

Developing e-Learning Content to Raise Global Awareness in a Seminar Style Course

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Abstract – Students created content for an e-learning system in two seminar style courses. In one course Japanese students created e-learning content for teaching technical English vocabulary, while in the other course international students analyzed what materials should be developed to help them start their life and studies in this foreign country. Both courses focused on raising global awareness and understanding of international differences, which is reflected in the resulting e-learning modules. By putting students in a central position, we make sure that both the content and style of the courseware we create will be useful and appealing to the target audience. At the same time, it helps the students to hone their creativity, presentation, and leadership skills. In this paper, we walk through the courses and show the benefits of this approach and the lessons we learned from these courses. Some of the main conclusions are that having a mix of students from different years and backgrounds is very effective to create discussions that broaden everybody’s views, and that this can help faculty to find out what knowledge students feel they miss and how students like to be taught. This, in turn, will lead to more to-the-point and more useful courseware.

Index Terms - creating courseware, e-learning, globalization, intercultural competence, internationalization

INTRODUCTION

In this paper, we introduce our approach to two seminar style courses, which both have the double objective of creating e-learning content for internationalization, and increasing students’ global awareness. Both courses are open to 3rd and 4th year undergraduate students as well as to graduate students from all engineering departments. Course A targets

Japanese students, while course B is aimed at international students.

In both seminars, the students develop courseware that will be used as content for the SNOWBALLS[®] e-learning platform, which is currently being developed at the School of Engineering. We will not discuss our e-learning platform in detail here, but provide a short description in the following section to sketch the background of our courses. We note that the teaching materials in e-learning are typically highly modular, and can therefore easily be created within the time limit of a seminar style course. However, most of the practices discussed in this paper will be applicable to developing courseware in general.

To frame the discussion of the courses, we will start with a brief explanation of the importance of English literacy for technical communication at our university and how we plan to use e-learning, as well as the importance of active student involvement. Then we will describe both courses in detail, and highlight the most important commonalities and differences. One of the main points of both courses is that we involve students in creating their own courseware. We will therefore pay special attention to the benefits of such practice, the challenges we faced, and lessons learned over the semester.

BACKGROUND

1. The SNOWBALLS project

One of the two objectives of the courses we discuss in this paper is to create content for our e-learning platform called “SNOWBALLS”, which is an acronym for “Self Navigation Web-Based Literacy Learning System”. SNOWBALLS was conceived in 2009 as one project within a larger effort of the Japanese Ministry of Education, Culture, Sports, Science and Technology

(MEXT) and the University of Tokyo (UT) to boost the internationalization of academia in Japan.

To attract more students from overseas, and to prepare Japanese students better for the rapidly globalizing society we live in, the UT plans to increase the number of lectures taught in English up to 70% by the year 2020. Apart from that, there are several initiatives to promote studying abroad, joining international conferences, and providing more opportunities for interaction between Japanese and international students and staff on the campus. To maximize the effectiveness of all these efforts, professional communication skills in English are very much needed.

Not only is it important that all students have a sufficient command of English, but for international students it would also be helpful to be able to communicate in Japanese and know about Japanese culture and customs as well. The UT has been offering general English and Japanese language courses, but it was found that students often lacked the specific engineering vocabulary required to follow courses, to do practical assignments, and to discuss about their research.

We created the SNOWBALLS e-learning platform in the first place to teach technical English vocabulary to Japanese students. Soon it was decided that the scope should be expanded to teaching international students technical Japanese, supporting teaching faculty in preparing their lectures in English, and helping office staff to communicate better with students and researchers from overseas.

Learning vocabulary is an important, but unfortunately generally boring aspect of learning a language, and little rewarding on the short term. We therefore decided to involve students in the process of developing an e-learning platform that is easy to use and offers various forms of interactivity, feedback, and motivation to keep on learning. Details about the SNOWBALLS e-learning platform itself are discussed in [1, 2].

II. Student involvement

There are two main reasons why we have the format of student-led seminar style courses. The first reason is that we feel the student perspective is often overlooked in (research) universities, while a focus on students' needs is essential to ensure effective education. By involving students in the process of deciding topics and creating educational materials, we believe that the end result will prove to be more effective. Fox et al. [3] also reported on the positive effects of student involvement in the creation of e-learning resources, although their approach (a project carried out by a team of 1 student, 1 learning technologist, and 2 academic staff) is somewhat different from the for-credit seminar style course we present here.

The other reason is that active and peer learning have shown positive effects on students' results [4, 5] and the seminar style in particular is suitable to teach students "general skills" such as critical thinking, communication & presentation skills, taking initiative and leadership, and dealing with cultural and language differences. Topping [6] defines peer learning as "*the acquisition of knowledge and skill through active helping and supporting among status equals or matched companions*" and differentiates between peer tutoring (PT) and cooperative learning (CL). As will become clear from the remainder of this paper, we apply both PT and CL in our courses. PT is most clear in course A, where students that took the same course the previous semester were hired as teaching assistants (TAs). CL is apparent in both courses, since the students take the lead and have to discuss and decide together how to proceed, with the final (common) goal of creating meaningful and appealing e-learning materials.

OVERVIEW OF THE COURSES

Both course A and B are seminar style courses where students create courseware modules to be used within the SNOWBALLS e-learning platform. The main characteristics are:

Course Style

- Seminar style course (14 weeks \times 100min.)
- Open to all 3rd and 4th year undergraduate students, as well as graduate students from all engineering departments (elective course)
- Students take the lead
- Brainstorming and discussing in class
- Students review and comment on each other's work
- Collaboration in small groups
- Homework: writing or revising courseware based on the class discussions

Course Content

- Creating courseware for e-learning
- Focus on English/Japanese literacy
- Raising awareness of global issues and international differences
- Learning to gather and organize ideas and information
- Learning to look from different perspectives
- Learning to present ideas concisely and clearly

In these courses the students essentially become teachers, thinking about what to teach, how to teach it, and how to motivate their fellow students. We believe it is very important to give the students such a central role in creating courseware, because they know best what topics and presentation styles are likely to match the target audience' interest. Especially for e-learning

applications, it is important to stay up to date and to be aware of the newest technologies and trends to make sure the system will be used as intended. Particularly engineering students are very helpful to achieve this.

A large part of both courses consists of brainstorming, gathering and organizing information, and thinking about the scope and presentation of the module being developed. We also bring up issues such as the credibility of sources, objectivity, ethics, fairness, copyright, and the university's restrictions on commercial speech.

COURSE A IN DETAIL

Course A is a continuation of the seminar style course that lead to the development of the SNOWBALLS[®] e-learning platform, which was originally conceived to teach Japanese undergraduate engineering students technical English vocabulary. In previous semesters, this course focused on brainstorming about what features an effective e-learning system should have and creating the platform itself. The current students in course A now create content introducing technical vocabulary as well as background information and texts to show the use of the new vocabulary in context.

I. Course objectives

On the highest level, the educational objective of this course is to “nurture global leaders”. Several more direct and practical objectives can be derived from this. The first is to make students look at several engineering issues from different perspectives, including the learner/teacher perspectives, the science/socio-political perspectives, and various international perspectives. A second objective is to teach the students to take initiative, and to show them that they can help shaping their own world, which is quite different from the traditional Confucian teaching culture where the infallible teacher is lecturing and students are passively listening. Adding to this, through researching and creating courseware for teaching technical English vocabulary, the students will acquire this knowledge for themselves as well.

An additional objective of this course was to create new content for our e-learning system. We can find out the most important vocabulary gaps to focus on from the discussions with and among students about what topics they find difficult to discuss in English, or with what subjects they struggle when taught in English.

II. Students

Course A is aimed at Japanese students. We decided to hire a few students from the previous semester's course

as teaching assistants, to join the group in the discussions and to co-develop new courseware. In total 7 students took part in course A in 2010: 1 undergraduate in Mechano-Informatics, 1 master student and 2 undergraduates in Mechanical Engineering, and 1 undergraduate each from Precision Engineering, Systems Innovation, and Materials Engineering.

III. Course advancement

In the first lesson, we let the students try the SNOWBALLS e-learning system, to familiarize them with the environment they were going to make content for. This showed them the possibilities as well as the limitations of the system. To motivate the students and to inspire them to create useful content, we kept on spending a little time every class using the e-learning system in the following weeks. At the same time this helped us to find bugs, shortcomings, and inconveniences in the platform, and to evaluate how well the system meets the user's needs.

As first homework, the students listed 5 general engineering topics that they think we should teach English vocabulary for, as well as 5 topics specific to their own field of study. In the next lessons, we discussed and chose 1 topic from each student's list that we found most appropriate. We then asked the students to brainstorm about keywords relating to those topics and to think about where they could find the background information and how they could find the proper translation of words in context.

After this initial phase, most of the class time was spent on students presenting their work and discussing with the whole group about the problems they faced or improvements that could be made. As homework they wrote new texts, made new quiz questions, or revised these based on the discussions and feedback they got in class.

Ultimately, the e-learning modules created by the students were included in SNOWBALLS.

IV. Results

In the summer semester, the students wrote e-learning content on Names of materials, Linear algebra (matrix-vector operations), Robotics, Names of tools, and Statistics. In the winter semester one of the first discussions led to the conclusion that all students should know about environmental issues, as this is a popular conversation topic in society, has many relations with several fields of engineering, and it is good to raise awareness of these issues among the prospected leaders of tomorrow. The issues that the students picked up more

specifically were pollution and climate change, the world energy problem, and life cycle assessment.

We found that the students had some trouble finding topics and vocabulary that are academically relevant, while still general enough to be useful to all engineering students. It especially proved to be difficult to find the appropriate scope when writing texts. Some students went into great depth finding jargon that only specialists are likely to use, while others stuck to a very limited number of terms where more terms or concepts could easily be found to complete the module. For us, the teachers, this was a dilemma as well. How long can a text be? How many new words can we introduce at a time? Should all the text be in English, should it be fully bilingual, or should it be mainly English, with some explanation or notes in Japanese?

Although there are no definitive answers here, and different students may prefer different styles, we think the discussion with students has greatly helped us to get an image of the pros and cons of several choices we have to make considering the length and style of the text and questions to be created for our e-learning system.

When the students had to make quiz questions to go with their texts, they showed a lot of ingenuity, and a great variety in question types and difficulty resulted. Since the SNOWBALLS platform is set up as a game, where points can be gained for quizzes, time trials, and interactive user-to-user games, there were several limitations on the type of questions we could ask. Open questions with multiple correct answers (even alternative spellings) for instance, are hard to implement in the current system. Also having elaborate questions (for instance containing long audio fragments) may be unsuitable for the time trials. Through discussing everyone's homework with the group and through testing preliminary implementations in the e-learning platform we realized what would work in practice and motivate students using the e-learning system, and what would be impractical or frustrating.

As the course progressed, students were able to see the teacher's perspective and discussed about important topics as how to make sure their texts are interesting and motivating enough so that students using the e-learning system will actually want to read them. They also gathered their information from various sources including scientific textbooks, online resources, and popular media, and showed that they were able to integrate these different views into comprehensive e-learning modules. They also showed a growing awareness of other fields of study and international perspectives, which was particularly apparent in the winter semester because the choice of the topics. By the end of the semester the students—and especially those hired as teaching assistants—strongly identified with the

SNOWBALLS e-learning project as a whole. Considering these results, we believe that we were successful in achieving the course objectives.

COURSE B IN DETAIL

Course B was established to develop e-learning courseware for international students coming to the UT for their studies. Its main difference from course A is that we focused on the first exploratory phase to find out what courseware international students actually need. We wanted to inventory what information about life in Japan and getting settled at the University of Tokyo campus in particular is readily available, and what kind of information or vocabulary should be taught through the SNOWBALLS e-learning system. Students with different backgrounds brought their viewpoints, problems, and ideas to class for discussion, and together they compiled a knowledgebase of cultural differences and practical information.

I. Course objectives

Like in course A, we want the students to learn to take initiative and to show them that their input, experiences, and knowledge can be valuable. By sharing experiences in a multinational group of students, everyone will become aware of cultural differences around the world, and learn to respect these differences, especially since all students find themselves in a similar situation here when studying abroad. Students can teach each other in the lessons, and useful teaching or reference materials are created by documenting the information shared in class.

The class also helps the students to get familiar with life and customs in Japan and on the campus. By making the students actively search for information about the research and other campus facilities of the UT, they do not only gain the information itself, but they also learn how to effectively search for such information, even when no English language versions are readily available.

As for the objective of increasing content for the SNOWBALLS e-learning platform, we first focused at mapping the information and knowledge international students need and which questions they have. In the second half, we then tried to find out what information is already sufficiently available, and which gaps should be filled. This will form the basis for future development of e-learning courseware for international students.

II. Students & teachers

12 international students from 5 different (Asian) countries and 8 different engineering disciplines took

part in the first session of the course. 5 of them were Master course students and 7 were Doctor course students. 4 students arrived in Japan at the beginning of that semester, and 4 had been in Japan for less than one year.

The class was conducted by two teachers, of which one has experience in helping foreign students getting settled in Japan because of a previous function as a Japanese language teacher, and the other experienced these very problems by himself several years ago when coming to study at the University of Tokyo as a European.

III. Course advancement

In the first lesson, we asked all students to briefly introduce themselves and include how long they had been in Japan and how well they speak Japanese, as this often proves helpful in finding one's way around. Then we split the 12 students into 4 groups of 3, based on how long they had been in Japan and on which of the UT's campuses they live. Each group then thought of several questions about life or study in Japan, about problems they experienced, and about useful information that they could share with the other groups. They wrote this down as homework, and we gathered the questions and ideas to discuss them with the whole group in the next lesson. In that discussion, most of the questions could be answered by the other students.

In the next few lessons, quite some time was spent on brainstorming about keywords describing the challenges that the students faced. Together we organized these keywords in a mind map and students searched information on these topics, such as useful internet websites. Based on this newly found information we detailed the mind map of keywords and finally we discussed and chose 4 promising topics to work out in more detail. The students could choose which topic they wanted to focus on, and we regrouped into 4 new groups of 3 students each.

It was becoming clear that there was a wealth of general information about life in Japan available online. The group therefore proposed to focus more on the UT-specific information, such as on-campus facilities and services. Each of the 4 focus groups collected information through the internet, through on-site interviews, by collecting information leaflets, etcetera. Of course, every group had to file a report about their findings, and had to share the main information in class for discussion.

In order to see what knowledge or information is actually lacking and could be taught through SNOWBALLS, we searched for ways to further organize the wealth of information the students gathered. This had the additional benefit that the information became more accessible for reference.

IV. Results

Already in the first lesson transportation appeared to be an important issue. The newly arrived students exchanged ideas about the best ways to commute between their homes and their laboratories, which metro lines to take, where to transfer, etcetera, and they introduced each other to several online public transport maps and route planners. Meanwhile the students who lived here longer discussed about how to get a bicycle and how to arrange for insurance and registration with the police and the campus authority. Other important topics were how to find accommodation and how to make friends with Japanese people.

The brainstorming sessions and homework finally resulted in a mind map containing more than 300 unique keywords, ordered in 10 main clusters: Japanese language, Study, Travel & Transportation, Accommodation, Leisure, Communication, Shops, Health, Money, and Food. When discussing which subjects were most suitable for further investigation, Japanese language, Study, Travel & Transportation, and Leisure were chosen. We discouraged "Shops and Accommodation" because these would easily interfere with the university's restrictions on commercial speech.

With the on-campus exploration, groups visited the following places:

Japanese language group

- University wide Japanese language classes
- School of Engineering Japanese language classes
- Local government Japanese language classes

Study group

- Campus bookstore
- Library

Travel & Transportation group

- Machines to apply for student discounts on commuter passes and train tickets
- Travel center (for booking conference trips)
- Office for registering a bicycle

Leisure group

- Sport facilities
- (Historical) sights on campus
- University museum

In many cases, it proved that much information was not very well accessible for foreigners, as often only the most general information is available in English, if any at all. The manuals and explanations that the groups compiled will be a useful starting point for many students and hopefully form a basis for providing more multilingual information through the official channels.

The discussions in class showed interesting differences in viewpoints. For instance the Chinese students had

little trouble with learning the kanji characters (used both in Japanese and Chinese), which are the main difficulty for most other students learning Japanese. On the other hand, Chinese students want to have language courses specifically focusing on listening and speaking practice.

Another example is how the question “How can I become friends with Japanese people?” lead to a discussion of what is considered friendship in different cultures, since someone was surprised that most Japanese people here will not invite you to their house.

To make the collected information easier accessible, students suggested to make a classification into three stages: the “survival” stage (the first month), the “living” stage (up to 1 year), and the “enjoying” stage (after 1 year). By color coding the topics and distinguishing the three stages by different saturation levels, a visual classification could easily be made.

Students filled out a short questionnaire at the end of the course. When asked what they liked most about the course, most students mentioned the interactivity (discussions, giving presentations, ability to raise questions about anything). Additionally, most of the students wrote the course proved to be very informative, and had helped them to find their way in Japanese life. We therefore believe that the course was successful in raising awareness of cultural differences and that students learned how to effectively acquire and share information.

In the questionnaire, “Japanese language” and “campus/everyday life support” were regarded the most important topics for further development.

We concluded that most information and links to websites that were collected would be very useful as an online knowledgebase. Most general information about life or campus facilities is subject to change and a link to a place where one can find the information is often sufficient.

Japanese language learning would be the most promising topic for e-learning applications, because this is typically something that should be learned through studying and practice. General language courses are plentiful, both online and face-to-face on campus, but they mostly do not go into the specific vocabulary needed to start a conversation with lab mates about one’s research or to understand a presentation in a lab meeting. Such interaction is not only essential to make progress in research, it will also help to build relationships and make new friends.

DISCUSSION

Course A was a continuation of a course held in the previous semesters, although the focus was on creating e-learning *content*, rather than the e-learning *platform*.

The course therefore had a quite clear goal, although there were plenty discussions and opportunities for student initiative to decide on the most appropriate style to present the courseware.

Course B started in the winter semester and was exploratory in nature. The goal was to investigate what necessary information for international students at the UT is lacking, and especially which topics could be taught through e-learning. In the following semesters the topic will have to be narrowed down, which probably also leads to a slightly more fixed course style.

I. Student interaction

The small number of students in course A made it possible to review and discuss each student’s work in more detail. In course B, discussions with the whole group were often somewhat slow, and we decided to split the students in groups of 3. We had one representative of each group summarize the discussion for the whole class, which proved to be an effective way to share information and wrap-up the discussions at the same time.

In both courses students teach each other and are each other’s peers. In course A we also see that the older students—who generally took the course before and were now hired as teaching assistants—are creating a natural layer between the teachers and the other students, where they can mingle freely in all discussions. They are valuable for relaying important knowledge, experiences, and ideas they picked up in the previous semester(s). In course B there was a similar development, since the students who had been living in Japan somewhat longer proved to have much advice for the newcomers, while the newcomers asked many important questions that seem obvious and are easily overlooked by those living in a foreign country for a longer time.

Interactive courses like these offer great insight in what problems or questions the students actually experience, and the answers to these are a rich source for additional courseware that one might not have thought of before.

For instance, in course A students submitted their homework by e-mail, which led to a short workshop on the common errors in their emails and typical phrases and formats they could use. Their following submission e-mails improved greatly. Similarly, in course B we soon noticed that many students had interesting experiences or information to share, so we encouraged the students to make a short presentation of about 5-10min for the class any time during the semester. Since even after discussion the students remained somewhat uncertain about what topics and style were appropriate, the teachers prepared 2 presentations to illustrate the idea, after which many good student presentations followed.

II. International differences

When we decided to start course B separate from course A, we expected that international students would mostly need information and Japanese language skills for their daily lives, while Japanese students mostly need to learn technical vocabulary to be able to read and write research papers and to give presentations at conferences. This proved to be the case indeed, although we found several areas of overlap. International students also want to learn technical Japanese so they can follow specific courses, join lab meetings, or find employment at a Japanese company. Japanese students may need some daily life English as well, when they travel abroad for conferences, or join their international lab mates or friends in after school activities.

During the classes, we also observed an interesting difference in the behavior of students. The international students seemed to be more comfortable with the freedom they got in this course and took more initiative. They made several suggestions to the teachers even in the first few lessons, such as to go out on the campus and interview people to obtain information. The Japanese students often needed some more motivation or instruction from the teachers to feel confident that they actually had the capacity to *create* courseware.

It seemed like the international students enjoyed standing in the teacher's shoes because they could share their knowledge and experiences, while the Japanese students were more aware of the responsibilities they suddenly got when creating courseware. We believe this difference may be due to the way the Japanese students have been educated, and the way Japanese society as a whole is organized, with a strong sense of respect for one's superiors and predecessors. On the other hand, it could be a mere artifact of the probable fact that only those students who feel confident and take much initiative end up studying abroad.

III. Faculty perspective

Involving students in creating courseware has several benefits for the faculty. First, students provide a different viewpoint and raise unexpected questions. Maybe especially with e-learning, the needs and interests of users are changing quickly. Students come up with many ideas to incorporate new concepts or technologies to enrich the learning experience and to motivate the learners. The input of students is also very valuable for choosing appropriate topics to create content about and for deciding the level of difficulty of the teaching materials.

It is difficult to tell whether involving students in the creation of courseware is an effective way to speed up the

process when only limited faculty are available. Although the preparation of classes, discussions, reviewing and providing feedback take time, it is very likely that a system developed by faculty only would not nearly match the students' needs as well as a system developed cooperatively. Since we are teaching the students several valuable skills at the same time, we believe these courses are efficient.

In a student-led seminar style course, it is important for the teacher to know his place and to encourage students to take the initiative. This can be difficult at first, but there are several techniques to achieve lively and fruitful discussions [5].

One of the biggest challenges is to manage time efficiently. It is often difficult to judge whether a brainstorming session or a discussion is going too far off-topic, or whether it is actually moving into a promising new direction. Giving students more initiative requires the teachers to be more flexible, but at some points intervention is necessary to make sure everyone gets the big picture and to ensure coming to clear conclusions and results. We therefore made extra time to discuss specific feedback, problems, or questions of individual students after class.

CONCLUSION

Students are enthusiastic and enjoy the challenge of shaping their own education. They are pushed to think, investigate, and discuss about global issues and learn to understand different (cultural) viewpoints. At the same time, the students offer input that is valuable for the faculty to create an e-learning platform and content that are well adjusted to the needs and interests of the target group.

Learning a second language is an important first step towards internationalization. For university students it is indispensable to develop strong English or Japanese language skills both for daily life in the globalized world, and to effectively do research and communicate about one's ideas and findings. Apart from creating e-learning content to help other, future students develop these skills, the students creating this content in the courses we discussed also gain this knowledge for themselves.

In both courses we discussed the mix of junior and senior students and the different backgrounds of students (be it in their field of study or in their nationality) proved effective in raising the right questions and creating a broader picture. This is especially important for the current phase of the development of the SNOWBALLS e-learning platform, where we focus on creating content for engineering students in general, and not yet on department-specific topics.

The students showed great development throughout the course. Whereas they were somewhat hesitating in the beginning or overwhelmed by the freedom they got in choosing their own topic, content, and style, they quickly got comfortable with working in the group and discussed problems and ideas freely. The result is a number of new and useful e-learning modules for the SNOWBALLS platform developed by the University of Tokyo.

OUTLOOK

We plan to merge the two classes from the next semester on, and to make couples of Japanese and international students. The main reason for this decision is that we learned from course A that writing courseware in English is still difficult for Japanese students, and they require much correction and feedback from the teachers. At the same time, the international students of course B found it sometimes challenging to gather information in English, because websites, pamphlets, forms, etc. are often only available in Japanese.

A basic level of Japanese will be required, and students will be matched based on their foreign language capabilities (best with worst). We believe this will lead to an interesting exchange of ideas as well as language skills, leading to bilingual courseware. This also connects to the desire of the international students to have more opportunities to become friends with Japanese students. The students at the UT are typically very studious and on top of that most Japanese are not very confident speaking English. By putting both courses together, Japanese and international students will have a common goal and will have to cooperate and use any language in any way to reach the common goal.

Since we were able to identify an overlap in the topics both subgroups found necessary to learn about, we believe merging the groups will enhance both the efficiency of creating content for SNOWBALLS and the learning experience for the students.

We do however believe that the separate courses A and B have been effective for the first phases of brainstorming and finding out the needs of both specific subgroups. Now this knowledge has been acquired, and we can see the common grounds, a new phase starts with more focus on effectively producing courseware. The objectives of the course will not change greatly, but we may put more emphasis on international collaboration and ways to gather reliable information and distill this to courseware that is both instructional and motivating.

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