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Enhancing Collaborative Language Learning in Engineering Education with Team Portfolio

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Key words: *E-portfolio, collaborative language learning, team portfolio,*

Abstract:

This paper describes the development and implementation of learning and teaching experiment to encourage the use of e-portfolio in language learning courses and also the integration of English courses with professional studies of engineering students. This is an ongoing project which is annually developed and improved based on student feedback the focus being on collaborative and communicative language learning. New learning environments, such as learning platforms, e.g. R5 Generation, Skype and MS Messenger, are experimented with.

1 Introduction

In the surrounding society there are a lot of changes which directly reflect on working life. The better the professional education meets the needs of working life, the better employability for graduates there will be. Today's working life requires comprehensive language and communication skills from graduates and this challenges both the language policy and schools in their educational tasks. In working life more interactive students with better oral presentation skills, e.g. in multicultural situations with speakers of many languages are needed. Thus more cross-cultural understanding is crucial and cultural aspects are more and more placed into focus. In Finland several studies on the language needs of working life indicate that a variety of languages are needed to study during the education and presently it seems that too few are studied. The studies also indicate that more writing is required, e.g. email, writing for the web etc. Language is a tool for thinking and acting in multifield international cooperation and integration of languages into professional studies is sensible and a motivating factor for the students worthwhile implementing although the language teachers in vocational education are thus facing a multitude of new challenges. The other side of the coin is the limited financial resources resulting in less contact classes for the students and more self-study, which requires meaningful assignments for the self-study.

Language teaching is defined according to the decree of Finnish universities of applied sciences in the following way:" The task of language teaching at universities of applied sciences is to grant the students readiness to operate and communicate in expert tasks in the international working life. Language teaching should emphasize the students' readiness to develop cross-cultural interactive and personal professional skills." Here it is clearly indicated that the needs and demands of working life are number one as to language teaching at the universities of applied sciences.

Common European Framework is used as a theoretical frame for development of language teaching in Finland. However, there are no recommended methods how to reach the objectives. All curricula are linked to CEF (for further information on the implementation of the CEF in Finland and several European countries, please refer to CEF Leonardo project at www.cefpro.org to define the guidelines of vocational language education more in detail). The assessment of linguistic, sociolinguistic, pragmatic, cultural, existential competencies should also be developed to be more versatile, creative and rewarding for the students.

2 Background to the present study

To take the Bachelor's degree in engineering, students at the Jyväskylä University of Applied Sciences have mainly two compulsory English courses and depending on their previous studies some students may have a special refreshing course. One of these compulsory courses is general in nature and the content is the same for all the students. The other compulsory course which the engineering students have is a professional English course, the content of which partly depends on the line of specialisation. (e.g. ICT English, Paper Machine Technology English etc.)

The study on enhancing engineering students´ language learning was initiated in 2002 with the suggestion of the Head of the School of IT of Jyväskylä University of Applied Sciences that the English teachers of the Language Centre should integrate the language courses more closely into the professional studies of the IT engineering students. Thus, the motivation of the students towards mandatory language studies was expected to improve and the actual study of the professional substance to become easier with students reading the same texts in two courses: the professional as well as the English classes. The texts discussed in classes were to be of the professional field of the students, e.g. software engineering, data network technology.

As technology advances and the requirements of the working life change the courses should give relevant and usable skills to students for their future and therefore new ideas of learning and teaching must be exploited as much as possible. Furthermore, financial resources allocated for different courses are becoming more and more limited; the time possible to employ for one single course is becoming shorter and shorter. Then on the other hand, to gain most of the course the students need to get practice as much as possible. To achieve the best possible results a portfolio course seemed to meet the criteria because portfolio is a way to complete a course and a tool for assessment.

The study started with a group of data network technology students as a 3-ECTS-credit professional English course with 45 participating students, the number of contact lessons being 20. Additionally, the students selected courses in professional subjects and prepared two oral presentations to be presented in English as well as two written assignments from the professional courses. The form of assessment was decided to be a portfolio and all the assignments were to be gathered in an e-portfolio. Next, the e-portfolio mode was expanded to Business Information Systems students using self-directed mode, the e-portfolio and the learning platform R5Generation as their forum. Then Mechanical Engineering students joined the project and started to do e-portfolios integrating English and their professional studies.

Between 2003 and 2006 the model used was varied slightly based on the more than 200 students´ feedback, contact classes being between 10 and 24. The teachers learnt in the process to explain the purpose and uses of e-portfolio in learning and especially the meaning

of student reflection. The most important new aspect in year 2006-2007 was to boost learning in teams and it has proved to be a most innovative tool for learning.

At the time being, all IT-engineering students (N= 120 students per year) complete their professional English course with a team-e-portfolio integrated into their professional studies; the objective thus being among learning professional English for working life situations the boosting of collaborative learning in small teams. Almost everyone will work with some form of a team on a regular basis also in future; therefore it is important to enhance team working skills while studying. The English course of mechanical engineering students (N = 60 students per year) also employ this team portfolio mode but the idea of their English course is that the students can include both individual assignments and assignments made in teams in their e-portfolios.

3 Portfolio Courses in Engineering Studies

As portfolios are collections of the student's work representing a selection of performance, a mixture of documents and artefacts, they are suitable for integrated courses and can represent in a versatile way the student's skills and knowledge. Furthermore, portfolios are flexible methods to learn and students have an active role in learning and applying their skills and knowledge representing the source for an individual's reflection on his/her language learning efforts and results. This motivates the individual to advance further. In a way, portfolios can be a learning 'passport' containing details on achievements concerning the participant's work, endeavours and advancement in learning foreign languages, regardless of the way: by attending a course, by distance learning, or by self-directed learning. At the same time it can be an internationally comparable tool for identifying the individual's language proficiency in the process of acquiring internationally valid certificates and attestations.

When English teachers started to implement portfolios in the language course and the professional courses of engineering students, the idea of these courses was more or less the following: the students had some contact lessons, they had some written assignments and they were also supposed to give some presentations during their professional courses. Their presentations were assessed both by the language teacher and the 'professional teacher'. In addition to this peer assessment was in use. During the contact lessons students had a lot of oral practices and at the end of the course they had an oral test which was also part of their portfolio assignments.

In all courses the students handed in their portfolios with self-assessment after the course finish and they were then assessed by their teachers. The self-assessment was given a strong emphasis as the English teachers wanted to see how the engineering students could reflect on their own learning – one of the main focuses on this portfolio experiment. The experiences were all in all so positive that it was decided that the e-portfolio combined with face-to-face classes and integrated into the professional subjects of the students would be the mode of teaching professional English also in future.

There were a number of some required tasks of the course which the students included in their working portfolio. All those tasks were shown to the teacher towards the end of the course, and then the students also collected a showcase portfolio at the end of the course. For their showcase portfolio the students selected the assignments which they thought best show their knowledge and skills. They also gave some feedback on their fellow students on their portfolios. In the course there was no written test because all evaluation was based on the

students' portfolio and their output in the contact classes. In addition, the communicative situations and simulations in class were emphasized in the assessment. Thus, as part of their portfolio work and to assess the students' skills in spoken English and pronunciation, a test was organized where a group of students were given a situation where they had an opportunity to show how their oral skills had developed during the course, for example the software engineering students had to negotiate about starting a net café.

Thus the assessment of the portfolio course was based on:

- portfolio work
- self assessment
- peer assessment
- teacher's assessment
- presentations
- oral tasks/tests
- vocabulary test
- active participation

The students were also asked to fill in some questionnaires during the course and to give some feedback on the course to their teacher. Most students handed in their portfolios on time. The majority of students included the tasks they were given as suggestions and only a few of the students took the opportunity to use their 'own' material.

In their self-assessment students quite nicely reflected their own work during the course. Students were also encouraged to evaluate the assignments made by others peer assessment being effective means for encouraging collaborative learning and improving the quality of student learning and empowering learners. Peer and self assessment help the ability to make judgements which is a necessary skill for study and professional life.

In 2006 - 2007, the scenario was slightly modified: the mandatory assignment to answer the teachers´ questionnaire on personal learning results and give feedback on their own success as well as the factors that benefited the success was broadened with new tasks involving team work, i.e. a team-e-portfolio in a group of 4 students instead of 4 – 5 individual portfolios was to be compiled.

4 Team-portfolio Courses at Jyväskylä

The objective of the pilot study was to find out if the mixed e-portfolio model is suitable for more integrated language learning for engineering students. One of the aims was also to hear the students´ voices in feedback and in reflection of their own learning experiences and results as well as their own assessment: students were also asked to grade themselves with a grade from 1-5 (5 being the best in Finland). Surprisingly, the students and the teachers agreed in about 95% of the cases on the grades and the students were very grateful for getting proper written and oral assessment feedback from the teachers instead of a plain grade. One objective was to study if this mode was more work-intensive for the teacher and the student than the traditional test. A language course cannot be totally transformed into electronic form in a learning environment; the students would not accept that but there must be an ideal ratio of contact vs. distant study classes where the student has enough free space to develop his/her skills individually and on the other hand, in social context with other students.

The new modified format with a team-e-portfolio was to give a new dimension to learning: working with other students writing and performing presentations as well as giving feedback to peer students was to boost learning. Students represent their learning outcome in a form of e-portfolio where every team member has an active role in learning and applying their skills and knowledge to gain the best possible *work.* Ownership of one's own learning is important. Team-portfolios provide more meaningful learning together and it is helping peer assessment. The mixed e-portfolio was the model: contact lessons, self-study, creating the learning portfolio in teams. Assessment based on both portfolio work as well as on classroom activities (active participation in lessons valuable = 50-50). Further tasks were also given to encourage creativity: drama used in simulating meeting and negotiation skills; digital story telling etc. All this succeeded very well in digital form. Digital storytelling was also encouraged in the portfolio work; however, it was an optional task and needs to be developed for further adaptation next academic year.

Last term's major target was the exploitation of peer assessment in a more advanced way. The team e-portfolio has proven useful in this aspect. Furthermore, the students' shyness to present their own work to others disappeared in teams: everyone was working harder and participated more than expected. Of course, the further development of the ingrated model is the greatest challenge and with students' constant feedback this is possible. The other huge challenge for engineering education will be the interest from employer side to start using e-portfolio for recruitment purposes as well as getting the professional lectures more involved in the evaluation process of the e-portfolios. The digital format should make this challenge easier for all parties: the portfolios can be distributed and displayed in all necessary fronts.

In future the Schools of IT and Engineering and Technology will integrate language and professional studies more intensely and the professional lecturers are showing more interest in reading the student portfolios. This is a valuable asset for everyone involved in the portfolio projects. The missing link has been active peer assessment since so far the students have been encouraged to send in their assignments into the learning environment and to a fellow student's e-mail. This option is not yet used, even if students were promised extra points. Still, they suffer from strong self-criticism and are not willing to demonstrate their personal e-portfolios. This is one of the teachers´ challenges for the future. Of course, the further development of the integrated model is the greatest challenge and with students´ constant feedback this is possible. There has also been interest from the employer side to start using the e-portfolio for recruitment purposes.

According to all lecturers participating in the portfolio experiment, skills gained with team portfolios are:

- scientific and critical thinking skills
- problem-solving skills
- communication and social skills
- team working skills, group dynamics
- life-long learning skills
- (i.e. enabling/transferable skills)

All these above mentioned skills are highly appreciated in working life.

5 Conclusions and recommendations

The last five years have been a very educative learning process for both students and teachers, even more so for the latter. The instructions on completion of the course, feedback and assessment have improved a great deal since the first pilot project. The students´ feedback has continued being overwhelmingly positive and they still encourage the teachers to go on with the e-portfolio mode. They like the responsibility and the ownership of learning, both features important in future employment lifelong.

An authentic student testimony illustrates the difference the students felt in studying with the team-e-portfolio mode:

This English course was different than any other English courses before in this school. We were talking and got information about our own automation field for e.g. machine vision, industrial robots, PLC-systems and many other things which are close to automation. That is a good thing! I learned a lot of new terms and words which may be useful in the future work. One good practice was to demonstrate the meetings and how to behave in those situations. We need that at work, too!
We held the presentation in Quality Systems course about the quality system of Fortum service. That was the biggest job for me for our portfolio because I knew that company from before. I have worked there for over five years and so it was easy for me to get information about their quality system and they were friendly, helping me on this job. Jani and Tero had a big role on this job too because they checked what Risto and I were writing. They did a very good job! We were doing together some e- tasks at school too during English lessons so we didn't have to do everything at home. The other presentation in Automation Systems we also managed pretty well as a team and we did the report together for the webpages.
Now I think I may use my English in everyday life in general level and I understand much more about professional English. These tasks have helped me to find out information and I realize that I may learn if I use my English skills more. Now my English skills are at a good level which I didn't expect after my first English course.

All in all, the students responded to the portfolio project very well. The lack of a formal written test and the freedom to choose the topics that really interested them have resulted in increased motivation. Instead of test stress and lots of meaningless rote learning, students were very motivated to introduce their work to other students as well in writing as in speech. The students´ creativity has surprised everyone including themselves and the forms the e-portfolio takes are very rich, highlights being some videos with students having to e.g. learn to use completely new software. Also the use of R5 Generation learning platform has been a challenge for both learners and teachers. The students use Skype and MS Messenger in their freetime so communicating with other team members was not a problem. At the first glance many students claim the e-portfolio is demanding and time consuming but on the other hand, the freedom and possibility to choose tasks from a variety of possible assignments has been very rewarding for the students. The most difficult tasks are the ones that they learn most of, said one student after his portfolio course.

The first experiment was a mixed mode of contact classes and e-portfolio. It has been a long way from that - the students' estimated work load, which in the pilot was a challenge, has now become more realistic and thus, more motivating for the students. Compared to previous years, this year some of the professional teachers found excellent integration material, and the big picture has now become clearer to all participants. In their feedback, more than 200 participating students have assessed that most useful and important issues have been

information retrieval skills, use of sources and references but none the less important were their new acquired skills to reflect on their own and their team's learning, write down assessments on their own learning results, problems, development targets and an objective grading of their own work. Also meetings and negotiations as well as some cross-cultural issues and relevant business correspondence were discussed on the course. The students were this year given the option to either write a team portfolio or complete the course with classroom activities and a test at the end. Nobody chose the test after hearing that the portfolio will be completed in teams!

The last five years have shown that giving the students comprehensive and detailed instructions how to do a portfolio course is very important. Especially important is that the aim and purpose of the portfolio course should be clear to all students and also the deadlines should be given at the beginning of the course. In other words, the following should be clear:

- aim and purpose of the course
- what tasks and assignments should be included
- structure and organisation of the course
- reflection and assessment
- appearance of the portfolio

As to the instructor/facilitator, he or she should

- know well the curriculum and contents of courses
- be innovative
- have good organisation skills
- have time
- be willing to take risks
- commit himself/herself to work with students in their portfolio work.

The course now starts with a checklist of tasks the students are expected to master after the completion of the course and in the feedback the teachers were delighted to see that the until now over 200 participating students had ticked most useful and important issues such as information retrieval skills, use of sources and references but none the less important were their new acquired skills to reflect on their own learning, write down assessments on their own learning results, problems, development targets and grade themselves objectively. Individualist and self-directed learners gain from this method, the less self-directed learners, however, still need the support of the teacher more and would prefer the classroom model with more contact classes and less work at home.

It can be warmly recommended that a teacher using e-portfolio first acquires good computing skills and studies some of the plentiful literature on portfolio, e.g. user testimonials. At the Language Centre the experiment was started with one group but with more knowledge on e-learning, portfolios and increased experience the teachers are confident to expand the e-portfolio model for all pro-English groups.

Learning to learn, and moreover, learning to learn in teams is an achievement that benefits the students their whole lives. Lifelong learning is one of the spear heads at the Jyväskylä University of Applied Sciences. The employers are also more satisfied when they hire fresh Bachelors of Engineering with good social skills and a proof of them could be the Team-E-Portfolio that can be shown in a job interview.

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