SMART CITIZENS, a Virtual Course for Training Tutors in Flexible Learning

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ABSTRACT: *On-line tutoring is a prerequisite for an effective deployment of flexible learning schemes. While many resources are available for educating and training tutors involved either in traditional or distance education, only a limited number of resources are available to sensitize and provide tutors with the necessary know-how for supporting students involved in flexible learning. Flexible learning is a hybrid modality where on-campus and remote learning activities are mixed up freely be the students. Such a learning modality is emerging in traditional academic institutions in which the tutors are usually PhD students for whom supporting students is not the main mission. As a consequence, a well-focused and motivating introduction to flexible learning pedagogy has to be offered. The idea of SMART CITIZENS was to embed creative and entertaining activities in the learning process. In its present status, SMART CITIZENS is a hybrid virtual course: it can be taken on-campus, in an optimal, synchronous, blended learning scheme, or as a distance module in an asynchronous mode. The scenario relies on a set of simulations: virtual students learn scientific topics or real life issues, such as problems of antibiotic resistance or animal and human cloning, solve problems, answer questions and comment on the material being learned. The tutors analyze the information provided by the virtual students and must generate the most appropriate feedback. Individual feedbacks are compared and mini-polls are conducted to vote for the best feedback given to the students. The goal of the tutor training process is to discuss key concepts in tutoring. This is achieved through a debriefing procedure in which all feedbacks given by the tutors to the students are analyzed and discussed. The paper will present the basic features of SMART CITIZENS and the evaluation results of its deployment at the Swiss Federal Institute of Technology in Lausanne (EPFL).*

1   INTRODUCTION

Learning is often segmented into various modalities, such as face-to-face, online or distance learning. An ideal learning system should however integrate several such pedagogical modalities, empowering the user to choose what fits them best and thus implementing a truly learner-driven model rather than a system-driven model. Flexible learning that promotes both individual and group activities requires more than appropriate content: the educational offering must include adequate student support systems allowing various levels of interactions. In addition, to be efficient, learning must be based on a competency acquisition system, and learning is better when it is not separated from other aspects of living.

We have been working extensively to develop new methodologies and tools for flexible learning, to promote new and innovative delivery strategies, with the overall objective to develop effective self-directed learning courses, and to build tools allowing the production of effective learning resources.

The purpose of this paper is to present SMART CITIZENS, the implementation of a new and innovative learning solution implemented as a virtual course and deployed in face-to-face group sessions.

2 OBJECTIVES OF SMART CITIZENS

On-line tutoring is an essential feature for any effective deployment of flexible learning schemes. Flexible learning, a hybrid modality where on-campus and distance learning are mixed freely by students, is a promising approach, emerging in several traditional academic institutions. In such institutions, tutors are seldom professionals. Instead tutorship is usually carried out by graduate students or fellows whose main objective is research and not necessarily teaching assistance to undergraduate students. It is therefore imperative to offer such tutors an effective, concise and focused introduction to flexible learning pedagogy. Motivation is an important factor in on-line learning programs. Finally, it is only in practice that beginning tutors can acquire the skills needed to facilitate on-line learning and to engage and motivate learners in on-line settings. A fundamental requirement for SMART CITIZENS resources was therefore the development of a support with the following features:

- A model enabling an active and constructive role for future tutors, here defined as tutor learners;
- Learning activities engaging the tutor learner in virtual tutoring situations (simulations) rather than merely in knowledge acquisition activities;
- Learning tasks encouraging communication and interaction, both between fellow tutor learners and with the course instructors;
- Content resources that are visually attractive and motivating;
- Representations of authentic and real-life settings rather than dry pedagogical contents.

3 SMART CITIZENS INTERFACE

SMART CITIZENS is an animated pedagogical tool for communication between tutor learners and the instructor. The fundamental idea of SMART CITIZENS was to embed creative and entertaining activities in the learning process. The scenario relies on a set of simulations: virtual students learn scientific topics or real life issues, such as problems of antibiotic resistance or animal and human cloning, solve problems, answer questions and comment on the material being learned. The tutors analyze the information provided by the virtual students and must generate the most appropriate feedback. Individual feedbacks are compared and mini-polls are conducted to vote for the best feedback given to the students. The goal of the tutor training process is to discuss key concepts in tutoring. This is achieved through a debriefing procedure in which all feedbacks given by the tutors to the students are analyzed and discussed with the instructor.

SMART CITIZENS user interface includes several dialog boxes:

- A text box that displays the problem or the question being discussed;
- A graphics box that displays pictures or exercises that are related to the topic at hand;
- A text box for coaching the virtual students regarding issues related to the scientific content;
- A text box for typing the tutor learner input;
- A graphical display of poll results;
- A debriefing display.

4 SMART CITIZENS WORKFLOW

After a brief introduction (static Web pages) in which the learning objectives and the rules of the game are presented, the tutor learners access the actual virtual course content, which is illustrated in our example by the problem of animal cloning (the famous Dolly sheep) and related human cloning issues.

Step 1: **Learning phase:** Since tutor learners are not necessarily knowledgeable about the scientific content, they are first asked to complete the exercises as though they were the actual (virtual) students. (Figure 1). The objective is to ensure that each tutor learner:

- understands key scientific concepts underlying cloning;
- can correctly answer questions that will be asked by virtual students.

Step 2: **Simulation phase:** virtual students carry out the same exercise and interpret the results. Tutor learners process students' questions (Figure 2).

Step 3: **Evaluation phase**: tutor learners vote for the best answer to a virtual student (Figure 3).

Step 4: **Debriefing phase**: for each scientific issue (here, the recognition of chromosomes), the virtual students' answers (there are 6 students) are displayed on the screen. Tutors have to answer specifically to each virtual student. Comments of the tutor learners are analyzed through a debriefing

procedure, in which all feedbacks given by the tutors to the virtual students are compared after the vote, analyzed and discussed with the instructor.

Step 5: **Consolidation phase**: The procedure is repeated using this and other pedagogical approaches or tools, globally covering a number of issues that are both specific to the scientific contents of the course that is being taught to the virtual students as well as general issues important for quality tutoring.

5   SMART CITIZENS TUTORING CONCERNS

The course focuses on a variety of tutoring concerns, ranging from behavior problems to practical questions of successful tutoring, such as:

- Discovering the individual character of the different virtual students;
- Assessing the basic knowledge of the virtual students;
- Introducing the main tasks that must be performed by the tutor (modulator, organizer, contact partner, content manager, monitor of the learning progress);
- Handling E-mail communication;
- Studying various learning strategies;
- Training non-interventionism in the virtual students learning activities;
- Handling technical problems associated with on-line learning;
- Working with teams;
- Managing forums and chats communication.

6   SMART CITIZENS FOLLOW-UP

SMART CITIZENS is part of a running project called "MENTORS". The major aim of this running project is to build an innovative support system for flexible learning (Gillet et al. 2003), focusing on various aspects of social learning and teaching (Sire et al. 2003). As such, SMART CITIZENS is not a final product, but an experimental, evolving framework. The challenge was to make use of tutors in training to change and adjust project plans, requirements, and strategies. SMART CITIZENS has been tested on several occasions with tutors at the Swiss Federal Institute of Technology in Lausanne. The opportunity to experiment the system with real tutors, to discuss its weaknesses and listen to user needs and suggestions has led to a number of improvements of SMART CITIZENS. In its current implementation, the system is associated with a high level of tutor learners' satisfaction.

7   CONCLUSIONS

With the development of new technologies, one might envision a not-so-distant future where virtual learning environments may supplement or replace traditional classroom teaching on a large scale. Virtual learning environments offer diverse capabilities and services that are all related to the degree of interactivity that can be achieved. More often than not, virtual courses are asynchronous, and neither require nor allow direct communication between teachers and students. This lack of human, face-to-face interactions has raised a lot of criticism against virtual learning environments. SMART CITIZENS provides tools in the form of a Web-based synchronous software application that allows and encourages instructors and tutor learners to interact in friendly and entertaining face-to-face learning activities.

SMART CITIZENS is a problem-based learning solution. As such, SMART CITIZENS:

- encourages tutor learners to construct their own representation of knowledge and information;
- emphasizes the importance of interaction and socializing among students in the learning process.

The learning framework is naturally and deeply integrated in real life, facilitating the interlocking of work and learning. Learning contents originates in real work situations, and learners take part in real tasks, which then become the main source of knowledge.

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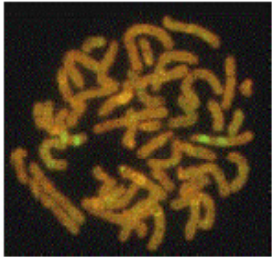
FIGURES

Figure 1 – A tutor learner answer provided during the scientific content learning phase (step 1).

Activity No. 2

Meet the students

This is Heidi's answer to the question "What is this?":

It is probably wrong, but I guess that the picture represents perhaps chromosomes, but I have hesitated with worms for a long time. I am not quite sure... but if this picture represents worms, I perfectly know helminths. Yet, if it's chromosomes, I know less about it. I am very sorry if it's wrong...
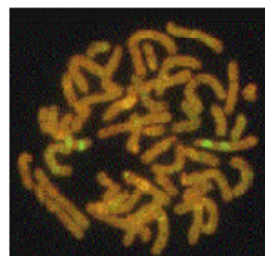
This answer is sent to you. You have received the mail. What is your answer to Heidi?

Your answer:

> Very nice Heidi. You are fully right.
> If I may understand your hesitation, perhaps you have
> to find the ways to feel more confident.
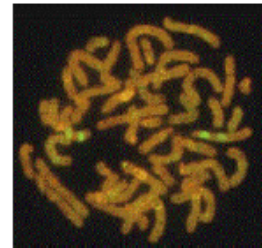> I will help you accordingly.

Submit

Figure 2 – A tutor learner answer to a virtual student during the practical simulation phase (step 2).

Activity No. 2

This is Heidi's answer to the question "What is this?"

It is probably wrong, but I guess that the picture represents perhaps chromosomes, but I have hesitated with worms for a long time. I am not quite sure… but if this picture represents worms, I perfectly know helminths. Yet, if it's chromosomes, I know less about it. I am very sorry if it's wrong…

Among the tutors' answers to Heidi, vote for the most appropriate.

Very nice Heidi. You are right. If I may understand your hesitation, perhaps you have to find the ways to feel more confident. I will help you accordingly.

I understand your hesitation, but this indeed chromosomes

You are right.

Why are you so sorry? This is chromosomes…

Correct.

You are right.

Figure 3 – All the answers form the tutor learners to a virtual student are displayed for a vote (step 3).