiás 50 students who enrolled in the course in 2006, only 5 graduated in 2010, and that the other 45 students, approximately 18% still have

[11] The ways for admission in the UEM courses can be by admittance exam, external transfer, internal transfer and new license, therefore, in the table, the number of vacancies filled in the exam does not match the number of new enrolled students.

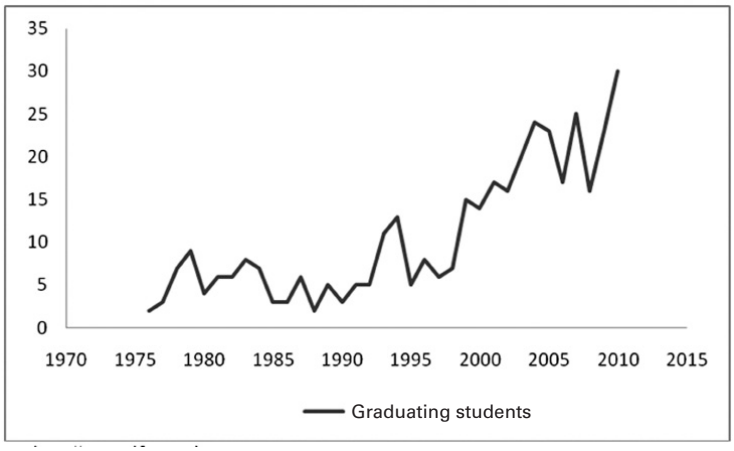
to complete the course in the next semester (SILVA et al, 2011, p 1-2.) and that, at the State University of Londrina, in the last ten years, approximately, 14% of the students completed the Physics course in Bachelors and Licentiate Degree, about 5,9% students (ARRUDA; UENO, 2003, p. 161), one can consider that UEM is forming a number of students above average because, based on table 2, it appears that, from 2000 to 2010, an average 34,4% of students have graduated per year. Not an encouraging number, and it does not solve the lack of Physics teachers in public schools, but it is observed that the number of students who graduate in Physics course at UEM is increasing over the years. This is clear in table 3, which shows the number of graduated students in Physics course since the first class in 1976 until the 2010.

Table 3: Number of graduated students per year in the Physics course at State University of Maringá

Year	Graduated	Year	Graduated
1976	2	1994	13
1977	3	1995	5
1978	7	1996	8
1979	9	1997	6
1980	4	1998	7
1981	6	1999	15
1982	6	2000	14
1983	8	2001	17
1984	7	2002	16
1985	3	2003	20
1986	3	2004	24
1987	6	2005	23
1988	2	2006	17
1989	5	2007	25
1990	3	2008	16
1991	5	2009	23
1992	5	2010	30
1993	11		

Source: http://www.dfi.uem.br and DAA.

Table 3 shows that the number of graduates was very low in the early years of the course and this situation began to reverse after 1999, when the number of graduations increased slightly. The table makes clear that the amount of students that graduates is still low, but it is growing over the years, as shown in Graphic 1.



Source: Fonte: http://www.dfi.uem.br e DAA

The next table shows what are the main reasons for dropping out of EMU Physics course.

Table 4: Information about dropouts of the Presence-Based Physics course at UEM

Year	Dropouts	Withdrawal	Canceled	Transfered	Exulted	Quit	Others
2000	18	01	01	00	02	14	00
2001	38	06	16	00	00	16	00
2002	32	10	05	01	01	14	01
2003	37	03	16	00	00	18	00
2004	23	04	07	00	01	11	00
2005	28	04	02	01	01	20	00
2006	34	05	06	01	01	21	00
2007	33	10	08	03	00	12	00
2008	63	08	28	03	04	20	00
2009	83	10	31	04	01	37	00
2010	40	09	09	02	01	10	00

Source: http://www.asp.uem.br and DAA.

Table 4 shows that much of the dropout is caused by the withdrawal of students: between 2000 and 2010, 45% of students that dropped out fit into this category. In second place, it has the deregistration, with approximately 30%, and in third place with 16%, the locking of registration.

All these data show that, despite the number of graduates has grown over the years, the dropouts is also of concern at the State University of Maringá. Physics course offers 60 vacancies per year in presence-based modality, and an average 21 students are graduating per year, that is, approximately 35% of the offered vacancies. As Table 3 shows, many students simply give up the Physics course in the presence-based modality. In the distance education modality the situation

is also similar, which will be discussed in the next item.

5. DROPOUTS OF THE PHYSICS COURSE AT STATE UNIVERSITY OF MARINGÁ: DISTANCE EDUCATION MODALITY

The following tables give some information about the Distance education Physics course at State University of Maringa, as the number of vacancies offered, number of applicants by admittance exam, number of students enrolled per year and data dropout. The distance Physics course is a new course in UEM: only two admittance exams were performed, one in 2008 and another in 2010 and in the tables the information refers to these two years.

Table 5: Information about adimittance exam to the Distance Education Physics course

Exam	Vacancies	Applicants	Candidate / vacancy ratio	Filled vacancies
2008	150	288	1,92	97
2010	210	277	1,32	160

Source: NEAD-UEM

Table 5 reveals that although the applicants ratio per vacancy is small, the number of vacancies is great because were distributed among five support learning centers[12] in the first exam and six support learning centers in the second exam. The number of applicants for college was also reasonable, the case of the first two exams. The fifth column shows that the number of vacancies filled in those first two exams was less than the number of vacancies offered, but it was a good number: in 2008, 64,7% of vacancies were filled; in 2010 that number increased to 76,2%, that is, as in presence-based course, if there was no dropout, the number of graduated students would be satisfactory. The following table provides information on the number of enrolled students and the number of dropouts in 2008 and 2010.

Table 6: Information about new enrolled students in the Distance Education Physics course

Year	Filled vacancies in the admittance exam	Applicants[13]	Dropouts
2008	97	97	55
2010	160	160	71

Source: NEAD-UEM

[12] The cities that have learning centers that offer the Physics course at UEM are Goioerê, Umuarama, Cidade Gaúcha, Bela Vista do Paraíso, Assaí and Jacarezinho.

[13] According to the NEAD (Center for Distance Education) of UEM, the forms for admission in distance learning course can by adimittance exam, diploma holders and transfer.

Table 6 reveals that the dropouts of the distance modality Physics course is worrying: in 2008, 97 students enrolled in the course and, of these, 55 droped, that is, 56,7% of students. In 2010, the number of avoidance increased to 71 students. These 71 students are part of those who entered in 2008 and 2010. The following table shows the reasons for dropout in distance modality Physics course.

Table 7: Information about dropouts of Distance Education Physics course

Year	Dropouts	Withdrawal	Canceled	Transfered	Exulted	Quit	Others
2008	55	00	00	00	00	55	00
2010	71	00	00	00	00	71	00

Source: NEAD-UEM

Table 7 shows that all the students who have left the course and have reported to the Center for Distance Education (NEAD), have done it by forfeit, with no withdrawal or cancellation of registration. Through the data presented, it appears that the situation of dropouts in the Physics course from State University of Maringa is worrisome because many vacancies are lost through the dropouts. The motive will be discussed in the next items, which will be presented through students' speeches.

6. PRESENT-BASED STUDENT' SPEECHES ABOUT THE DROPOUTS

Presence-based course students' discourse shows what they think about the dropouts and what makes withdraw in Physics course so great. Table 8 presents the categories found in the students' responses to the question: *Have you ever thought about quitting the Physics course?*

Table 8: Categories of answers from the students enrolled in the presence-based Physics course to the question: *Have you ever thought about quitting the Physics course?*

Categories	1st year	3rd year	1st and 3rd years
Yes	2	8	10
No	8	2	10

It is observed in Table 8 that most of the students thought about quitting the course. Some research shows that the highest dropout rate in the Physics course happens in the first and second year (ARRUDA; UENO, 2003 BARROSO, FALCÃO, 2004, PEREIRA and LIMA, 2007), but among the students interviewed, most who thought about quitting the course were enrolled in the third year. Perhaps one reason for this difference is due to the fact that the third-year students are longer time enrolled in the course and therefore had more time to think about quitting graduation.

Among the 10 students who answered that they have thought about quitting the course, 6 stated that the reason was the

difficulty of the course, 2 said they thought of abandoning the degree because teacher salaries are low, 1 said that the course was not what he thought and 1 said that almost quit for personal reasons. Note some speeches of students who have thought about quitting the course.

> **A10**: At first I was too discouraged, is too much difficult [...] yes, I had enough difficulties, I was quite discouraged [...]

> **A12**: [...] I was not handling the course, sometimes, I thought I was not going to handle it [...] sometimes you study, study, study, try your best and go bad, don't see results , so, no one gets excited with that, right? So giving up the course and do something else have already crossed my mind [...].

The speeches show that the main reason that made some students think to drop the course were the difficulties encountered in performing the disciplines. To join a course in the field of exact sciences, the student needs to have a good mathematical background and what was observed during the research is that students enter with a deficient training.

The physics course is considered difficult and problematic due to the high dropout rate. According to Mendes *et al.* (2007), the reasons why students have problems in learning Physics are: insufficient training and inadequate working conditions of secondary school teachers; inefficient methods of teaching; and poor physical facilities in schools and universities, especially in science laboratories. In addition, students receive inadequate training when learning mathematics. All these problems make students have difficulties when they come to Higher Education. In the opinion of Ferreira *et al.* (2009, p. 2)

> In some courses, such as in Engineering, the academic student begins Physics subject and calculus simultaneously, which implies that before he had the chance to learn some concepts in the calculation since it is required to use them in Physics. This undoubtedly compromises the monitoring and development of the course by the student. This fact leads to the following assertion: the low approval rate in Physics of students in higher education is due to their unpreparedness in manipulating mathematical tools.

In physics, the situation is similar: the students are studying Physics I and Calculus I in the first semester of the course and this makes them have to apply the concepts and results of Calculus in Physics, without at least having completed satisfactorily. With the lack of mathematical background that students have because of deficit of high school, students find it difficult to follow the course, and therefore think of dropping it.

Two students said they had thought to leave the course due to low teacher salaries, according to the speeches:

> ***A13**: I've thought several times [...] by the fact of not making too much money, not having much incentive for someone to come to me and say: do it and you'll be fine [...].*

> ***A16**: yes [...]it is a course that you have to devote a lot, have to study a lot and sometimes you won't get something so very profitable later. The public school teacher does not earn well, you know? [...].*

> ***A13**: [...] I think because they do not make as much money as other courses like engineering, medicine [...] and also by the difficulty, I had no idea before entering.*

Many young people have not been interested in the Licentiate Degree courses and this occurs "as a result of low wages, from inadequate education, violence in schools and the absence of a motivating prospect of continuing education associated with an attractive career plan" (RUIZ , RAMOS, HINGEL, 2007, p. 17). This fact became clear in the speech of students who are concerned about the lack of appreciation of teachers in Brazil.

One student said he thought about giving up because, in the beginning of the course, he realized that it was not what he thought it was.

> ***A15**: [...] I thought about quitting. [...] because in the first year, I thought: it's the first year after that it is going to change, right? There has not changed and remained the same then I saw it was not...*
>
> *[...] Sometimes hits a will, but it does not worth, I guess because I graduate next year, even though I really do not want to teach, but who knows, if I need to teach [...] (response of a student when questioned if he is still thinking about quitting).*

A15 makes it clear that the course does not face his expectations, and so he thought of quitting. Asked if he is still thinking about quitting the course, the student answers no, because it is already in the third year and he already completed more than half of the course. The student reinforces that does not want to teach, but it is an option he has, if he needs. The interview showed that this student desire is to get another college degree after completing the Physics course.

Aiming to understand why the dropout rates in Physics courses are so great, the students were questioned the following question: Why do you think students often drop out of the Physics course?

The answers showed that most are disappointed with the course because the students think it is different than it really is. Another reason would be the difficulty of the course. Observe a speech representing this thought:

> ***A14**: [...]it is totally different than what the person expected, is a very great shock you get out of a school, public or private, and getting into college, in high school you always have teachers upon you and here is that you have to go after [...] the course is very difficult in itself involves a lot of math and such, then sometimes the person does not have a good preparation in mathematics [...].*

The student reports that, in his opinion, the dropout occurs due to lack of adaptation of the student or the lack of someone to accompany him at all times or the difficulty of the course.

What caught our attention in this speech was: in high school you always have teachers upon you and here is what you have to go after. In that speech is clear that the presence-based course students will also have to develop independence, because teachers are not

available at all times. What causes students to feel alone and to leave the course. In other words, this lack of teacher "monitoring" the student is not only a characteristic of distance learning courses, but graduation courses in general, because students need to learn to "go after".

About the dropouts due to the course difficulty, students say:

> ***A18**: I believe it is similar for some reason like mine, because several times I thought I'd stop studying Physics because of these difficulties that arose during the course, the first year was quiet [...] but then when the second year started and the subjects were more theoretical, more difficult, requiring more dedication, more study and regularity of study I became too busy, then when you have this difficulty of dependence and everything, it seems that multiplies the difficulty of the course, the problem is not the Physics course, people say that the is very difficult, I say no, the greatest difficulty of course is finding time and use your time well and learn the subjects well [...].*

As in the testimony of students who thought about quitting the Physics course, the difficulty with the contents also appeared frequently in the discourse about what the students think about the high dropout rate.

It is highlighted in the testimony of A18 the sentence "the problem is not the Physics course [...] the greatest difficulty of course is you can take the time and use your time well," because it expresses well the fact that the course requires organization and dedication of the students, not just for the student of Distance Education, but also the student's in the present-based course.

Some students believe that the course attracts students who could not get in other courses, such as engineering, but in time these students realize that the Physics course is not what they wanted to be as shown on A19 discourse.

> ***A19**: I think it is because some of them think it's not what they wanted, others because they can not handle it, find it very difficult to [...] and some ones that also come in order to want to transfer to engineering, I have many friends who try this and are unable to do it and give up.*

But it is observed that, in all the speeches words as *difficult* and *difficulty* are present. Therefore, according to the survey, it is concluded that the main reason that makes students quit the Physics course is the difficulty with the course subjects and the lack of basic math, which they must have to understand the content covered in the course.

7. DISTANCE EDUCATION STUDENT' SPEECH ABOUT THE DROPOUTS

This item aims to present the opinion of students Distance education Physics course on dropouts in progress. First, we asked the students if they have ever thought about quitting the Physics course. Table 9 presents the categories of responses found.

Table 9: Categories of answers from the students enrolled in the Distance Education Physics course to the question: *Have you ever thought about quitting the Physics course?*

Categories	1st year	3rd year	1st and 3rd years
Yes	6	8	14
No	4	2	6

By Table 9, it is observed that most students who are enrolled in the distance Physics course have ever thought about quitting the course. This will appear more frequently in the distance course, while 50% of students interviewed the presence-based course have ever thought about quitting the course, 70% of the distance education students expressed this desire.

The speeches showed that the biggest reason why students thought about quitting graduation were the difficulties of the course, whether in relation to content, lack of adaptation to distance learning system or lack of time to devote to the course. Here are some speeches for analysis:

> ***A35***: *Well sometimes yes, you know? (laughs) [...] then sometimes things are so hard, [...] it makes you want to give up it all. People what am I doing?*

> ***A36***: *we think a thousand times to give up [...] those difficult moments of tests, the grade is bad, the DPs and everything, so ... the personal difficulties that each one has then end up messing up.*

> ***A37***: *Yes [...] Just by difficulties in learning, especially Calculus. [...] In the first year I was quiet ok, in the second, some disciplines that I had more difficulties came, then the dependencies have come, I did not quit because I got to the third year and said: I got so far, there is no time to give up, but if I was in the first year I would.*

The highlighted words represent why students have thought about quitting the course. Just like in face of the difficulties of the course are the main reasons for the dropouts.

In speech A36 phrase *"the personal difficulties that each one has"* shows that, besides the difficulties in relation to content, personal problems also interfere. Vianney (2006), when comparing the profile of students in some distance graduation courses and presence-based graduation, found that one of the main differences between students enrolled in both modalities were the average age of those investigated students. In other words, the majority of students enrolled in distance learning course is older, so students already work, are married and have children, making the time these students have to devote to the course very short.

Some students said they also thought about quitting since there is too many dropouts by students in the course, which makes some students feel alone. Observe:

> ***A21***: *Yes [...]it is tricky, because too many people are quitting, so, I´m kind of alone [...]it is bad that you do not have someone to talk, to answer your questions, then have lots and lots of desistance anyway.*

***A28**: it passed when everybody started to quit, that was going together, right? [...] When everyone started quitting, I saw that I'd be almost alone, I thought about quitting too, but then I thought I invested so much, I already spent so much, I'll give up for what?*

The speeches show that the fact that many students have quit influences others because they feel alone and discouraged to continue the course. When students say "it's bad you do not have someone to talk", "I am kind of alone", make clear that, in distance learning courses, students have contact with each other. According to Martins and Moço (2009), the society believes that in the courses in distance education modality students are isolated and do not interact with each other, but this is just a myth, because it is a requirement of MEC that moments of interaction among students at the support learning centers are organized, through the complementary activities.

Just as some students of the present-based course, some students of distance education thought to quit the course because they were not feeling satisfied with the inadequate conditions of education and the income of teacher's salary in Brazil, as shown in the following saying:

***A29**: Yes, I have thought, sometimes I thought. [...] You are working, and then you see. God! I will work like a dog to be a Basic Education teacher? For high school, unmotivated attendance. So I've thought it a few times.*

***A30**: [...] I thought about quitting because, well, I'll be even... to me the Physics course, I'm talking about high school, for the government what will happen? My salary is the same, I already have a graduation, then it will not improve anything for me, If I have two or ten degrees, masters, doctorate, for the government it does not matter[...].*

The statements of A29 and A30 make it clear that the current situation of education in Brazil has not motivated young people to pursue careers as teachers. Those who start the course often end up quitting because of the difficulties faced during graduation are not compensated after its completion.

A survey commissioned by Victor Civita Foundation (FVC) to Carlos Chagas Foundation (FCC), which heard 1.501 3rd year students of 18 public and private schools in eight cities, showed that only 2% of respondents have students as the first option for college courses directly related to performance in the classroom. The study also showed that teaching was not abandoned early in the career choice process. In total, 32% of students surveyed have thought about beign teachers sometime, but changed his mind and ended up prioritizing other courses by factors such as low pay, quoted on responses from 40% of those who considered the career, social devaluation of the profession and disinterest and disrespect of students, both mentioned by 17% of students (RATIER, 2010).

Some testimonies showed that tutors are important figures to motivate students because some students reported that they have not quit due to the ongoing support of tutors, as the speeches of A31 and A33:

***A31**: Many times, I did not give up because sometimes the (tutor) sent message [...].*

> ***A33**: Ah, many times [...] there was a time that I was two months without going to college [...] went there to return to my books, you know? That I had go, then, the tutor talked to us, with me, right? [...].*

In other words, the speeches show that the present tutor plays a very important role in the formation of the distance learner. According to Leal (2005, p. 3)

> The Tutor is an educator at distance. The one who coordinates the selection of content that discusses learning strategies, which promotes the creation of academic pathways, which discusses the knowledge, establishing a dialogue with the student, which mediates learning problems suggests, instigates, accepts.

Therefore, the present tutor provides a strong incentive for distance students, because they are the ones who have more contact with students of each course and, thus, the dialogue between student and tutor is very effective in encouraging a student to continue with the course.

As students of the presence-based course, the distance education students also voiced their opinions on dropouts the Physics course. Most students attributed the dropouts to the difficulty of the course and the fact that many students enter the course thinking it would be easier for the distance. See some speeches:

> ***A21**: [...] perhaps because of that issue of thinking that maybe it would be easier [...]once enrolled in the course there\, it was seen it was **not what we thought it was**, just giving up, jumping out, you know?*
>
> ***A33**: [...] some hoped that the course would be easier or [...] that **we could just slap it together** [...].*
>
> ***A34**: [...] when we started, the time when it started to get difficult everyone said: **but in such place it is not like this**, there is not like this [...].*
>
> ***A35**: I know that there are people who enrolled thinking "oh, I'll do, **I'll take the diploma and ok**", then saw that it was not like that and quit [...].*

The speeches show that many enrolled in the course thinking that it would be more simple, the phrases in bold reinforce this idea. Martins and Moço (2009) spoke about some myths about distance learning and two of them are "The diploma is easy" and "Evaluations are not difficult", that is, these are rumors that circulate in society about courses in distance education modality and unfortunately, many students think that if they attend a graduation course held at distance, they will not have to struggle, according to the expression "*slap it together*[14]" mentioned by A33, or they obtain a diploma easily, according to A35 when the phrase *"I'll take the diploma and ok"*was mentioned.

It is noteworthy that the degree of a distance course is not easy, because the student has to devote much as a student who does

[14] The expression slap it together refers in Brazilian Portuguese to the expression "fazer nas coxas" which means "*make hastily and carelessly*" . The first tiles made in Brazil were molded on slaves thighs . As slaves varied in size and physique, the tiles were uneven. Available at <http://www.dsignos.com.br/curiosidades/DS_Expressoes%20explicadas.pdf> Accessed 29 May. In 2012.

the same course in presence-based modality. Carlos Eduardo Bielschowsky, while he was secretary of Distance Education of MEC, said the graduate and postgraduate diploma, whether on present-based or distance modality are equivalent. Thus, anyone who thinks a good distance course is easy, you may end up disappointed with the degree of difficulty and not move forward (MARTINS e MOÇO, 2009).

Some students said they think the dropout occurs due to the difficulty of the course, as well as in the present-based course this category also appeared frequently. Note.

> ***A38**: [...] because I think the calculus subject is demanding, [...] Calculus scared me a lot, [...] I think they scare us with the test on the first impact, the tests are very difficult [...].*

In other words, the physics course is a course that requires a mathematical background of the student and through the discourse of students, it was found that most of them lack this training and therefore the course is difficult and not all of them have a willingness to engage enough to recover this lack of mathematical background, quitting the course. This was detected in students of presence-based and distance courses.

FINAL CONSIDERATIONS

The data presented in the article show that dropouts of the Physics course from State University of Maringa is also worrying. In the presence-based Physics course an average of 21 students per year are graduating, or approximately 35% of the vaccancies offered. In the distance education course, despite being a new course and not presenting a lot of data, it appears that dropout rate is also high. Therefore, it is concluded that the dropout exists and the situation is alarming in both learning modalities.

About the testimonials of students participating in the research, it is concluded that the main reason that makes students quit the Physics course is the difficulty with the course subjects and the lack of mathematical background, due to a high school deficit.

Another reason often cited in speeches by students from both modalities was the devaluation of the professional because there is a perception by students that stress inferred for conducting the course is not compensated financially nor socially.

The physics course is a course in the field of Exact, requires a solid mathematical background, as already mentioned, the high school has not prepared their students well, so both students of presence-based course, as the students of distance education, are complaining about the difficulty of the course, when, in fact, what is missing is the basis to perform successfully on the Physics course.

REFERENCES

ALVES, A. P. V.; SALES, S. B. A evasão escolar na modalidade de ensino a distância: o pólo presencial de Itapemirim – ES. In: SIMPÓSIO INTERNACIONAL DE EDUCAÇÃO A DISTÂNCIA/ENCONTRO DE PESQUISADORES EM EDUCAÇÃO A DISTÂNCIA, 1., 2012. **Anais**... São Carlos: UFSCar, 2012. Disponível em: <http://sistemas3.sead.ufscar.br/ojs/index.php/sied/article/viewFile/264/136>. Acesso em: 28 jul. 2014.

ARRUDA, S. M.; UENO, M. H. Sobre o ingresso, desistência e permanência no curso de Física da Universidade Estadual de Londrina: algumas reflexões. **Ciência & Educação**, Bauru, v. 9, n. 2, p. 159-175, 2003.

BARROSO, M. F.; FALCÃO, E. B. M. Evasão universitária: o caso do Instituto de Física da UFRJ. In: ENCONTRO NACIONAL DE PESQUISA EM ENSINO DE FÍSICA, 9., 2004. **Atas**... Jaboticatubas: SBF, 2004. Disponível em: <http://www.sbf1.sbfisica.org.br/eventos/epef/ix/atas/comunicacoes/co12-2.pdf>. Acesso em: 18 jul. 2011.

BRUNO-FARIA, M. de.; FRANCO, A. L. Causas da evasão em cursos de graduação em Administração em uma universidade pública federal. **Revista Teoria e Prática da Educação**, Maringá, v. 14, n. 3, p. 43-56, set./dez. 2011. Disponível em: <http://periodicos.uem.br/ojs/index.php/TeorPratEduc/article/view/18487/9641>. Acesso em: 28 jul. 2014.

CAMPOS, S. L. de. **Análise da evasão no curso de Física da UEMS**. 2010. 74 f. Trabalho de Conclusão de Curso (Licenciatura em Física) – Universidade Estadual do Mato Grosso do Sul, Dourados, 2010. Disponível em: <http://fisica.uems.br/curso/tcc/tcc2010/simone.pdf>. Acesso em: 19 jul. 2011.

COMARELLA, R. L. **Educação superior a distância**: evasão discente. 2009. 146 f. Dissertação (Mestrado em Engenharia e Gestão do Conhecimento) – Universidade Estadual de Santa Catarina, Florianópolis, 2009.

GOMES, F.; MOURA, D. Investigando as causas da evasão na licenciatura em Física do CEFET-RN. In: ENCONTRO DE PESQUISA EM ENSINO DE FÍSICA, 11., 2008, Curitiba. **Atas**... Curitiba: UTFPR, 2008. Disponível em: <http://www.sbf1.sbfisica.org.br/eventos/epef/xi/sys/resumos/T0207-1.pdf>. Acesso em: 31 mar. 2011.

FERREIRA, F. C.; CAÍRES, A. R. L.; SILVA, A. A. da; OLIVEIRA, S. L. de. Diagnóstico de dificuldades conceituais em Física apresentadas por acadêmicos ingressantes em cursos da UFGD. In: ENCONTRO NACIONAL DE PESQUISA EM EDUCAÇÃO EM CIÊNCIAS, 7., 2009, Florianópolis. **Atas**... Florianópolis: UFSC, 2009. Disponível em: <http://www.foco.fae.ufmg.br/viienpec/index.php/enpec/viienpec/paper/viewFile/1258/163>. Acesso em: 24 jul. 2012.

FUNDAÇÃO CARLOS CHAGAS; FUNDAÇÃO VITOR CIVITA. **Atratividade da carreira docente no Brasil**: relatório de pesquisa. São Paulo, 2009.

GUERRA, V. M. L. Reflexão sobre alguns conceitos da análise do discurso de linha francesa. **Revista Ensaios e Ciência**, Anhanguera, v. 7, n. 1, p. 217-232, 2003.

INSTITUTO NACIONAL DE ESTUDOS E PESQUISAS EDUCACIONAIS ANÍSIO TEIXEIRA. **Estatísticas dos professores no Brasil**. Brasília: 2003.

JOELE, R. P.; CASTRO, C. S.; BRITO, L. P. Elementos motivadores para a evasão no curso de Física da UFPA. In: SIMPÓSIO NACIONAL DE ENSINO DE FÍSICA, 19., 2011, Manaus. **Atas**... Manaus: SBF, 2011. Disponível em: <http://www.sbf1.sbfisica.org.br/eventos/snef/xix/sys/resumos/T0435-1.pdf>. Acesso em: 31 mar. 2011.

LEAL, R. B. A importância do tutor no processo de aprendizagem a distância. **Revista Iberoamericana de Educación**, v. 36, n. 3, 2005. Disponível em: <**http://www.rieoei.**

org/deloslectores/947Barros.PDF>. Acesso em: 29 maio 2012.

MAIA, M. de C.; MEIRELLES, F. de S.; PELA, S. K. **Análise dos índices de evasão nos cursos superiores a distância do Brasil**. 2004. Disponível em: <http://www.abed.org.br/congresso2004/por/pdf/073-TC-C2.pdf>. Acesso em: 28 jul. 2014.

MARTINS, A. R.; MOÇO, A. Educação a distância vale a pena? **Nova Escola**, 227 ed., nov. 2009. Disponível em: <http://revistaescola.abril.com.br/formacao/formacao-inicial/vale-pena-entrar-nessa-educacao-distancia-diploma-prova-emprego-rotina-aluno-teleconferencia-chat-510862.shtml?page=5>. Acesso em: 30 mar. 2012.

MARTINS, R. X.; SANTOS, T. L. P.; FRADE, E. das G.; SERAFIM, L. B. Por que eles desistem? Estudo sobre a evasão em cursos de licenciatura a distância. In: CONGRESSO BRASILEIRO DE ENSINO SUPERIOR A DISTÂNCIA, 10., 2013, Belém. **Anais**. Belém: UFPA, 2013. Disponível em: <http://www.aedi.ufpa.br/esud/trabalhos/oral/AT5/114151.pdf>. Acesso em: 28 jul. 2014.

MENDES, R. M. B; MENDES, G. M. F.; MACEDO FILHO, R. B.; PASCHOAL, C. W. de A. Dificuldades dos alunos do ensino médio com a Física e os físicos. In: SIMPÓSIO NACIONAL DE ENSINO DE FÍSICA, 17., 2007, São Luís. **Atas**... São Luís: SBF, 2007. Disponível em: <http://www.cienciamao.usp.br/tudo/exibir.php?midia=snef&cod=_dificuldadesdosalunosdoe>. Acesso em: 24 jul. 2012.

MOREIRA, P. R.; GLÓRIA, L. G. L.; BARBOSA, W. J. C.; COSTA, C. G. da; CARVALHO, R. O. de; VIVEIRO, G. A. Evasão escolar nos cursos de graduação a distância. In: CONGRESSO BRASILEIRO DE ENSINO SUPERIOR A DISTÂNCIA, 10., 2013, Belém. **Anais**... Belém: UFPA, 2013. Disponível em: <http://www.aedi.ufpa.br/esud/trabalhos/oral/AT5/114373.pdf>. Acesso em: 28 jul. 2014.

PEREIRA, L. J. M; LIMA, M. C. A. Evasão no curso de Física da UFMA nos primeiros períodos do curso. In: SIMPÓSIO NACIONAL DE ENSINO DE FÍSICA, 17., 2007, São Luís. **Atas**... São Luís: SBF, 2007. Disponível em: <http://www.sbf1.sbfisica.org.br/eventos/snef/xvii/sys/resumos/T0362-1.pdf>. Acesso em: 31 mar. 2011.

PINTO, J. A.; MASSUNAGA, M. S. O. Professores de Física: uma tribo ameaçada de extinção. In: SIMPÓSIO NACIONAL DE ENSINO DE FÍSICA, 16., 2005, Rio de Janeiro. **Atas**... Rio de Janeiro: SBF, 2005. Disponível em: <http://www.sbf1.sbfisica.org.br/eventos/snef/xvi/cd/resumos/T0058-1.pdf>. Acesso em: 31 mar. 2011.

RATIER, R. Ser professor: uma escolha de poucos. **Nova Escola**, 229 ed., jan./fev. 2010. Disponível em: <http://revistaescola.abril.com.br/politicas-publicas/carreira/ser-professor-escolha-poucos-docencia-atratividade-carreira-vestibular-pedagogia-licenciatura-528911.shtml>. Acesso em: 28 maio 2012.

RIBEIRO, B. V.; SILVESTRE, C. H. C.; SANTOS, D. D. de A.; CUNHA, D. C. N. da; LIMA, F. R. M.; GONÇALVES, G. C.; MENDES, R. F. P.; CAMPOS, V. P. P.; PORTILHO, O.; PEDROZA, A. C. **Um estudo da evasão no curso de graduação em Física da UnB**. 2008. 138 f. Relatório (Graduação em Física) – Programa de Educação Tutorial,

Universidade de Brasília, Brasília, 2008. Disponível em: <http://www.fis.unb.br/relatorio_a_comissao_de_graduacao.pdf>. Acesso em: 18 jul. 2011.

RUIZ, A. I.; RAMOS, M. N.; HINGEL, M. **Escassez de professores no Ensino Médio: propostas estruturais e emergenciais**. 2007. Disponível em: <http://portal.mec.gov.br/cne/arquivos/pdf/escassez1.pdf>. Acesso em: 1 fev. 2011.

SILVA, A. M. da; MARQUES, A. L. F. Evasão em um curso de licenciatura em física, modalidade a distância. In: SIMPÓSIO INTERNACIONAL DE EDUCAÇÃO A DISTÂNCIA/ENCONTRO DE PESQUISADORES EM EDUCAÇÃO A DISTÂNCIA, 1., 2012, São Carlos. **Anais**... São Carlos: UFSCar, 2012. Disponível em: <http://sistemas3.sead.ufscar.br/ojs1/index.php/sied/article/view/180>. Acesso em: 29 jul. 2014.

SILVA, W. M.; ALMEIDA, A. A. C.; SILVA, J. D.; PEREIRA, M. P.; PEREIRA, V. O. B.; RIBEIRO, L. D. M.; GONZALES, M. M.; PEREIRA, A. R.; SILVA, A. V. Uma reflexão sobre a evasão no curso de Física do campus Catalão da UFG. In: SIMPÓSIO NACIONAL DE ENSINO DE FÍSICA, 19., 2011, Manaus. **Atas**... Manaus: SBF, 2011. Disponível em: <http://www.sbf1.sbfisica.org.br/eventos/snef/xix/sys/resumos/T0032-1.pdf>. Acesso em: 31 mar. 2011.

VIANNEY, J. **As representações sociais da educação a distância**: uma investigação junto a alunos do ensino superior a distância e a alunos do ensino superior presencial. 2006. 330 f. Tese (Doutorado Interdisciplinar em Ciências Humanas) – Universidade Estadual de Santa Catarina, Florianópolis, 2006.