Innovative Program
Providing Asthma Education to Targeted Populations:
Online Designing Help Tools for Teachers

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Introduction

Asthma is one of the more frequent of chronic diseases in Canada, affecting more than 10% of the population. The consequences of this disease are numerous and the human and socio-economic costs that result from this are enormous. Despite numerous efforts to develop practical guides based on data and evidence, there are still gaps to be filled in as it pertains to the evaluation and treatment of asthma.

Two Canada wide experiments (Blais et al, 2001; Conseil du Médicament du Québec, 2003) dealing with thousands of asthmatic people have shown that an adequate control over asthma is obtained with less than 50% of the people, though people still considered, as well as the health professionals that treated them, that their asthma was under control. The insufficient mastery of asthma has dire consequences on absenteeism at the work place and is responsible for a high rate of emergency room visits or doctor appointments, hospitalizations and specialist consultations. This data shows the importance to intervene with the Canadian population by proposing health education programs adapted to the needs of the citizens. This is done on the level of prevention, therapeutic help as well as promoting health. Some studies (Lemière et al., 2004; Boulet et al, 2004) have shown that with a better understanding of the disease and its optimal treatment, health professionals as well as those suffering from the disease can greatly improve their mastery and control over asthma. Improving the treatment of asthma is among the priorities of organizations such as Health Canada and the Quebec Medication Council.

Taking into account that more and more Quebecers who suffer from asthma use the Internet to learn more about their disease and that French information about asthma is retrained, scattered and often outdated, the project aims for the development of a program for prevention, aftercare services and the promotion of health to improve the well being and the quality of life of those who have asthma and sustaining educational interventions on this disease.

In this report, we will first describe the innovative program providing asthma education. We will then briefly present the two design environments that have permitted both the professors and the practitioners to develop the learning resources by using an active pedagogy.

1. The Program for Health Promotion, Aftercare Services and Asthma Prevention

In the program for health promotion, aftercare services and asthma prevention, more than 60 information and training capsules were created in the form of learning resources. These resources will be innovative, rich in interactivity and also rich in multimedia content. Here are some examples of the elements of content that have been developed for each clientele category:

- For asthmatic people (between 12 and 40 years old) and for their family: 25 multimedia information and training capsules that deal with the different aspects linked to this disease such as: asthma and its symptoms, diagnosis and the criteria for mastering asthma, education and a plan for action in case of exacerbations, the use of inhalers, controlling your environment, the proper use of medication, the importance of care and sticking to your treatment, etc.;
- For educators and the personnel of personal care services: 10 multimedia capsules on the factors that trigger asthma and the control of the environment, the measures to take in case of an asthma attack, the signs for alarm that should be looked for, etc.;
- For health professionals (doctors, nurses, personal care attendants from youth centers for asthmatic people, CLSC, GMF, etc.): 10 multimedia capsules that will support their approach and their intervention for their clientele, including the improvement of taking charge of asthma and the patient care, improving the capacity of making decisions, applying strategies to have a better approach for the treatment of asthma, etc.;
- For the public at large (over 12 years old): 15 multimedia capsules and interactive games to sensitize the public to the problems of asthma and its effects, including: Recognizing the potential signs of asthma (interactive diagnostic test); Becoming familiar with the allergens and irritants that can potentially trigger asthma; Different types of precautions to take in order to improve the well-being of asthmatic people that are part of our entourage; Beliefs, myths and the realities concerning asthma and its treatment, etc.
- For the aboriginal communities: Adapting the language and visual aspects of the 35 multimedia capsules produced for the patients, their family and the public at large, to sensitize them to the problems caused by asthma and their effects.

In order to support the creation and the mediatization of these resources, in the form of interactive multimedia learning objects, the designers and asthma medical specialists supported by a pedagogical team, have used a generic platform for designing online learning objects, Personn@lisa (www.savie.ca/campusvirtuel).

Six online educational games have also been developed (single or multiplayer), aiming for a better understanding of asthma as well as the development of healthy behaviours and the use of proper medication. The games are specifically aimed at the public at large, in general, for asthmatics and their families. The development of the content has relied on the generic educational game shells from the Educational Games Central (http://egc.savie.ca).

2. The Design Environments of the Learning Resources

Two design environments have been made accessible for practitioners and teachers to design and develop the learning resources and the games. Let us examine them briefly.

2.1 Personn@lisa

Personn@lisa is a platform that allows indexing and making available all the necessary resources to attain the learning objectives and the development of specific skills. The platform is easily accessible, no matter where you are from geographically and at any time if you have access to a computer and its multimedia accessories as well as having an internet connection. The platform supports many different modes for training (synchronous, asynchronous and mixed), many pedagogical strategies (i.e. structured, personalized) and pedagogical methods (i.e. case studies, modular approach, project approach, problem resolution).

In order to ensure the personalization of learning, the following principles (Sauvé, 2004; Sauvé & Wright, sous presse) should be taken into account in the online learning environment of Personn@lisa:
- consider the personal experiences of the learner,
- respect learning styles and foster the application of newly acquired concepts,
- take into account the aptitudes, attitudes, and specific needs of the adult learner,
- apply the learning and management strategies appropriate to the learning context,
- provide the learner with the opportunity to engage with the content,
- provide exercises, practice, examples, and quality feedback to the learners,
- foster continuous progress and follow-ups to ascertain transfer: learning cannot be consolidated in one session,
- offer different means to learn one concept or learning module,
- offer constant support and frequent interaction with support mechanisms,
- offer relevant information and up to date information applicable to the work or corresponding interests of the learner,
- offer easily accessible education, convenient for the learner in both time and place, in synchronous and asynchronous modes,
- Ensure that conditions allow for an enjoyable and effective learning experience.

Developed by the Center for expertise and research for lifelong learning (SAVIE), Personn@lisa offers three interfaces that sustain the principal functions of online learning.

Design Interface

The design interface (Figure 1) is reserved for professors, teachers and pedagogical professionals that desire to create online learning content and a personalised and adapted approach for each student. Each training session is constructed from learning objects that are grouped together in a virtual warehouse and in training workshops in real time which are supported by synchronous communication tools (audio and video). The interface allows for the creation of training units, courses or programs constructed from learning objects[1] (static or dynamic) and also content pages. These objects and pages are grouped according to the pedagogical approach with the help of a content organizer within a learning interface that is accessible to students and also in a coaching interface that is accessible to the teacher/tutor. For these contents and according to the interface, different work and communication tools are also offered. Let us briefly examine the design components.
- The learning objects: Different kinds of help are offered for the planning and scriptwriting of learning objects as well as some pedagogical shells for developing objects (such as case studies, problem resolution, situational exercises, written presentations, multimedia presentations, exams, diagnostic tests, self-correcting exercises, quizzes, etc.) are proposed to the design team or the teacher (see figure 1). Created as help tools for designing, the pedagogical team can use them as they are or adapt them to their needs. To have more flexibility in the designing of the objects, the pedagogical team can also design these objects with the use of content pages that offer all possible kinds of combinations to design a specific learning object.
- The learning tools: Different methods for the creation of learning or help tools are also offered, including the creation of a professional portfolio, the development of a questionnaire to analyze needs, the creation of a repository of the skills associated with the course, the choice of questionnaires to establish the learning profiles of the students, the development of statement grids, etc.
- A virtual directory that groups together all of the created objects and learning tools through the help of the design interface and the communication and work tools that are accessible to the different design teams. This

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[1] The learning objects are constituted of numeric training "granules" of limited time (between 15 and 30 minutes), re-usable and adaptable according to the different educational objectives or environments. They are complete in themselves and are about a particular piece of knowledge. In short, they aim for the acquisition of an element of knowledge and they can be re-used in their initial form or adapted to answer to the specific needs of the learners.

directory allows the integration of any digital learning object, free of any royalties or for those that have been authorized, into a course.
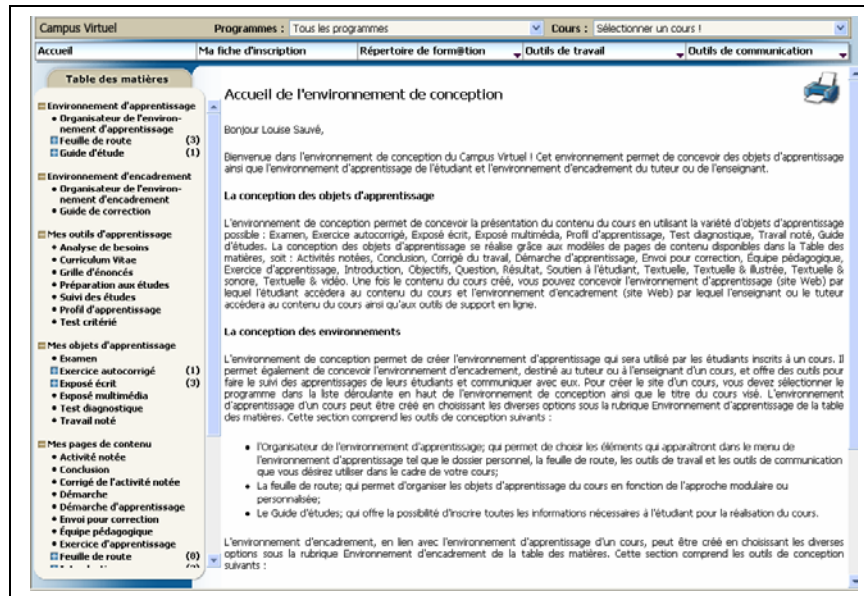
Figure 1. The design interface of Personn@lisa

Learning Interface

The learning interface is generated from the design interface and the choices made by the teacher. Accessible to students, this interface allows the student to: create their professional portfolio (recognition of acquired experiential knowledge and prior formal training), to create a list of their skills and analyzing their training needs in order to identify the skills they must acquire. The interface permits the user to identify their learning characteristics, including the way they process information, their preferences in relation to the different modes and conditions for learning, their motivation to learn in different contexts, etc. These bits of personal information given by each student activate the analysis filters of Personn@lisa which then proposes a type of training or a scenario that is adapted to the needs and to the learning preferences of the student. To elaborate the learning interface, three design tools are made accessible to the teacher:

- The Organizer of the learning interface allows for the choice of the objects and tools that will appear in the learning interface menu of the course, including: the welcome page for the course, the learning portfolio, the pathway or roadmap of the training that regroups the learning objects, the pages, and the work and communication tools.
- Le Pathway Generator (road map) makes it possible to organize the pages and the learning objects of a course in function with one or more pedagogical strategies; for example, a modular approach or a personalized approach. The teacher can generate as many pathways as he wishes.
- The Study Guide regroups all the information (pedagogical and administrative) that is necessary for the student for the completion of the course; for example, the course objectives, the pedagogical team, the learning process, the pedagogical materials, learning support, the modes for evaluation, etc.

Support Interface

The support interface (support for learning) is generated from the design interface. It offers all the work and communication tools necessary for the tutors or teachers so that they can support their students during their online learning. It also proposes help tools for perseverance and correction tools for the learning exercises, whether or not they are graded. The support interface is elaborated with the help of three tools:

- The Organizer of the support interface allows for the choice of the objects and tools that will appear in the support interface menu, including: the welcome page for the course, the learning portfolios of the students

which contain the chosen pathways for each student and the work to be graded, the correction tools that regroups the correction guide and the bank of commentaries linked to the correction of the work and exams from the course as well as the self and continuous units of training in order to be sure that the training from the teacher or tutor in their role as an instructor, facilitator, technical assistant and content manager for the students is adequate.

- The Correction Guide regroups all of the activities for a unit of training or for a course with all of the corrections and distribution of grades thus easing the notational work.
- The tools for helping with perseverance allow the teacher to select from a directory of tools the contents that favour the development of: strategies for self-regulation, studying and learning, communicational skills, editorial skills and the technological skills required to attain the objectives of a module, course or unit of training.

2.2 Online generic game shells

SAVIE's Online Educational Games Central (EGC) was designed as a virtual meeting-place for those interested in using games for educational purposes. It has been especially developed to reach community development workers, in-house company trainers, teachers (elementary school, high school, college and university) and educational professionals wishing to create and exchange educational games adapted to their needs. Teachers and trainers often have to choose between either using what available games there are, as they are, or create new games from scratch. Educational Games Central stands apart from other Web sites because of its computerized "game shells" concept that provides a simple solution for teachers and trainers who don't need to be programmers or even Internet buffs. Six different game shells are offered: Snakes & Ladders, Concentration or Memory, Trivia, Tic Tac Toe, Parcheesi or the Mother Goose Game. The games that flow from these can be played in teams of 2 to 4 players favouring cooperation and teamwork for learning. The educational games are accessible through the Internet without any downloading.

Known for its flexibility and its simplicity, the computerized generic game shell, is defined as follows: "an online structure that generates learning activities involving content, a conflict or competition between two or more participants, a set of rules regulating the movement of players and the criteria for starting the game or how the game ends by declaring a winner. This structure can easily be adapted for a wide range of pedagogical content and objectives." (Sauvé, 2005; Sauvé & Chamberland, 2006) Most of the existing games can become a generic game shell which in turn can serve a great many pedagogical needs. Starting from the same shell, we can create many new games with compatible contents for our different audiences and types of training. Each computerized generic game shell offers eight forms (Identification, Rules, Directions, Game board, Learning activities, Feedback, Pedagogical materials, Evaluation) which are simple to fill out or modify at any moment as well as contextual help. The teacher can also visualize the results of their creation at any time with the use of the Visualization button of the game or simply deleting the game if it has become obsolete by pressing the Delete button of the game.

A learning management tool is added to these computerized generic shells. This allows the teacher to be able to check at any time the knowledge or acquired knowledge or the knowledge to be developed by a student, a group of students or the whole of the groups and this for each game the teacher has created. A simple and friendly tool, it generates in real time the results obtained by the teachers as they interact with a given game. It is a diagnostic and validation tool for learning; this tool is a major asset for a teacher that wants to follow the progress of the knowledge acquisition of their students. The tool also provides for the teachers socio-demographic statistics of their groups.

Conclusion

Drawing upon the expertise of physicians specializing in asthma as well as the therapeutic and prevention aftercare services for asthma, the health promotion program conforms to the very latest scientific data and offers many advantages.

For patients and their family: remote access for all regions in Quebec to learning resources of great quality that were developed by health professionals that will facilitate learning important notions about self-care and the taking charge their disease.

For the Aboriginal communities: remote access to learning resources of great quality with culturally adapted contents that were developed by health professionals. These resources will help the communities learn important notions about self-care concerning the disease in question.

For health professionals, educators and health providers for asthma: remote access to learning resources that promote an innovative and active approach allowing the familiarization with the recommendations made by experts to improve decision making capacities and better applying strategies to be able to better take charge of asthma and the care for patients. Having little time for training, health professionals could discover great benefits within our program: a decrease in time and space constraints by permitting the transfer of knowledge at any hour of the day whether at home or at the hospital. The success of the implementation of this diffusion model on this clientele will facilitate its exportation and application to other health problems.

For the general society: better understanding of the problems caused by asthma, the importance of the environmental factors (triggering factors such as irritants or allergens) and the different types of precautions to take to improve the well-being of asthmatic people and the quality of life of their entourage. This is done to improve the respiratory health of Quebecers and Canadians and to optimize care with a possible reduction in healthcare costs.

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