EXPERIENCES WITH USE OF ACTIVITY BASED TRAINING METHODS IN LANGUAGE TRAINING

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Abstract

Activity Based Training (ABT) environments, which were developed in the Leonardo da Vinci pilot project Mecca (2005-07), are currently used in vocational education and training within mechanical industry in several European countries. The pedagogical practices are based up on the following general principles:

- Specification of a product or a process, which is delivered to the students in the form of an order from an external customer or organization. The order must be completed within a predefined deadline.
- The product or process is divided into subcomponents and produced in an “industrial-like” production flow, in which theoretical training is immediately followed by practical work where the theoretical training is applied.
- Use of multimedia material, modern learning tools and/or interactive mobile learning services that highlight, demonstrate and initiate student discussions by addressing “Do’s” and “Don’ts”.
- Introduction of quality assurance in the training path is obtained by checking if the quality of the subcomponents or sub processes follows the specifications in the order.
- Customer verifies that the quality of the product or process is according to specifications in the order, before product is taken over.

ABT starts by receiving a technical and economical specification of the product (a pyramid in this example). The product constitutes of many small pieces (here: boxes) that is developed one by one, and put together into one product (here: the pyramid). In order to figure out how to construct the product, it is necessary to learn more theory, carry out practical investigations, and provide quality assurance of the components during the production.

During 2010 has the methodology been adapted for use in language training in Norway. This paper is going to outline the pedagogical reasons for the design of the new ABT innovative teaching and learning environment that improve students' learning of Norwegian and English languages. This was been done by using problem-based learning where students in Norway produced information and promotion material (a leaflet, web-site and a video) based up on an order from a university in Romania. The goal is to use the promo material to enhance exchange of Erasmus students from Romania to Norway.

The article will outline the results obtained so far (qualitative and quantitative). The results obtained are based on observations, surveys and interviews of students attending the exemplified project. Our results and methods are generic, whereby they are applicable to European wide training practices. They include results like:

- At the end of a course the students have produced a real physical product or designed a process based up on specifications provided through an external order.
- Students participate in a practical problem-solving process where they must decide in which sequence they are going to produce the components and afterwards assemble them, in order to handle the specifications in the order.
- During this process they develop an understanding for the importance of obtaining both practical and theoretical knowledge.
- Engaged students that use an attractive learning framework.

Our results show that ABT may be used in high schools, vocational education and training, as well as in higher education.
1 WHY THERE IS A NEED FOR NEW LEARNING METHODOLOGY AND ENvironments

After a normal lecture, the teacher is often satisfied because the students seem to react positively towards the curriculum being taught. They even say that they have understood, and they go home happy, eager to try on their own, only to figure out that without sufficient guidance, they are not able to solve the curriculum they have attended a lecture about. This is frustrating, also for the teacher and that is why we started thinking differently about how, where and why we teach. There is no point having lectures where the students are not able to draw from the curriculum what they are supposed to. Our answer has been to build two digital learning laboratories, dividing the students into smaller groups, giving them access to new technology and enabling them to solve varied and differentiated problem based tasks under the guidance of qualified staff, who functions as facilitators more than lecturers.

When we look at the higher education in Norway today, there is one measure that seems to be the medicine towards increasing efficiency, and that is bigger groups, fewer lectures with more curriculum per minute taught and more curriculum per point achieved in the study. This seems like one way to go, the only problem is that it does not work, cause most of the students do not like this kind of learning, and therefore does not learn as much as they should during their years at University or University Colleges. At primary and high schools the trend seems to be the same, at least according to the PISA and PIRLS reports, placing Norwegian students in the bottom according to test scores in subjects of mathematics, science subjects and reading. [1] At HiST, Department of Technology, we have started to move in a different direction, towards smaller groups and more activity based training.

1.1 How to use a digital learning lab

Throughout 2011 the digital learning labs have been used in different ways. There are some general advantages these rooms give contrary to other learning environments.

First of all the digital learning labs give an exciting way of collaborative work. Students group together in five or six with one common table and a Smart Board in front of them. The Smart Board functions as a common point of focus, making the students work together with the problem instead of by themselves. The students function as a group, instead of as single students just working in a group.

Using a Smart Board instead of for example a TV screen strengthens the group feeling, since this gives the students the opportunity to actually move from their seat to point out, solve an example etc. on the board. This makes the group dynamic, gives them a break from the fixed positions and enhances the group’s attention towards effects of team work, increasing the learning effect for each student.

Collaborative work gives good effects according to learning. [2] Through common efforts and thinking together, students are able to solve more difficult tasks in a way that makes the entire group both participate and understand. This also gives the teacher an opportunity to differentiate the problem. The problem presented to the students should always be in such a way that it gives all of the student mass a sense of mastering, but it should also give the more skilled student a possibility to rise, pushing his limits and solve problems that are not necessarily in the curriculum. In this way all the students experience a feeling of mastering the tasks, granting them motivation, maybe the most important ingredient in a student’s everyday school life.

We have used the digital learning labs in different subjects, like mathematics, physics and language training, and off course this also means different approaches when it comes to problems given and methodology used. The easiest way of using the rooms, is simply putting the students in groups,
giving them the same problem as we would have provided them with in an individual tasks. The students respond well to this, they do get a sense of accomplishment. But according to Blatchford (2003): “It should be clear that there is more to group work than sitting students in groups and asking them to work together”. We observe some of these problems. The students often tend to solve the problem by themselves, and then after solving it, beginning to discuss why they have solved it in this way.

This led us into redefining the problems given to the students: «It is important that the task is set up in a way that encourages all members to talk and work together, and does not actually encourage individual working.” Instead of just giving individual problems to be solved in a group, we designed problems that are meant to be solved as a group. Basically these are problems consisting of several small part problems, which in the end can be put together solving the bigger problem or puzzle. This forces the students into taking active part in the process, and enhances the feeling of accomplishment for each student. We observe that students being active in this process learn more, get more motivated and that students motivate, applaud and help each other through the process.

In two of the groups being used for experimentation in 2011, one physics class and one class in language training, we have developed the methodology even further, and implemented Activity Based Training (ABT), from a model developed through the Leonardo da Vinci pilot project MECCA (2005-2007) [5], coordinated by HiST. The model is closely related to modern businesses and how they work. At DEEL Research Unit we are currently researching how to use some of the methodology also in Vocational Training [6].

1.2 Activity Based Training – a short introduction

According to the ABT model there are four basic components to be considered: 1) Specification of a product as an order, 2) applying an ABT methodology to ensure that theoretical training is immediately applied into practice, 3) interactive training utilizing students own Smartphones and 4) extended use of multimedia material to enhance self-paced online education. [7]

Figure 2: A “snake”, showing how the students should work with an ABT problem.

The basic idea is that the students through ABT will get more motivated to also learn theory during the process. Whenever they get to a problem, they will be forced into seeking explanation in theory. This provides good synergies between practice and theory.

In the Autumn of 2011 we wanted to try the methodology in a theory based subject, Language Training. We decided to use four weeks, including one week where the students had a leave, to test the ABT in one class within the subject of commercial theory. The main aim was to improve their motivation for commercial theory, and also for Norwegian in general. The next part of the article will explain the process, and point at different experiences throughout the project.

In the project we developed a new “snake”, showing the process.
1. **External order from a customer**
   The student group got a customer request, delivered from Rumania, for promotional material; a video clip, a leaflet and a web-page, aimed at recruiting Rumanian students to Norway through the Erasmus exchange program.

2. **Introduction**
   The student group was split in half, giving us two commercial bureaus of approximately 30 students each competing for the job. They were given access to the digital learning labs, within the frames of the University College’s time table, the students time table and the other subjects the students attended, and external resources, both technical and human resources, in form of qualified staff. There were at least two subject teachers present in every lesson used for the project during the four weeks it lasted, as well as several others observing, giving advice and collecting data. The subject teacher appointed one group leader in both groups, and then the students took control.

3. **Planning**
   According to the ABT-method, there were some guidelines the students needed to follow. First of all, they had to divide into sub groups to be able to finish all the different tasks. They also appointed one leader in each sub-group to be included in a project management group of four students. The rooms are designed for exactly this kind of work. Easily the group can divide the room into six small rooms, and by drawing the curtains they can include all the smaller groups into a whole. The curtains also lower the sound, both from video clips and discussions, making the lab a good place to work in.

4. **Documentation**
   During the project, the students were given a work pack, consisting of different documents they had to write, different meetings they had to lead and participate in and different deadlines they had to fulfill. This led the students into a state where they needed to learn theory, which were given to them in short lessons led by the subject teacher during the whole period. This was also the case when they were to put all the different products into one before the final presentation via video conference to Rumania. They saw the need for commercial theory, to outline a symbolic, coloristic and theme based promotion, were all the elements corresponded with each other. Some of this curriculum was given to them through lectures, some they found out on their own, but most of it they obtained through discussing actual problems with one of the subject teachers or other students, relating it to their own product.

5. **Technical Fabrication**
   Both groups quickly decided on using Words brochures, World press as web-page and Movie Maker as the editing program for the video clip. One aim of the project was that students should focus on curricula more than technical solutions. The students showed extended knowledge about the technical side, which enhanced the focus on curricula.
6. Customer Assurance
During the project weeks, the bureaus had to contact the customer twice for customer verification.
Before the meetings the groups sent a status report to the customer. The meetings were held via
video conference, forcing the students to explain and outline the problems in a different language
than their mother tongue. They were given the opportunity to put up their products on one Smart
Board whilst the customers were on another. Through discussions they agreed on how they
should progress. The groups took into consideration the customers marks and tried to develop the
products in the direction he wanted.

7. Fabrication
After meeting with the customer the groups worked on implementing his ideas into the products,
gathering the required amount of information, highlighting the important aspects of the commercial
and proofreading everything. This was the hardest part for the students, struggling to keep
motivated, keeping the groups together and finishing a good product to deliver to the customer.
This was also the part of the process were the subject teacher was most involved, directing the
groups in the right direction, and explaining theoretical aspects the students wondered about.

8. Refining
In the last week, we used SRS to figure out which of the products were the best.[8] The last
couple of days, the two groups worked together refining and validating the products as one group.
This was a way of making the whole class a part of the final product, giving them a sense of
ownership to the final product. The group also designed adds were they sought for experts within
the fields of brochure making, web and video, so that the products could be made in a more
professional way after the project was finished. This was a way to ensure the quality of the product
towards the customer.

9. Product delivered to customer
In the work pack, there were specific elements the students had to deliver, including formal
documents like a contract, papers for meetings, minutes, notes and ads. The students delivered
this together with the final products, and had a last meeting with the customer. The products were
approved, and should be directly applicable in promoting HiST towards Rumanian students. This
is a vital part in the ABT methodology, showing the students that what they deliver will in fact be
used outside school, which again increases student motivation.

The final products presented to the customer were approved, and all the involved parts were more
than satisfied with them. Everything is uploaded on the web page that can be viewed from here:

   http://mejn.no/project

2 RESULTS

2.1 Results according to surveys
To obtain quantitative data we did one pre and one post survey, using SRS on a Google docs
schematic. The pre survey was done on four different groups, to get a good average score. The post
survey was done only on the groups that had worked with the ABT training method in the digital
learning labs. Our goal was to see if the motivation increased as a result of the method and extended
access to technology and new learning environments.

The survey contained sixe questions; 1) Age, 2) Gender, 3) Plans for further education, 4) previous
interest for subjects being taught, 5) Which factors influences interest and 6) Which Technological
tools available influences interest. The students should rate each question with a number from 1-5,
were 1 was Low and 5 was High. We will only comment on the last two questions in this article.

The pre survey was performed between 20.09.2011 and 26.09.2011. There were a total of 200 (27
female) students involved, spread on four different classes. In the subject class there were 44 (2
female) students attending the survey. One of these was not following the lectures in Norwegian.

In the pre survey we see that the average scores are consistently high. When it comes to what
influences the interest, we can see that Technological Tools has an average score of 4,2. In the
subject group its even higher, 4,4. When we look at the next question, the average score for Digital
Learning Labs has an average score of 4,0, the same as in the subject class. This is high a score, and
at this point the students had been only once in the labs. One of the survey groups had never. This shows that the anticipation of technology and new learning environments was considerable.

In the post survey, performed 03.11.2011 there were 39 (2 female) students attending the survey in the subject class. The data shows a significant decrease concerning technology and interest. In the post survey the subject class scored 3,3 in the question concerning this, compared to 4,4 before. We see the same decrease in the next question, where Digital Learning Labs score 3,5, compared to 4,0 in the pre survey. We also see that the general interest for technological tools decreases; SmartBoard from 3,6 to 3,4 and SRS from 4,0 to 3,8.

There are several factors that may have influenced the quantitative results. The project period was long, the post survey came close to the end of the project, the students did not use all the technology available, the group may have misunderstood the questions, the group was small, which means that the five students lacking on the post survey has significance. As does the fact that they did not know exactly what a digital lab was on the pre survey. Still, the data do not show what we anticipated, which means that we need to investigate closer, and compare data over several years to see if this is a trend.

2.2 Student observations obtained through qualitative interviews

After the project period we performed a set of interviews. The students volunteered for the interview, and the interviewer made two groups; one with three students and one with two, and interviewed them about their experience with the project.

The interviews lasted about one and a half hours, and was recorded, videotaped and transcribed afterwards. In the transcription students were made anonymous. All quotes are translated into English, and kept as close to the original as possible. In this part we will use the teacher observations to comment on the interviews.

The main focus for the interviewer was threefold; 1) The ABT method, 2) The Digital Learning Labs and 3) The Learning outcome of the project. In the following we will comment on the each of the three focus areas, and illustrate with quotes. Finally we will also comment on a couple of other things the students mentioned.

2.2.1 The ABT-methodology

Generally the interviews show that the students are satisfied with the ABT-methodology. One of the aspects they comment on is the outer motivation this kind of work brings to the subject: "It was ok that it was a real project. It was, it was really a product that we made for, for students in Romania in a way. […]It was not a hundred percent fictive. (agrees). That was sort of cool. (agrees) They also commented on the competition between the bureaus as an aspect of motivation: "It was actually a motivation then, that it was unknown how the other group was then. Tried to be a little bit competition then. Internally. (agrees). It was…"

Maybe the one thing the students were most satisfied with was the refining phase, and the way the final products came out. Some of the students were even surprised that the final product was that good: «I think that the final product, after all the mergers (yes), it was good. (yes) I was surprised actually.» There are several of the students commenting on this, which indicates that the ABT-methodology worked as planned, giving the students a sense of understanding that small parts done well, becomes a good whole in the end.

The students also show an understanding of the process and the value of collaborative work. When the interviewer asked them to compare this method to regular lectures, they reflected on the learning outcome. One of the students claimed that you learn other things as well as the curricula:

   Very good, actually, really. It may happen that you don’t feel that you have learnt a lot, or. But then again, so you learn and gets to know fellow students (agrees), you learn yourselves to find information, say out information, goes then job in teams, if you get into it, off course […]So you learn a lot by failing then, and wonder about it (agrees) and discuss with fellow students.

The interviews match the teacher observations during the period. Student motivation seemed to increase. They worked long hours with the project. Students were positive whenever talking to teachers or other students about working in the digital learning labs, and stated that the ABT methodology made the curriculum more interesting.
But there were also some problems with the methodology. One of the biggest problems was the group size: "[...] large groups may in reality undertake classroom tasks as smaller working groups, such as pairs." [9] Observations and interviews show that the strongest students more often took control and did the work themselves or together with the other strong student(s) in the groups. The students also comments on this, especially towards the work load being put on individuals: "When you are thirty people in a group and the group sees in the beginning that it is thirty people, then it’s, here is potential for a lot of spare time to watch movies, and movies it is…" The students would like smaller groups, and instead work closer together in the refining stage.

Another problem was that the work load on the project management group was big. From each subgroup one student participated in the project management group:

It really demands a lot of administration. Us in the one group that was the four people that kind of was the project management group, the first couple of periods we stayed behind at school for two, three hours every day. To make a project, saw together documents, and the make minutes in each meeting, and then make an agenda, time schedule and, this kind of main, make a kind of chart (agrees) that you could show on the SmartBoard, you may say, that everybody understands…

At the same time the students acknowledge that this group probably learned more than the rest of the student group.

The ABT methodology aims at creating motivation within the individual student, and within the group. One goal of the project was to extend students interest beyond the grade and towards the process and products. Still the grade is important in a student’s life: “Because what is important, I think, I don’t know if it’s quite accurate, but according to my experiences you get ownership, that each person feels that they own a part of this project that makes, if they aren’t here, the project stops”. Another student comments on grades as a motivating factor: “It is a source of power. It is a source that, that, for they who do not have that inner drive of motivation, who knows that, I want to learn, then they at least have that motivation, I want to have a good grade.” This shows that the product and process in this project was not sufficient, even though the students were satisfied about the students not participating getting a fail on the project as a whole.

Overall both students and staff found that the ABT methodology worked well, and helped improve the learning outcome and motivation in the student group.

2.2.2 Digital Learning Labs

In general the students enjoyed working in the Digital Learning Labs. One of the students claimed that it would not be possible to do the project without the Labs: "[...] it is almost impossible. Cause everybody would have to gather around one PC to see have he had done it [...] I think that room did half the project". In general the students liked the infrastructure in the room, being able to easily separate the room into smaller chambers, having a common focus area on the SmartBoard and getting a feeling of working as a group instead of just in a group: “Instead of one person fiddling with a computer. And having everything there, everybody sitting around there (agrees), then everything is there (agrees), doesn’t need, it becomes a more open discussion then, instead of three people sitting in front of a PC and discussing […]"

The students also comment on problems with the rooms. Many of these comments concern hard- and software not present in the rooms. This also resolved in that they did not use all of the technology available; many students instead used their own computers. This is something the teachers also noticed in their observations, but it did not affect the final products.

The students commented on a problem they considered as being more important. During the project period they did not have unlimited access to the labs. This is difficult to mend, but it should be possible to plan better, so that they at least know when they have access or not. One of the students answers to a question on what could be improved: “Some like, have to be certain about that we have access at that time. So that you have more to work with…”.

2.2.3 Learning outcome

The most important thing for subject teachers is learning outcome, and in this project they felt that the ABT methodology actually helped towards this aim. The students agree, and they comment on the fact that teachers combined practical work with theoretical framework during the project period:
And that was magnificent, and I have not really, has not actually thought about the value of, of the project before we in a way came, before we in a way were supposed to have the commercial part also, then I thought like, I know that [...] And I get a lot of stuff, surprisingly (agrees), I do, I have to say.

These comments are the same for all the students in the interviews. They claim that having theoretical lectures during the period was vital, they comment on increased motivation through recognition from practical to theoretical and they felt it necessary to be guided by teachers during the process.

It also increased their sense of learning and motivation that they made what they called "a real product": "And then it was a bit more real considering that, yes it was nerves when you should present it on the first video meeting we had (with the customer, our mark). I was nervous right" They claim that this way of working with "real products" made them sharper.

The students also comment on the fact that this project was close to real work situations as positive.

The first statement from a student in one of the groups shows that they are aware of the learning outcome, which the subject teachers also observed. On a question about how they have experienced the project, he answers:

Well. In the beginning I was a bit surprised about how everything should go, because vi had a lot of goals, thought in the beginning that it would be hard to get everything in our tasks (done), because it’s a big group to be bothered with such a small project. But then when we had started, when we saw how deep we had to go into it, then it actually was pretty good in accordance to the number of students we were. [Agrees] It was a bit more demanding than we thought, everything in the assignment and everything, details that had to be fixed. So it was good learning.

Even so, both students and trainers observe some problems. Like always there are some students that do not participate as they should. One of the students was asked directly if everyone did as they were told from the leader: "Yes (mm), but it was always the same people (agrees). Usually, usually, the one that was taking responsibility in that group, finally he did it, (agrees). Yeah, hmmm…" Several times they get back to this fact; some of the students had a bigger work load than others.

This is also a concern for teachers. All of the students do not complete the entire curriculum. Instead they do parts, and get experts within a small part of the curricula. The students observe the same: “People get like, it becomes one and one that does one and one thing. (agrees). And then it is one that learns about meetings, and one that learns about status reports and then one that learns about contracts and then twenty that doesn’t learn anything. (agrees).” Later in the interview another students says: “But I think so to say, it is like, it is different, different learning outcome for everyone then (agrees). Nobody learns the same actually (agrees).” This is a problem with group work, and not a specific problem with the ABT methodology, but still it is something to consider when revising and designing new ABT projects.

3 CONCLUSION
In conclusion the project was positive. The students were satisfied, same as the teachers. ABT methodology proves to be dynamic, motivating and gives good learning outcome. But there are improvements to be made, and problems to be researched further. We will have to work on teacher control, group sizes, design of tasks, better goal orientation both concerning curricula and technology usage, the time schedule for projects and how to mix this with other subjects being taught. The students should be trained in project management before starting ABT projects.

Despite all, our results show that ABT methodology is applicable for students in language training at all levels, and should be considered a vital substitute to ordinary lectures.

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