INTERNET-CONDUCTED DISTANCE EDUCATION: "SENTINEL LYMPH NODE, PREVENTION, EARLY DIAGNOSIS AND BIOPSY – A NEW TECHNIQUE FOR APPROACHING BREAST CANCER"*

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Abstract **OBJECTIVE: The present study was aimed at developing and delivering a course in the modality "Internet-conducted distance education". MATERIALS AND METHODS: The theme "Sentinel lymph node, prevention, early diagnosis and biopsy – a new technique for approaching breast cancer" was utilized as an application model, and the didactic material for distance-learning was targeted to a selected audience of physicians involved in the treatment of breast cancer. The course was structured in a virtual learning environment, allowing interaction among participating students. RESULTS: The coursework took place over a 12-week period. Nine gynecologists with at least eight years of professional experience participated in some way in the course, but only two of them accomplished exercises and interacted. In the distance-education modality, the course reached eight cities in four Brazilian states. A full engagement did not occur, although most of participants have remained until the end of the course. Possibly, there was a lack of motivation. CONCLUSION: The results demonstrate that it is necessary to break the barriers to the culture related to this form of learning. A pro-active participation of the coordinator is essential for integrating and mobilizing the participants.**
Keywords: Continuing medical education; Telemedicine; Distance education; Internet; Course management system.

Resumo *Educação a distância mediada pela internet: "Linfonodo sentinela, prevenção, diagnóstico precoce e biópsia – nova técnica de abordagem do câncer de mama".*

OBJETIVO: O objetivo deste estudo é o desenvolvimento e a aplicação de um curso na modalidade "Educação a distância mediada pela internet". MATERIAIS E MÉTODOS: Foi utilizado o curso "Linfonodo sentinela, prevenção, diagnóstico precoce e biópsia – nova técnica de abordagem do câncer de mama" como modelo de aplicação. O material didático para a modalidade "Educação a distância" foi elaborado visando a um público composto por médicos envolvidos com o tratamento do câncer de mama. O curso foi estruturado em ambiente virtual de aprendizagem, um espaço virtual que permitiu a interação entre os participantes. RESULTADOS: A duração do curso foi de 12 semanas. Iniciou-se com nove participantes, médicos ginecologistas com pelo menos oito anos de experiência profissional. Todos os alunos participaram de alguma forma, dois realizaram exercícios e interagiram. O alcance do curso pelo método atingiu quatro estados e oito municípios. Não ocorreu adesão integral dos alunos, apesar de a maioria permanecer até o fim do curso. Possivelmente, não houve motivação suficiente para participação nas atividades propostas. CONCLUSÃO: Os resultados mostram que é necessário quebrar as barreiras da falta de cultura relacionada a esta forma de aprendizagem. É fundamental a participação facilitadora do coordenador para integração e mobilização dos participantes.
Unitermos: Educação médica continuada; Telemedicina; Educação a distância; Internet; Ambiente virtual de aprendizagem.

INTRODUCTION

Distance education is a method that offers a more continuous updating for health professionals, and may be defined as a teaching/learning method where the student is given access to a previously prepared instructional material, and where the learning process is conducted by a professor at distance. It is important to note that distance education is not anymore characterized by the distance, considering that the virtuality allows more and more effective meetings to occur, in fact, allowing the education to happen[1].

In practical terms, the integration of the new information technology into the imaging diagnosis has allowed the radiologists to "export" their abilities, sharing information, reducing costs, and improving the efficiency, quality and coverage of their services. Different formats of continued medical education may be associated with telemedicine[2]. Programs for teaching radiology and nuclear medicine may be quite adaptable to distance education.

In Brazil, programs of continued medical distance education are a relatively recent issue, but in Europe, United States of America and Canada, they have already

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Received September 26, 2006. Accepted after revision December 4, 2006.

existed for a long time. Considering the huge territorial extent of our country, the internet-conducted distance education arises as a viable alternative for knowledge dissemination[3].

After the internet consolidation in the eighties, academic-specific systems and softwares (the so called virtual learning environments) were developed[4]. Usually, virtual learning environments are constituted by integrated tools contemplating the three great groups of general distance education tools: administration, coordination and communication. In this course we have chosen to utilize the virtual learning platform called "modular object-oriented dynamic learning environment" (Moodle), because, besides being a free software, it is extremely easy to use and meets our needs as naive users. This virtual learning environment includes a community with more than 130,000 registered users, running in 75 languages, across 169 countries, and being utilized by 197 Brazilian institutions[5]. Moodle offers tools for monitoring the browsing activities of each participating student, identifying the web pages visited as well as the access duration. The software allows the reconstruction of the student's browsing activities and respective session-browsing times.

The present study idealized a course whose theme was "Sentinel lymph node, prevention, early diagnosis and biopsy – a new technique for approaching breast cancer" in the internet-conducted distance education modality. The model was aimed at involving the participating students in an interactive distance learning experience with other participants, stimulating information exchange.

The development of the course required a research on theoretical, pedagogical and technological foundations of the distance education methodology. It was necessary to overcome the four classical steps in distance-education: planning, design, production and services[6]. Also, it was necessary to investigate, identify and analyse a range of non-presential pedagogical strategies related to the learning in the distance education process, to allow the adaptation of the didactic material available[7]. The inclusion of hypertexts allowed a direct access to other texts and contents, enhancing the interaction dynamics and velocity of access to multiple contents[8]. The model was based on the collaborative learning methodology, with simultaneous involvement of the participating students, including, for example, the study of clinical cases with questions to generate considerations on the matter in a forum as an open space aimed at broadening the discussions[9,10].

MATERIALS AND METHODS

The general coordination for the course was undertaken by a single professor who was responsible for gathering didactic material and adapting it to the distance education methodology, besides monitoring the compliance with the established timetable, conducting the interface with the informatic team, and offering the course in the period between October and December/2005.

The course was structured into five sections: the first one, called "Acquaintance space", included a panel where news and tips were continuously posted, and a discussion forum was utilized as a "coffee shop" for ideas exchanging. The second one was called "Learning module" and was utilized for presentation of didactic classes. The third one, called "Activities", included exercises for knowledge retaining configured as "clinical case". The fourth section was called "Interaction space", with forums for debates on clinical cases. The fifth section, "Library", was utilized for publishing references, texts and articles aimed at deepening the student's knowledge about the themes approached by course.

The instructional material was hierarchically and sequentially made available for the students in the form of hypertext. Fourteen 30-minute theoretical classes and 12 activities divided into five clinical cases and seven questions were offered to be commented in the corresponding discussion forums (Figure 1).

During the classes, links were made available to provide immediate access to the proposed exercises. The student could access the links to solve the exercises or to proceed in the reading of the text. For resolution of the proposed questions and clinical cases, discussion forums were opened up aiming at broadening a debate based on the collaborative learning concept. The participating students were supervised by the course coordinator who was also responsible for enhancing the interaction among them. Periods were suggested for students to post comments on the discussion forums. For each comment posted, the student received an electronic message automatically sent by the virtual learning environment. Every time a new material was published, the coordinator sent e-mails inviting the students to participate in the activities.

RESULTS

After publicizing during the Brazilian Congress of Mastology, in September/

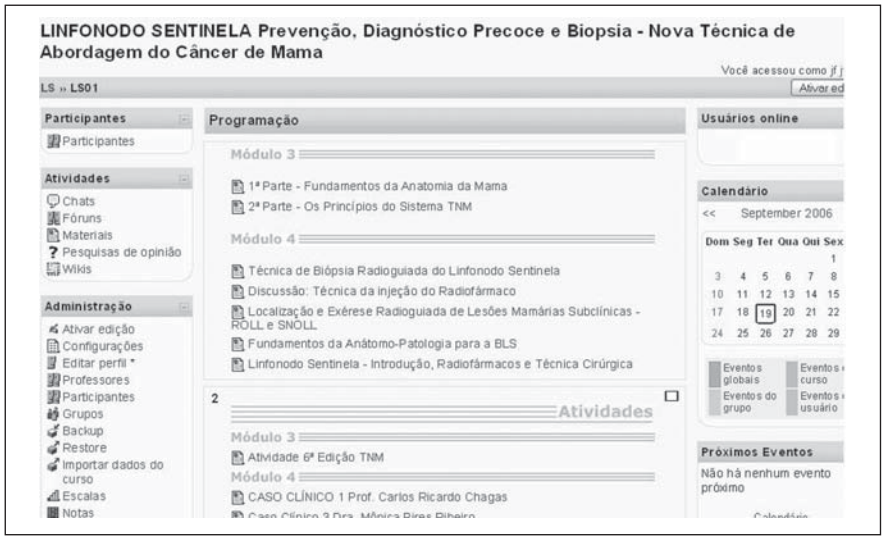

Figure 1. Instructional material made available to students at virtual learning environment.

2005, 15 students applied for the course. Two of these students had no e-mail address and for this reason they gave the course up; other four students were not able to submit the electronic application in the virtual learning environment and, unfortunately, could not qualify for the program. The course was started with nine students; all of them were physicians with Title of Specialist in Gynecology and Obstetrics, and four of them in Mastology, working in mastology clinics, two in top positions. The ages ranged between 32 and 54 years, and the professional experience, between eight and 27 years. Five were men and four were women. In the distance-education modality, the course reached eight cities in four Brazilian states (Figure 2).

The participating students highlighted the opportunity to familiarize with the sentinel lymph node biopsy as the main motivational factor for them to participate in the course.

During the course, the number of visits to the virtual learning environment varied according to each module contents. The first module was accessed by all of the students enrolled in the course. The mean browsing time was 15 minutes per access to the virtual learning environment, most frequently occurring after 10:00 PM.

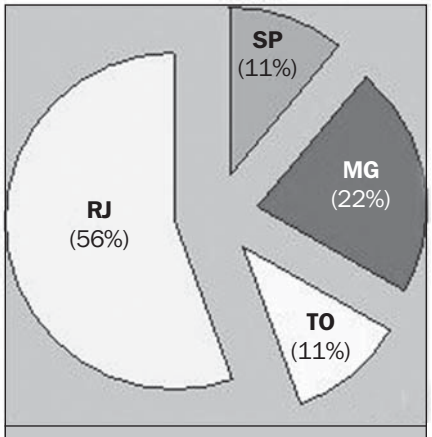

Figure 2. Reach of the course (in the distance education modality): eight cities in four Brazilian states.

The next two modules discussed aspects related to the early breast cancer detection, the Breast Imaging Reporting and Data System (BI-RADS®)[11], the management of non-palpable lesions and the role of the TNM staging (classification of malignant tumors)[12]. A decrease in the browsing time of these modules contents was observed. Generally the browsing time was very short, indicating a possible lack of interest from the students probably because they already knew the subject matter. Two students completed the exercises, three accessed the whole content but did not participated in the activities, and four failed to access the course.

In the fourth and last module, when the sentinel lymph node biopsy technique was approached, there was a considerable increase in the browsing time per student, indicating that this topic met the students' personal interest.

A section of presential class and a theoretical evaluation were scheduled for February/2006. The students would be given the opportunity to experience practical activities related to sentinel lymph node biopsy, and would be submitted to a written test. None of the students attended this activity.

The time spent by the coordinator for monitoring the course was approximately 10–15 minutes/day, from Monday to Friday. Most of times, this was enough to check the students' accesses and feedbacks.

The present study was experimental. Data and results are available at the site of the course[13]. Certainly, additional studies are necessary to evaluate the effectiveness of the distance education method for professional updating in medicine.

DISCUSSION

In distance education, a detailed planning covering all the phases of the process is critical. There is no possibility to change the teaching strategy, and this implies a reduction in the flexibility of the original course objectives. Considering the experimental character of the present study, the course was offered at no cost, and no certificate was given to participating students. From the very beginning, we knew that it would be very difficult to keep the students motivated[14–17]. Despite the fact that the sentinel lymph node biopsy is a new technique, sufficient to attract the students, it could not guarantee their effective participation in the course.

Despite a well detailed program including a timetable and time load, an evaluation of the students' profile demonstrated that their higher expectation was related to the sentinel lymph node biopsy technique that was presented only in the fourth module of the course. Most probably, this fact has discouraged the majority of students, causing a decrease in the number of accesses and in the browsing time in the virtual learning environment.

The utilization of pedagogical collaborative learning strategies has proved to be effective for increasing the level of motivation of the participating students, and enhancing the accomplishment of the proposed activities[9,18,19]. However, this method is based on the assumption that the students must be interested in their activities, and such activities must be meaningful at personal level[19]. Main factor that moves professionals up is the necessity of being updated in the labor market[14–17,20].

As regards the communication among participating students, the course was approached as an asynchronous experience. There was no appointment. In spite of the availability of a chat board in the virtual learning environment, this resource was not utilized because this was the first experiment of the team with distance education, and real time activities would have required a higher technical level. On the other hand, asynchronous tools do not require the simultaneous presence of the participating students and information may be accessed at their leisure. The published information is available to be accessed by the group. These materials are more carefully prepared and, generally, the final product presents a higher quality. However, for being asynchronous, it is easier for the students prioritizing other activities and temporarily to abandon the course[21].

For evaluating and validating resources and strategies, it was necessary to make adjustments according to student's availability to attend the course, mean connection

time, questions/answers agility, and participation in forums. A higher dispersion of the student's attention was clearly observed during the temporary absences of the course coordinator, demonstrating the fragility of a process supported only by a single person, and not by a team.

Based on the difficulties found during the course and, with the purpose of refining the program, it may be concluded that: 1) the knowledge of the students´ profile facilitates the dialogue and the learning process that must be adapted to their rhythms and differences; 2) the course organization must provide clear information and evaluation criteria, besides a clearly defined timetable; 3) the method made the students to autonomously manage their learning; 4) in terms of value-added, it is necessary to create an engaged virtual community to continue the sharing of experiences, even after the course completion.

Acknowledgments

The authors thank Dênia Falcão de Bittencourt, Psichologist and Professor for the Post-Graduation Course of Distance Education Methodology at UnisulVirtual/Unisul; Sociedade Brasileira de Mastologia (SBM) (Brazilian Society of Mastology) – RJ Section; ProEcho – Diagnóstico por Imagem; and Contempory – Soluções em Informática.

REFERENCES

1. Litwin E. Das tradições à virtualidade. In: Litwin E, organizadora. Educação a distância – temas para o debate de uma nova agenda educativa. Porto Alegre, RS: Artmed, 2001;13–22.
2. Vianney J, Torres P, Silva E. A universidade virtual no Brasil – o ensino superior a distância no país. Tubarão, SC: Ed. Unisul, 2003;15–43.
3. Christante L, Ramos MP, Bessa R, Sigulem D. O papel do ensino a distância na educação médica continuada: uma análise crítica. Rev Assoc Med Bras 2003;49:326–329.
4. Gerling CA, Passerino LM. Gerenciamento em ambientes virtuais de educação a distância. Centro Interdisciplinar de Novas Tecnologias na Educação Cinted-UFRGS 2005;3(2). [Acessado em: 16/9/2006]. Disponível em: http://www.cinted.ufrgs.br/renote/nov2005
5. Modular object-oriented dynamic learning environment – Moodle. Comunidade internacional do ambiente Moodle. [Acessado em: 12/9/2006]. Disponível em: http://www.moodle.org
6. Bittencourt DF. A construção de um modelo de curso "lato sensu" via internet – a experiência com o Curso de Especialização para Gestores de Instituições de Ensino Técnico. (Dissertação). Florianópolis, SC: UFSC/Senai, 1999. [Acessado em: 12/9/2006]. Disponível em: http://www.eps.ufsc.br/disserta99/midia99.htm
7. Soletic A. A produção de materiais escritos nos programas de educação a distância: problemas e desafios. In: Litwin E, organizadora. Educação a distância – temas para o debate de uma nova agenda educativa. Porto Alegre, RS: Artmed, 2001;73–92.
8. Ramal AC. Educação na cibercultura – hipertextualidade, leitura, escrita e aprendizagem. Porto Alegre, RS: Artmed, 2002;121–126.
9. Medelez Ortega E, Burgun A, Le Duff F, Le Beux P. Collaborative environment for clinical reasoning and distance learning sessions. Medical Informatics Laboratory, Medical School of Rennes, France. Int J Med Inform 2003;70:345–351.
10. Mehlecke QTC, Tarouco LMR. Ambientes de suporte para educação a distância: a mediação para aprendizagem cooperativa. Centro Interdisciplinar de Novas Tecnologias na Educação Cinted-UFRGS 2003;1(1). [Acessado em: 16/9/2006]. Disponível em: http://www.cinted.ufrgs.br/renote/fev2003
11. American College of Radiology – ACR. Breast Imaging Reporting And Data System – BI-RADS. 4th ed. Guidance chapter. [Acessado em: 16/9/2006]. Disponível em: http://www.acr.org
12. Instituto Nacional de Câncer – INCA. Classificação dos tumores malignos (TNM). [Acessado em: 14/9/2006]. Disponível em: http://www.inca.gov.br/tratamento/tnm
13. Curso "Linfonodo sentinela, prevenção, diagnóstico precoce e biópsia – nova técnica de abordagem do câncer de mama". [Acessado em: 14/9/2006]. Disponível em: http://ead.compartilhar.com.br
14. Hurst J. A university accredited renal nursing course delivered by distance learning. EDTNA ERCA J 2003;29:188–191.
15. Johnson HA. Overview of geriatric distance education for academic courses and continuing education. Gerontol Geriatr Educ 2004;24:9–22.
16. Dodds JM, Laraia BA, Carbone ET. Development of a master's in public health nutrition degree program using distance education. J Am Diet Assoc 2003;103:602–607.
17. Fiúza PJ, Martins AR. Conceitos, características e importância da motivação no acompanhamento ao aluno distante. UFSC/PPGEP/LED. [Acessado em: 12/9/2006]. Disponível em: http://fgsnet.nova.edu/cread2/pdf/Fiuza.pdf
18. Azevedo W. Tecnologia em favor da educação. [Acessado em: 14/9/2006]. Disponível em: http://www.aquifolium.com.br/educacional/artigos/entwork.html
19. Azevedo W. Capacitação de recursos humanos para educação a distância. [Acessado em: 14/9/2006]. Disponível em: http://www.abdl.org.br/article/view/164/1/90
20. Kent JS, Jaroslaw PG, Dean LS, Powers P. An online survey of chiropractors opinions of continuing education. Chiropr Osteopat 2005;13:22.
21. Steil AV, Pillon AE, Kern VM. Atitudes com relação à educação a distância em uma universidade. Psicol estud [online] 2005;10:253–262. [Acessado em: 14/9/2006]. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-73722005000200012