

# Teaching Technical Terminology and Practical English Skills using the SNOWBALLS<sup>®</sup> e-Learning Platform

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## ABSTRACT

This paper introduces the SNOWBALLS<sup>®</sup> e-learning platform developed by the Center for Innovation in Engineering Education at the University of Tokyo. Primarily developed for language learning, ensuring learner motivation is one of the biggest challenges. Through collaborative the development with students we developed a game-style learning environment with various motivational and interactive elements.

## Keywords

e-learning, second language learning, student motivation, online game, platform development.

## 1. INTRODUCTION

With the increasing globalization of society as a whole and scientific research in specific, the Japanese government and the University of Tokyo (UT) have set ambitious goals for international exchange and the number of lectures given in English. To achieve these goals, we have to support students in learning a mutual language—whether that is English or Japanese—as well as in learning to see problems from different perspectives and to understand different cultural backgrounds.

Students at the University of Tokyo are generally good at English grammar, reading and writing, but their technical vocabulary and conversation skills are lagging. This especially becomes an issue now that an increasing number of lectures are taught in English, and students are encouraged to join international conferences and do internships abroad. As Figure 1 shows, there are already various programs within the UT that focus on improving English communication skills, but there was no specific program for teaching technical English terminology. To fill this gap, we started to develop an web-based e-learning system called SNOWBALLS<sup>®</sup> in October 2009.

SNOWBALLS, which stands for “Self Navigation Web Based Literacy Learning System”, was primarily aimed at teaching third year undergraduate students basic technical English vocabulary [1,2]. However, the platform’s potential was recognized quickly

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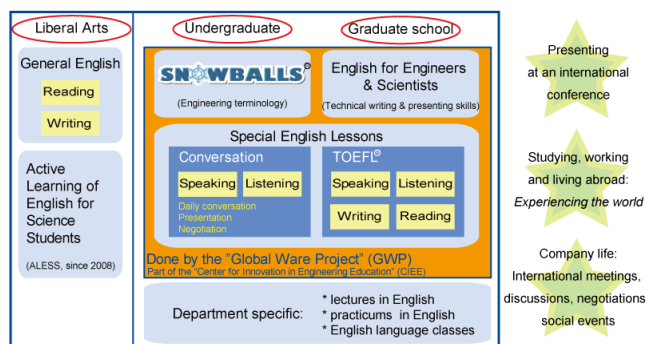


Figure 1. English education engineering students receive at the University of Tokyo.

and current plans include teaching Japanese to international students as well as training faculty and staff through SNOWBALLS. Several departments have also shown interest in using SNOWBALLS as a practicing and testing environment within their regular courses.

This paper will outline the capabilities of the SNOWBALLS e-learning platform and explain the underlying design considerations.

## 2. MAIN BENEFITS AND CHALLENGES OF E-LEARNING IN LANGUAGE EDUCATION

### 2.1 Benefits

E-learning solutions are easily scalable to large numbers of students without the necessity of a large teaching and support staff. Since e-learning is on-demand learning, students can study wherever and whenever they want. In addition, students can go quickly over parts of the curriculum they are already familiar with, while they can take more time for parts they personally find difficult. With a great variety in students’ entry levels and in their specific needs, offering educational materials through e-learning is efficient for both teaching staff and students.

### 2.2 Challenges

Creating a comprehensive set of learning materials that students can still work through in a reasonable time span is a big challenge. First of all, the independent learning style is

something many students are not familiar with and it requires a lot of self-discipline. An additional problem is that second language learning, and especially vocabulary building, is typically boring and since much of the acquired knowledge cannot be put to practice immediately, it is hard to see one's progress. Therefore, to increase student motivation, SNOWBALLS is set up as a game with several opportunities for student-student interaction.

### 3. THE SNOWBALLS® E-LEARNING PLATFORM

#### 3.1 SNOWBALLS in Brief

Figure 2 shows the main screen of SNOWBALLS®, with one's avatar on the left and the four main parts: Study, Battle, Shop and Forum. These parts will be discussed in detail in the remainder of this section.

SNOWBALLS® is set up as a game, where students can gain points through games and quizzes about the teaching materials. In addition, one can gain points if others appreciate one's comments or answers to user-questions in the forum. The points can be used to buy clothes or haircuts for one's avatar in the game. The number of points or the appearance of one's avatar provides direct feedback on one's progress, while the use of the avatar introduces a level of anonymity that helps to take away the fear of socially unacceptable under- or over-performance.



Figure 2. Main window of SNOWBALLS with the 4 areas: Study, Battle, Shop, and Forum.

#### 3.2 Studying and Feedback

Students start out with a plain avatar and zero "snowballs" (i.e., points). Students should start studying texts (Figure 3) and answering practice questions and finally exams at the end of each chapter (Figure 4) in order to get snowballs.

At the bottom of each textbook page students can fill out a self-evaluation of their comprehension. Together with other measures, such as the time spent studying each text and an overview of correct and false quiz answers, this information is provided as feedback to the student (Figure 5).



Figure 3. Examples of a textbook section.



Figure 4. Examples of a practice quiz question (left) and a time trial exam (right).



Figure 5. Example of feedback to students: self-evaluation overview (left) and rate of correct answers (right).

#### 3.3 Gaming and Rewards

The individual feedback provided to the student may help to increase motivation, as it directly displays the student's progress. To increase the awareness of one's progress, and to provide a more interactive challenge, we decided to give students the possibility to battle each other in a one minute time trial quiz. Figure 6 shows how students can enter a virtual room and meet their opponent through the internet. Then they start answering questions as best as they can, and after one minute the winner — who receives 10 snowballs— is announced. After long discussions with students in our development team, we decided not to deduct snowballs from the loser's account, because this could easily discourage participation.

For additional motivation we added avatars to SNOWBALLS which students can dress up according to their own taste. However, what clothes one can buy in the shop depends on the number of snowballs one acquired, and typically more fashionable or unique clothes will require more snowballs. Figure 7 shows an impression of the shop and the avatars in SNOWBALLS. Avatars are visible to other students at several occasions, such as in battles, in the forum and in specially organized fashion shows. Therefore, having an interestingly dressed avatar provides a socially acceptable way to display one's English skills.



Figure 6. Impression of the "Battle" game where 2 students challenge each other in a time trial.



Figure 7. Example of items available in the shop and various avatars of students before and after studying.

### 3.4 Student-Student Interaction

The online battle game is one clear example of student-student interaction in SNOWBALLS. We believe it is important for students to know they are not alone, but they can still study together and challenge, help, and motivate one another.

Another feature providing the opportunity for student-student interaction is the forum (Figure 8). Students can write messages freely and they can answer each other's questions. To promote the use of the forum, we award one snowball to the writer of a comment if another student "applauds" for its quality.

## 4. CONCLUSION

In close cooperation with students, we developed a new web-based e-learning platform called SNOWBALLS. The problem of student motivation played a central role in the development, which is the reason why we finally decided to adopt several game and student-student interaction elements. SNOWBALLS is still

under development and currently contents are still scarce. We continue to work together with students to develop new teaching materials and improve and expand the SNOWBALLS platform itself.



Figure 8. Forum entry.

## 5. ACKNOWLEDGMENTS

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