

**Report on the situation concerning teaching of Programming  
as well as needs and opportunities in teaching and learning  
programming in the project partner institutes in Europe and in  
Bangladesh**

Codewitz Asia-Link project (BD Asia-Link/10/095-229)

**May 2005**

## TABLE OF CONTENTS

<b>1) INTRODUCTION and brief summary</b>	<b>3</b>
<b>2) EUROPEAN PROJECT PARTNERS VISIT PARTNER INSTITUTES IN BANGLADESH</b>	
2.1. Visit of Mr. Kujansuu from Tampere Polytechnic to Shahjalal University of Science and Technology in Sylhet, Bangladesh 13.-17.3.2005	
2.1.1. Visit programme	5
2.1.2. Description of activities	5
2.1.3. Report on the visit	6
2.2. Visit of Dr. Wladimir Bodrow from University of Applied Sciences Berlin (FHTW Berlin) to Bangladesh University of Engineering and Technology (BUET), Bangladesh 13.-17.3.2005	
2.2.1. Report on the visit	8
<b>3) BANGLADESH PROJECT PARTNERS VISIT PARTNER INSTITUTES IN EUROPE</b>	
3.1. Visit of Dr. Md. Jobair bin Alam from Bangladesh University of Engineering and Technology (BUET), to FHTW Berlin in Germany and to Tampere Polytechnic in Finland	
3.1.1. Visit programme	9
3.1.2. Reports on the visits	
FHTW Berlin	10
Tampere Polytechnic	15
Comparison	18
3.2. Visit of Mr. Mohammed Jahirul Islam from Shahjalal University of Science and Technology (SUST) to FHTW Berlin in Germany and to Tampere Polytechnic in Finland	
3.2.1. Visit programme	19
3.2.2. Description of activities	
Berlin	19
Tampere	20
3.2.3. Reports on the visit	
FHTW Berlin	21
Tampere Polytechnic	23

## 1. INTRODUCTION and brief summary

In the framework of the Codewitz Asia-Link project (BD Asia-Link/10/095-229), brief teacher exchanges were organized between the European and Asian project partners in order to familiarize with the teaching of programming in the partner institution. The aim of these visits was to describe the situation as well as find the similarities and differences there might exist in teaching practically the same subjects. In the following pages are gathered the reports of these visits with the visit programme as well as with the evaluation on similarities, differences and possible improvement proposals.

The persons taking part in the visits and writing the reports were:

- Mr. Esa Kujansuu (Tampere Polytechnic, Finland) to SUST, Sylhet, Bangladesh 13.-17.3.2005
- Dr. Wladimir Bodrow (FHTW Berlin, Germany) to BUET, Dhaka, Bangladesh 13.-17.3.2005
- Dr. Jobair bin Alam (BUET, Bangladesh) to FHTW Berlin and to Tampere Polytechnic 15.-24.4.2005
- Mr. Mohammed Jahirul Islam (SUST, Bangladesh) to FHTW Berlin and to Tampere Polytechnic 16.-24.4.2005

One of the overall notions from the reports is, that the teaching of Programming does not differ significantly, even though the project partner countries are very different. The teaching has great similarities concerning the organization, curriculum and pedagogical sides. Especially the difficulties, which the students encounter in learning Programming proved to be very similar in all countries. Nevertheless, also differences were found, the biggest differences being the following:

- 1) Group sizes are bigger in Bangladesh partner institutes than in European partner institutes in the lessons as well as in the laboratory classes. This causes that a teacher has less time per student. Furthermore, in Bangladesh students might need to share one computer between two students in the laboratory classes, whereas in Europe each student has own computer and is mainly expected to solve the tasks individually. On the other hand, the students in Bangladesh seem to be more active and participant during the lessons than at least in Finland.
- 2) In Bangladesh, the universities might not have fast internet connection nor sufficient amount of computers available for students to work also after the lessons with computers. Especially the difference regarding the fast internet connection between the European and Asian partner institutions is significant. If fast internet connection and access to computers is lacking, it has a direct impact on the possibility to use eLearning materials as part of the courses.
- 3) In the universities of applied science in Europe, practical placement is compulsory for the students. In Bangladesh there are at the moment very few possibilities for practical placement.

- 4) In Europe some teachers for the lessons come from the work life/industry, especially in German partner institute. This guarantees that the skills needed in work life are taught to students.
- 5) In Bangladesh, students are required to write reports even from small programming assignments, which improve the skills of the students, whereas in Finland reports are written only of bigger projects.
- 6) In Finland 'group work' mainly done in pairs, whereas in Bangladesh in groups of 4-5 students as this reflect better the situation of team work needed in the working life.
- 7) In European partner institutions more voluntary courses are offered to students, in Bangladesh this is difficult due to the lack of teachers.

In this context it must be mentioned, that the both European project partner institutions, namely Tampere Polytechnic and FHTW Berlin are Universities of Applied Sciences, which are by their nature more practice-oriented than 'traditional' universities or technical universities in Europe. This might an impact for example on the emphasis on the connections with the industries and with the compulsory practical placement.

In Tampere, 16<sup>th</sup> May 2005  
Tarja Tapio

## **2. EUROPEAN PROJECT PARTNERS VISIT PARTNER INSTITUTES IN BANGLADESH**

### **2.1. Visit of Mr. Kujansuu from Tampere Polytechnic to Shahjalal University of Science and Technology in Sylhet, Bangladesh 13.-17.3.2005**

Written by Mr. Esa Kujansuu

#### 2.1.1. Visit programme

##### **13.3.2005**

17.30 Arrival at Sylhet airport

18.30 Meeting with the technical committee of SUST

##### **14.4.2005**

10.30 Signing of the Project Agreement, Vice Chancellor's office

12.00 Meeting with the technical committee of SUST

13.00 Lunch

14.00 Meeting with the teachers of SUST

16.00 Meeting with the technical committee of SUST

17.00 Break

19.00 Dinner with Vice Chancellor

##### **15.3.2005**

10.00 CMB session

11.00 Lesson attending & discussion with students

13.00 Lunch

14.00 Meeting with the teachers of SUST

16.00 Break

17.00 City tour

##### **16.3.2005**

10.00 Lesson attending & discussion with students

12.00 Financial issues

13.00 Lunch

14.00 Meeting with the technical committee of SUST

16.00 Sightseeing

19.00 Meeting with Vice Chancellor

##### **17.3. 2005**

07.30 Meeting with Jahir

09.15 Flight to Dhaka

#### 2.1.2. Description of activities

During this visit I met several teachers from SUST as well as the key staff members of SUST in Codewitz. SUST has organized their project work in the following way. The Vice Chancellor of SUST is the local project manager. Mr. Mohammed Jahirul Islam is the local coordinator and contact person for the project. He is also the head of the four member Technical committee, which is responsible for executing the project

work in SUST. In addition to these key persons I met also several other teachers and professors in SUST.

#### Day 1

During the first visit day the project Agreement between Tampere Polytechnic (TPU) and SUST was signed. During the first day and if I understood it right during the second as well the students were in strike. Thus the first day I had no possibilities to follow the teaching of SUST. I was discussing with the teachers about their teaching systems and we also concentrated in the project work details with the technical committee. I was also invited to have a dinner with Vice Chancellor of SUST in the evening.

#### Day 2

The students were having lectures today. The strike might still have been going on, but I had the chance to follow the lectures and I learned a lot about the teaching in SUST. To describe it shortly their system is almost exactly as our system in TPU. The biggest difference is larger groups. In SUST there are 60 students in one group while in TPU there are about 35 students in one group.

#### Day 3

During the last day I was finalizing my experiences with the teaching in SUST as well as we were discussing with Mr. Mohammed Jahirul Islam about the project work details. I was also lucky to be able to have a journey around campus area during the afternoon.

As a short summary according to the visit SUST and TPU provide quite equal BSc studies. The biggest differences are in group sizes and with the networking capabilities. The speed of internet connections is very slow and it will put some challenges to our project work. The possibilities of distance education are also quite poor at the moment. But it has been seen all over the world these bandwidths will get better by time and I believe in a couple of years the speed of connections will be enough for full capability virtual learning.

#### 2.1.3. Report on the visit

The differences concerning computer programming studies between Tampere Polytechnic (TPU) and Shahjalal University of Science and Technology (SUST) are presented in this report. The report is based on the visit of Esa Kujansuu in SUST 13.3.-17.3.2005. This report defines the differences in organizational level and in curriculum and as well from pedagogical point of view.

#### **Organisation**

The group size in SUST is around 60 students when in TPU the group size is around 35. This is a remarkable difference. This difference has the most effect when having computer labs. In SUST there are 30 students in one lab group while in TPU there are always less than 20. With one supporting teacher in a lab the support time per one student is obviously less in SUST than it is in TPU. SUST doesn't provide mass lectures with bigger sizes than 60 students.

Teachers have quite similar working circumstances. Including lab and project hours the teachers of SUST have around 20 teaching hours per week plus individual support to the students. TPU teachers have the average around the same. In TPU it is sometimes possible the teachers have even 30 or more lesson hours per week, but fortunately it is always an uncommon situation. In SUST there are no workloads like this.

In SUST there are not as many voluntary courses available as there are in TPU.

### **Curriculum**

The number and the content of the programming study program is quite the same in SUST and TPU. Both institutions offer Bachelor degree and the studies take four years. In the content there is of course some difference in individual courses. For example TPU doesn't provide compiler construction course, but these kind of slight differences are normal between any two institutions.

It is also obvious SUST students have more lesson hours than the students in TPU. For example in Basics of Programming (Structured Programming Language in SUST) there are 2 hours of lectures and 6 hours of lab in SUST. The same figures in TPU are 1 hour lectures and 3 hour lab. This same tendency is in all courses. Thus it can be said the students of SUST get more teaching they get in TPU.

The biggest difference I was able to find is the requirement of practical work placement. TPU requires one year working experience before a student can graduate. With bad work market situation this sometimes causes delays with the graduations of TPU students.

### **Pedagogic**

Concerning the pedagogy I was not able to find large differences. The teaching sessions I was able to follow and the discussions with students and teachers were clearly showing the pedagogical methods are basically the same in our institutions. In TPU we give our teaching still today mostly with traditional lectures and labs just like they make it in SUST. But in TPU we have a long history of testing virtual learning in programming studies. This gives a lot more possibilities to the pedagogic ways of teaching. The slow and expensive internet connections almost totally reject this opportunity in SUST.

In Finland in general the students have broadband connections available in TPU in around 2000 computers. As well the big part of the students of TPU has the broadband connections available at home or especially in student residences. This situation gives the students a choice of taking virtual studies instead of traditional studies in some courses where virtual offering is available. This possibility is according to my experience in SUST impossible at the moment there.

### **Summary**

During the visit I found no significant new ideas except the improvement of technical capabilities of international connections in SUST. Since both institutions share quite similar curriculums and teaching methods I can safely say there is no need for big changes in either institution according to this visit.

In addition to earlier points I could mention one significant difference between SUST and TPU. The atmosphere during the lectures I was following in SUST was very enthusiastic about the subject. The students were asking and taking part during the lesson. In Finland the students are rather passive than eager when the lectures are taken place. This is one of the problems generally in Finnish education.

The improvement of connections in SUST will happen by time and the disadvantages in teaching possibilities caused by this will disappear when technology develops.

## **2.2. Visit of Dr. Wladimir Bodrow from University of Applied Sciences Berlin (FHTW Berlin) to Bangladesh University of Engineering and Technology (BUET), Bangladesh 13.-17.3.2005**

Written by Dr. Wladimir Bodrow

### 2.2.1. Report on the visit

During my visit to Dhaka from 11<sup>th</sup> till 17<sup>th</sup> of March 2005 I got a nice opportunity familiarize me with the lecturing processes at Bangladesh University of Engineering and Technology.

I joined several lectures at the IIST and had a number of discussions with students and lecturers as well as with technical staff.

Professors at the Bangladesh University present their lectures used modern technology – mainly they offer prepared slides and explain the examples working with the table. This materials Students could download from the Internet to be better prepared to follow the lecture. The lecturing take place in good atmosphere: students ask their professor for additional knowledge from the topic of the lecture, they discuss even the practical aspects of the lessons learned. Lecturers present their topics free speaking and concentrate the introduction according the situation on details of the topic.

The lecturing in programming is strong organized and follows the book chosen by lecturer. After presentations some examples from the book lecturer offer additional tasks to students to be solved. That part of lectures students have to master by themselves, without support. For the organizing the lecturing in programming I would like to make following advises:

- The presented examples students have to test immediately during the lecture on their own PCs (the lectures take place in the PC-Lab)
- Very helpful aspect of the teaching especially in programming is to show students which situation could occur if the don't follow the rules. Even to show practically what could happen if one use the wrong reserved words or constructions.
- Even by working alone the lecturer should be in the Lab so he could support the failure of test solutions and provide the best practice rules for programming.

Even following the lectures in programming languages I could recognize a good confidential atmosphere of lectures – students asked lecturer about some aspects of

using different instruments and started very open discussion with him about different topics of lecture.

Working within the project will help all partners to learn from each other and to improve their own lecturing concepts and practice.

### **3. BANGLADESH PROJECT PARTNERS VISIT PARTNER INSTITUTES IN EUROPE**

#### **3.1. Visit of Dr. Md. Jobair bin Alam from Bangladesh University of Engineering and Technology (BUET), to FHTW Berlin in Germany and to Tampere Polytechnic in Finland**

Written by Dr. Md. Jobair bin Alam

##### 3.1.1. Visit programme

###### Saturday 16.4.2005

15:00-21:00 Meeting on financial issues at FHTW

###### Monday 18.4.2005

9:00 Start of the project meeting

10:30 Walk-through the departments of FHTW, incl. Library and Int. Office

11:30 lunch

12:15 Discussion about the main project activities

13:00 Sightseeing in Berlin

17:30 meet with Dr. Bodrow at Sony center, dinner

###### Tuesday 19.4.2005

8:00 Following the lesson

9:00 Discussion with FHTW students

10:00 Discussion about the studies of Programming at FHTW

11:00 Meeting with the vice-president of FHTW

Lunch

12:00-18:00 Following the lessons of Dr. Bodrow (knowledge based systems), possibility to discuss with the students

###### Wednesday 20.4.2005

14:20 arrival to Pirkkala airport

16:50 City tour by minibus with the guide

18:30 Dinner

###### Thursday 21.4.2005

8:40 Picking up from the hotel

9:00– 9:30 Opening

\* Presentation of TAMK and Finnish system of education

9:30 – 10:30 TAMK walk-through with visits in selected departments, incl. Dept. of Electrical engineering and Computer Centre

10:30 – 11:40 Visit at Tampere University of Technology in Hervanta

11:40 – 12:30 lunch at TAMK  
12:30 – 13:30 Discussion with the teachers of Programming, going through the Programming studies at TAMK  
13:30 - 14:00 Possible discussion with the students of Programming and coffee, presentation of partner institutes  
14:00 – about klo 15:00 Discussion about possible exchange programmes  
15:00 – about 17:00 Future project activities, Request of paymet etc.  
Transport to the hotel  
18:40 Picking up from the hotel  
19.00 Dinner at Restaurant Näsineula hosted by the principal of TAMK, Mr. Markku Lahtinen

#### Friday 22.4.2005

9:30 picking up from the hotel by TAMK car  
10:00 – 10:45 Participating in the Programming lecture of Mrs. Paula Hietala  
11:15 – 12:00 Participating in the Programming lecture of Mr. Pekka Pöyry  
12:00 – 12:40 Going through Teacher exchange report and making of Plans  
12:40 – 13:05 lunch at TAMK  
Pause, possibility to attend the Friday prayer at Tampere mosque  
14:30 – 15:30 Visit at TUT Environmental Engineering  
15:30 – about 17:00 Going through the Making of Learning objects, other technical, administrative and financial issues  
17:30 Picking up from the hotel by TAMK car (Esa, Tarja)  
18 - ? "Finnish countryside"; light dinner and possibility to go to sauna

#### Saturday 23.4.2005

Departure of SUST project partners from the hotel at 05.20  
10:00 Meeting with Dr. Alam for financial / administrative issues at TAMK

### 3.1.2. Reports on the visits

#### Report on the Visit to Berlin University of Applied Science (FHTW), Germany

The Berlin University of Applied Science was established in 1990 with an objective of producing professionals of highest quality with industry oriented expertise. Since its establishment, the university has been highly successful in satisfying its goal of delivering graduates having professional skill to match the industrial requirement of Germany and Europe as well. Also, the university has developed an excellent consortium of academicians, professionals, consultants and industrial entrepreneurs to create a dynamic environment conducive for professional development. Currently the university has developed a close relationship with leading industries which include Siemens, Dialmer-Benz, Motorola, Nokia etc.

At present there are 5 faculties in the university which include

- Business I
- Business II
- Technology I
- Technology II
- Design

Under these faculties there are 31 programs (departments) involving 288 professors and 9000 students. The university currently offers three types of degrees/diplomas as described below

- Bachelor's Degree – A newly introduced three year degree program which is commensurate with European Union's generic graduation format. The entry level qualification requires 12 years of study up to high school level. It is desired that all over Europe the uniform and equivalent format will be implemented by the year 2007.
- Master's Degree – An upper level degree with further specialization to be pursued after graduation with bachelor's degree. The duration of the degree will be two years.
- Diploma – A four year curricular program with particular emphasis on industrial experience. Besides regular course work and practice sessions this program involves one year of industrial attachment. By the year 2007 students will only be enrolled in bachelor's and Master's Program.

The academic calendar involve 2 semesters per year, 18 weeks per semester and 24 hour per week. Students' involvement in the curricular activity is assumed to be equivalent to 30 credits per semester. Each course involve 4 hours of classroom interaction which is usually a blend of theory and practice sessions. Total credits earned varies among the departments. Due to lower number of credits assigned to industrial attachment and final year project, the required number of credits for bachelor's degree is expected to be less than 180.

For the purpose of dealing with Information and Computer technology there exist five computing related programs which include the following

- Classical I - Computer Science
  - Theoretical Computer Science
  - Logic, Algorithm and Process development
- Classical II - Applied Computing
  - Computer Engineering
  - Hardware –Software Integration
  - Embedded Systems
  - Industrial Process Automation
  - Internet Communication
- Business Computing
  - Computer Application in Business Processing
  - MIS for Business
  - Business Cycle Engineering
  - SAP, software engineering, UML
  - IT Entrepreneurship
  - Internet for Business Application
- Media Computing
  - Multimedia
  - Digital Image Processing
  - Audio and Video Processing
  - Streaming Technology
  - Multimedia in Internet
- Environmental Computing

- Industrial Environmental Process Simulation
- Environmental Management Information System
- Environmental Hazard Identification and Solution
- Environmental Auditing and Automation
- Processing Expert System Development
- Environmental Process Optimization

During the tour on the 18<sup>th</sup> and 19<sup>th</sup> April, 2005 the team visited two classes and interacted with both the instructor and students. Also we visited different classrooms and laboratories. The experience of visiting the classes is described below.

- i) Course on Linux – In the morning of the 19<sup>th</sup> April, 2005 the team attended the class offered by Professor Lang Bein on Linux. It was an introductory class on Linux. Although the lecture was offered in German Language, many technical matters were understandable. It appeared that the students were highly interested and attentive in the class. The teacher explained each of the feature and commands to the students, and demonstrated them through multimedia projector. Latter, the professor written different problem scenarios in the white board with hints for solution and requested the students to practice the commands. The professor seemed to be very articulate and was able to attract the students very well. Students were also smart enough to ask different questions to the professor. They also interacted with the team members very well and discussed about various matter related to the curriculum and academic affairs. Students revealed that Linux is gradually becoming popular among the practitioners.
  
- ii) Course on Knowledge Based System in Business Education – In the afternoon the team had the opportunity to attend the course on Knowledge Based System in Business Education offered by Professor W. Bodrow. It was an excellent occasion to attend such a lively class. All the interaction was made in English and it was surprising to find that the German students are so good at English. Professor Bodrow seemed to be very popular among the students which was demonstrated by their enthusiastic participation in the discussion. The way Professor Bodrow interacted with the students and guided them to express themselves is exemplary. He seemed to be eloquent and very conversant at English. Through interaction with the student the following aspects were revealed
  - Besides curricular activity many student get involved into different types of jobs. Some of them even have their own firm.
  - No financial support is provided from the public sector. Some form of support from private sector may be feasible depending on the form of involvement.
  - In business computing program (department) development of a general expertise on all aspects of information and communication technology is pursued. No specific emphasis is provided on any particular area. Although programming languages (particularly JAVA) is taught in the program, the extent is pretty limited in depth.

- Many students seemed to have achieved highly advanced level of knowledge through their personal interest. Some acquired the knowledge through industrial attachment. Many students revealed that they could configure routers and operate computer networks. Some even worked as network administrator in private companies. Besides curricular program many of the students pursued industry certification.
- Most of the students wanted to develop career as IT Administrator, Database Manager etc.
- Students revealed that it was the industry which initiated recruitment of the trainees with their own interest of attracting good quality graduates. Also, it was usually cheaper for the industry to develop the trainees (because of lower amount of salaries and taxes).
- Working and trainee students revealed that for technical management there existed a high demand for business degree.
- For the advanced students programming seemed to be easy and besides Java they had also mastered C++, Pascal, Delphi etc.
- But for many students, particularly the beginners, programming appeared to be pretty difficult. The drop out rate may even rise to above 50% in some courses of programming language. They also pointed out that the approach and the competence of the professors were highly significant in this regard.
- Usually in a programming language course the students are required to submit 20 assignments and one project beside the final examination.
- Students usually found topics like data structure, pointers and recursion to be difficult.

Besides visiting IT related facilities the team also met with important personnel of FHTW. The Honorable President of Berlin University of Applied Science, Professor Dr. oec. habil. Herbert Gruner, was kind enough to meet with the delegation and provided valuable insight into the activities of the project. On behalf of BUET Dr. Alam invited Honorable President to visit Bangladesh University of Engineering & Technology (BUET).

#### Brief Schedule of Visit to FHTW

Date	Activity	Remark
17 <sup>th</sup> April, 2005	Discussion Session on project activities and processing with Ms. Tarja	Reporting Activity Scheduling Financial handling
18 <sup>th</sup> April, 2005	Meeting with Project Partners Tour to classrooms and laboratories Sight seeing tour Dinner hosted by Professor Bodrow	Gathering experience regarding ICT teaching and learning

19 <sup>th</sup> April, 2005	Classroom interaction Project Meeting and Information regarding FHTW Observing the class of Professor Bodrow	Gathering experience regarding ICT teaching and learning
------------------------------	---	--

## Visit to Tampere Polytechnic, Finland

The team from Bangladesh visited Tampere Polytechnic from 20<sup>th</sup> to 23<sup>rd</sup> April, 2005. During the visit the team visited different facilities of the institute, met with the academicians and administrative officials, and discussed on the salient features of the CodeWitz Project. This report summarizes the major observations and experiences of the visit.

Tampere Polytechnic is one of the premier institute for studying technology and business in Finland as well as in Europe. It has a long history heritage and academic excellence since 1886 in the form of technological schools. Later in 1992 all the institutes are integrated together to form Tampere Polytechnic. The institute offers 3-Year bachelors degree in technology and business. The university has 5000 students in 4 fields of study divided into 18 study programs. There are 430 regular staff in the institute which include 260 teaching faculties and about 700 visiting lecturers. The number of students enrolling into the institute has been increasing very rapidly in recent years. It also possesses the most number of competent teachers in Finland, highest number of foreign lecturers and a number of foreign students.

The major fields of study include

- Art and Media
  - Media and Communication
  - Fine Arts
- Technology
  - Automobile and Transport Engineering
  - Environmental Engineering
  - Electrical Engineering
  - Computer System Engineering
  - Mechanical and Production Engineering
  - Paper Technology
  - Chemical Engineering
  - Textile Engineering
- Business
  - Business and Administration
  - Business Information System
  - International Business
- Natural Resources
  - Forestry

Besides the field of studies mentioned above it has Teaching Education Center which offers programs on pedagogical issues. The institute also has a computer center which facilitates computer related support for the students and staff.

On the 21<sup>st</sup> April, 2005, the first day of the visit, at the very beginning Ms. Tarja Tapio presented brief overview of educational system in Finland and overview of Tampere Polytechnic. In Finland student start their educational career at the age of 7 in the comprehensive schools where they stay for 9 years. Afterwards they get enrolled in either senior secondary schools or vocational schools where they study for three years. The graduates from the senior schools get enrolled into either polytechnics leading to 3-year B.Sc. degree or universities for 5-year M.Sc. degree.

Many of the students take longer time to complete educational life as they start jobs having pauses in between.

Afterwards the team visited different facilities of the institute. The institute possesses a high quality IT infrastructure with 100 Mbps internet connectivity. It supports 1800 workstations, 60 servers and 8000 user accounts. It also serve vocational school in the vicinity. The team also visited Electronic Systems Laboratory where high quality laboratory activities are supported for the researchers and students of electrical and electronics field. Later the team met with Dr. Eeva Liisa Viskari, a faculty in Environmental System Engineering in Tampere Polytechnic. The team visited laboratories and discusses about future cooperation in the field of environmental engineering.

In the mid-day session, the team also visited Laboratory of Electronic and Computer Systems of Tampere University of Technology. At the university the team was greeted by Professor Hannu-Matti Jarvinen, a famous academician in the field of embedded system engineering. The laboratory provides supports to the students of computer science and engineering in the following areas

- Telecommunication
- Software Engineering
- Computer Technology
- Electronics and Embedded System

Professor Hannu-Matti informed the team that the number of students in software engineering are increasing rapidly and many of them work in the small software firms which gets subcontracts from Nokia for software development.

Later in the day the team met with teachers and students of Electrical and Computer Systems Engineering led by Jari Mikkolainen. All the partner institutes presented their institutes to the audience and discussed various issues in connection with study of computer science and engineering in Finland, Germany and Bangladesh. Also the issue of future student and teacher exchange program had been discussed elaborately. The meeting also participated by Mr. Shahidul H. Kazi, a faculty in the Business Administration Department in Tampere Polytechnic.

In the evening the team attended the dinner party hosted by the Honorable President of Tampere Polytechnic Mr. Markku Lahtinen.

On the 22<sup>nd</sup> April, 2005, the team met with all the partners of Codewitz project to discuss on different features of the project.

In the mid-day session the team visited the Institute of Environmental Engineering and Biotechnology of Tampere University of Technology and met with Dr. Raghida Lepisto. They discussed on various aspects of research activities in the field occurring in the university and scope of future collaboration.

On the 22<sup>nd</sup> April, the team visited two classes on programming language offered by Mrs. Paula Hietala and Mr. Pekka Poyry. In the class of Mrs. Hietala, the instructor taught Java in windows platform. The students asked the instructor a few questions which the instructor elaborated subsequently. Although the lecture was offered in Finnish Language, the execution of the commands was very clear even to us as the explanation provided through visual displays. In the class offered by Mr. Poyry it was

learned that Linux is becoming very popular among students in Finland and database tools such as MySQL are widely used there. Most of the cases students use free software for educational purpose. In both the classes the tendency of extensive practice in tutorial framework is praiseworthy.

In the afternoon session the team met again with codewitz core members to discuss and finalize different aspects of the project. Later in the evening the team joined a dinner party hosted by Mr. Lauri Hietalahti in traditional Finnish environment.

Besides project related activities, the hosts arranged couple of sight seeing tours around Tampere area, the origin of Nokia, the world famous mobile tele-communicational industry. Most of the ICT business and studies seemed to be very closely related with Nokia. Also the students were found to be encouraged by the activities and success of the Telecom giant. It is really amazing to find how an individual organization can affect a generation and a nation.

On the 23<sup>rd</sup> April, Dr. Alam met with Ms. Tarja to discuss on various features of the project and finalize future plans.

#### Brief Schedule of Visit to TAMK

Date	Activity	Remark
21 <sup>th</sup> April, 2005	Visit to ICT facilities in TAMK and Tampere University of Technology Meet with faculties of different departments Meet with the President of TAMK and attend the dinner hosted by him.	Gathering experience on teaching and learning environment
22 <sup>nd</sup> April, 2005	Meeting with Project Partners Tour to classrooms and laboratories Sight seeing tour Dinner hosted by Professor Lauri Hietalahti	Gathering experience regarding ICT teaching and learning
23 <sup>rd</sup> April, 2005	Discussion regarding future project activities and expansions	Plan for the future

**Comparison among the Framework of Programming Education  
in BUET, FHTW and TAMK**

<b>Point of Interest</b>	<b>BUET</b>	<b>FHTW</b>	<b>TAMK</b>
<b>Framework of Teaching Programming Language</b>	Mostly Theoretical	Mostly Practical	Combination of Theory and Practice
<b>Interaction between teacher and student</b>	Not so interactive. Lot of scope to improve.	Interactive but there exist scope for improvement	Interactive but as the students' participation is voluntary, there exist scope of system loss in the efforts of the instructors
<b>Professional Perspective</b>	Lacking industry interaction	Most emphasis is provided to industrial experience and interaction	Although the education of ICT involve lot of hand on tutorial, it seemed that there exist scope to improve students' interaction with the industry thereby increasing professionalism.
<b>Students Participation in Class</b>	Mandatory but students seem to try their best to understand the basics	Voluntary but the students participated in the class enthusiastically	Voluntary. In some cases only few students were present in the class. Overall approach of the students seemed to be a bit casual which might be related with culture and socio-economic characteristics
<b>Difficult aspects in programming language</b>	Pointer, memory handling, logic	Pointer, recursion	Pointer, relationships
<b>Application of CodeWitz Learning Objects</b>	Highly suitable to improve students' understanding	Highly suitable to understand the theory	Suitable for making the learning of programming languages interesting to the students

**Acknowledgement:** Dr. Alam gratefully acknowledges the hospitality and assistance provided by Ms. Tarja Tapio, Mr. Kujansuu Esa, Professor Bodrow and Ms. Irina during the visit. Without their cooperation the visit would not have been so enjoyable and fruitful. Dr. Alam also appreciates the cooperation and assistance provided by the faculties and administrative staffs of both FHTW and TAMK.

## **3.2. Visit of Mr. Mohammed Jahirul Islam from Shahjalal University of Science and Technology (SUST) to FHTW Berlin in Germany and to Tampere Polytechnic in Finland**

Written by Mr. Mohammed Jahirul Islam

### 3.2.1. Visit programme

Please see the programme at 3.1.1.

### 3.2.2. Description of activities

#### Berlin

During this visit I met all the partners of Codewitz Asia-Link Project like BUET, FHTW and TAMK. In FHTW Prof. Dr. Wladimir Bodrow is the project manager as well as the technical manager for implementing the project for *better programming skills*. As I understand his MS students specially from Business Computing department will be involved in this project and I also discussed one MS student from Business Computing department. Ms. Irina Bodrow will be responsible for administrative activities. In addition to these key persons I also met several other professors and students in FHTW and the President of FHTW.

#### Day 1 (17.04.05)

I arrived in Berlin around 2.00 pm (local time). Ms. Irina Bodrow was at airport to receive us. She took me to the FHTW guesthouse where other partners like BUET, and TAMK already came. We all walked around FHTW and enjoy the scenic beauty of FHTW as well as Berlin. According to the statement from Irina, that day was the first summer day for this year.

#### Day 2 (18.04.05)

In that day, we all met Prof. Bodrow at his office at 9.00 am. He welcomed us and started our meeting regarding familiarizing with the teaching at FHTW as well as Germany. He described the infrastructure of FHTW as well as the academic structure basically departments, students and teachers and others who are involved with teaching. Our concentration was at the department of computer science and related departments. It has five computing programs like Computer Science (classical), Applied Computing, Business Computing, Multimedia Computing and Environmental Computing. I experienced some differences in this regard. In SUST we have only one Computer Science and Engineering department and we have Business dept., Environmental Engineering dept where they use computer as a tool for research and implementing business and environmental related problems and theories. I think it's a good idea to separate all different activities in separate programs like FHTW (if possible). In that case a student can go to a specific route from the beginning. In SUST, we teach everything (not in detail) for other departments like business and environmental engineering. Basically this is due to our limitation like infrastructure and financial.

I found one big difference in FHTW that they arrange 75% of lecturing by their own professors and 25% of lecturing by the experts from industry. In SUST 100% lecture was done by the own professors. From my observation, this is a very good practice from the point of learning practical things and get connected to the industry.

Education should have this kind of link with the industry and if a student get the flavor of industry in his student life, it will be easier for him/ her to adapt to the industry soon and provide better service. It is really appreciating. Not only that every after 5 years, they collect the feedback from the industry how their students doing and what are the modern topics that they should concentrate on. Based on it they modify their syllabus.

Day 3 (19.04.05)

During that day I attended in a class regarding programming I (Linux) with 1<sup>st</sup> semester students. Although it was in German language, but the technical terms I understood clearly. It was introductory class in Linux.

I also attended in another masters class of Prof. Bodrow. It was Knowledge-based systems of Business computing. I talked to the students specially how they feel in Programming and what are the problems of their current teaching technique and their solutions. From this experience, I found their system and our system is almost similar, only the difference in group size. There are around 35-40 students in a group whereas we have 60 students in a group in SUST.

At the end, I would like to mention that SUST and FHTW provide equal BSc. studies. The biggest difference is the group size and provide lecturing from industry experts. This method of lecturing will enhance the network between industries and universities that will eventually help students to get a job after completing their BSc. degree.

Tampere

During this visit I met all the partners of Codewitz Asia-Link Project like BUET, FHTW and and the Codewitz Asia-Link Project coordinating partner, TPU. In TPU I met almost all the project staffs like Ms. Tarja Tapio, Project manager, Mr. Esa Kujansuu, Project Technical manager and Ms. Hanna Kinnari, Codewitz Material producer and all other staffs those who are somehow related to Codewitz Asia-Link project and other related projects like Minerva. In addition to these key persons I also met the President of TPU, several professors of several departments and students in TPU.

Day 1 (20.04.05)

I arrived in Pirkkala airport around 14.20 (local time) and TAMK car picks up to the Hotel Homeland. I took rest at Hotel and in the afternoon around 16.50 Mr. Esa and Tarja picks me up from the Hotel to see the city with a city guide. Tampere is in a nice place in between two big lakes. These makes the city more beautiful. Last of all around 19.00 they offered dinner in a famous restaurant and after that I went to Hotel.

Day 2 (21.04.05)

During that day, we all partners got together at 9.00. Ms. Tarja Tapio presented a short description of TAMK. Then we all visited the selected department like Software Systems and Computer Center. Then we went to the Tampere University of Technology in Hervanta. Prof. Hannu- Matti, Head of the institute of Software Systems. He delivered us a brief description of this institute.

In the afternoon, we met with the teachers and students of Programming and we all discuss about the programming studies going through the TAMK. From this discussion, I found 2 big differences between TPU and SUST. In SUST, usually a

report is mandatory even for a small programming assignment and it is kept for future. Whereas in TPU situation is not like this. They don't prepare documentation unless it is a big project. Even writing report is a good practice for professional life. So, from my observation TPU can improve this part. Another difference is the no. of members in a group. In TPU they allow only 2 students in a group for implementing a big project. Whereas in SUST we encourage to work more students in a group say 4 or 5 students. The idea is the world is developing too fast and all the developments are done by a group of scientists and researchers who are working in a team. So teamwork is very important and we in SUST emphasis on teamwork.

We also met the Principal at the dinner party and discussed about the possibility of exchange program between SUST and TPU.

Day 3 (22.04.05)

During that day I attended in a class of Data Structures using JBuilder. Although, the medium of instruction was in Finnish, but the technical terms I understood clearly. Students attendance was very low around 6 students. Because it was the last class of that semester. The same thing happened in the next class in Database. I talked with the students and teacher in Database class. There is no significant difference in teaching method. Only the group size is bigger in SUST. We have 60 students in a group, whereas in TPU only 35 students.

We also visited the Environmental Engineering department at TUT.

At the end, I would like to mention that SUST and TPU provide equal BSc. studies. The biggest difference is the group size with the networking facilities. The speed of the internet is very slow. The possibility of e-learning is quite poor at the moment.

Day 4 (23.04.05)

There is no activities in that day. I left Finland at 6.30 from Pirkkala airport and went to Berlin again.

### 3.2.3. Reports on the visits

#### Berlin

The differences concerning computer programming studies between University of Applied Sciences Berlin (FHTW) and Shahjalal University of Science and Technology (SUST) are presented. The report is based on the idea experienced in FHTW during the visit 17.04.05 to 19.04.05. This report defines the differences in organizational level and in curriculum and as well as from pedagogical point of view.

#### *Organization*

The group size in FHTW is around 35 whereas in SUST it is around 60. This is a remarkable difference. For laboratory classes this group size (60 students) creates a severe problem. Because for 60 students one supporting teacher, 2 students share one computer and no one can practice more. Whereas in FHTW, for lecturing class group size is around 40 and for Lab class the group size is 20 and one supporting teacher. In that case, teacher can support more to all students. So definitely with one supporting teacher in a lab the support time per student is less in SUST than FHTW.

Teachers have very similar working circumstances. Including lab and project hours the teachers of FHTW have around 20 hours for lecturing and practicing per week plus the counseling hours to the students. SUST teachers have the average around the same. In addition to the lecturing and practicing hours in SUST, teachers are also responsible for result processing and some other administrative activities.

In FHTW there are some voluntary courses available whereas in SUST not available. Although there are some optional courses, but we can't give them the full opportunity due to lack of teachers. so these are not optional courses, but almost mandatory.

### *Curriculum*

The number and the content of the programming study program is quite similar in SUST and FHTW. Both institution offer 4 years Bachelor degree program.

In FHTW, students are taking Programming I in 1<sup>st</sup> semester which is 4 hours in a week including lecturing and practice. In 2<sup>nd</sup> semester, they learn Programming II (4 hours in a week both lecturing and practice). In 4<sup>th</sup> semester there is one optional course Programming III of 4 hours in a week. After 2 programming courses in semester 1 and semester 2, students are allowed to take software Engineering (4 hours/ week) or Modeling (4 hours/ week) or Enterprise Software systems (4 hours/ week).

In SUST, students have more lessons than the students in FHTW. For examples, in Structured Programming Language- C) there are 2 hours of lecture and 6 hours lab. So I would say SUST students get more teaching and practice hours than they get in FHTW.

The biggest difference I observed that the requirement of practical work placement. FHTW requires 12 credits working experience to an industry before a student can graduate. In SUST there is a requirement of 6 credits for project/thesis. Only few students can go to industry for project. Definitely this is a good idea if a student can experience at least 6 months working in industry before they graduate. It will help a student to get a job and to provide better service.

### *Pedagogic*

Concerning the pedagogy there was no big differences between FHTW and SUST. I attended 2 courses in their lecturing and practice sessions and talked to the students. From my experience the pedagogical methods are basically same as our institution. In SUST we deliver our lectures mostly with using Multimedia projector. A teacher goes through the slides and explain it in details and at the end he may ask questions to the students. This is a complete interactive process. In labs, this is also interactive process. Students follow the instructions delivered by the teacher and practice in parallel. At the end, teacher offers some assignments somehow big, related to the lecture and students do it at lab. class. In FHTW, the teaching method is almost same as SUST.

In FHTW, generally all students have broadband connections available in the institutions as well as home so that they can somehow maintain e-learning mechanism, I mean students can access to the profs. Website and download the

lecture slides and can go through the slides if he missed the class. But in SUST this is almost impossible at this moment. We have a 64 kbps leased line for internet which is shared by the 250 teachers and 60 students at a time. So the internet becomes very much slow that makes trouble in learning method.

### *Summary*

During the visit I found a significant difference in FHTW with respect to SUST. Their system allows to deliver 75% of lectures by their own professors and rest 25% of lectures by the expert from industry. This establishes a network between universities and industries which is very important in this competitive age. In our institution we have to establish this kind of link with the industry. This part should be improved. Since both institutions share very similar curriculums and teaching methods I would say there is no need for big changes in either institution.

### Tampere

The differences concerning computer programming studies between Tampere Polytechnic (TPU) and Shahjalal University of Science and Technology (SUST) are presented. The report is based on the idea experienced in TPU during the visit 20.04.05 to 23.04.05. This report defines the differences in organizational level and in curriculum and as well as from pedagogical point of view.

### *Organization*

The group size in TPU is around 35 whereas in SUST it is around 60. This is a remarkable difference. For laboratory classes this group size (60 students) creates a severe problem. Because for 60 students one supporting teacher, 2 students share one computer and no one can practice more. Whereas in TPU, for lecturing class group size is around 40 and for Lab class the group size is 20 and one supporting teacher. In that case, teacher can support more to all students. So definitely with one supporting teacher in a lab the support time per student is less in SUST than TPU.

Teachers have very similar working circumstances. Including lab and project hours the teachers of TPU have around 20 hours for lecturing and practicing per week plus the counseling hours to the students. SUST teachers have the average around the same. In addition to the lecturing and practicing hours in SUST, teachers are also responsible for result processing and some other administrative activities.

In TPU there are some voluntary courses available whereas in SUST not available. Although there are some optional courses, but we can't give them the full opportunity due to lack of teachers. So these are not optional courses, but almost mandatory.

### *Curriculum*

The number and the content of the programming study program is quite similar in SUST and TPU. Both institution offer 4 years Bachelor degree program.

In SUST, students have more lessons than the students in TPU. For examples, in Structured Programming Language- C) there are 2 hours of lecture and 6 hours lab. So I would say SUST students get more teaching and practice hours than they get in TPU.

The biggest difference I observed that the requirement of practical work placement. TPU requires one year working experience (internship) before graduation. In SUST there is a requirement of 6 credits for project/thesis for 6 months. Only few students can go to industry for project. Definitely this is a good idea if a student can experience at least 6 months working in industry before they graduate. It will help a student to get a job and to provide better service.

### *Pedagogic*

Concerning the pedagogy there was no big differences between TPU and SUST. I attended 2 courses in their lecturing and practice sessions and talked to the students like Data structure and Database class. From my experience the pedagogical methods are basically same as our institution. In SUST we deliver our lectures mostly with using Multimedia projector. A teacher goes through the slides and explain it in details and at the end he may ask questions to the students. This is a complete interactive process. In labs, this is also interactive process. Students follow the instructions delivered by the teacher and practice in parallel. At the end, teacher offers some assignments somehow big, related to the lecture and students do it at lab. class. In TPU, the teaching method is almost same as SUST.

In TPU, generally all students have broadband connections available in the institutions (2200 students) as well as home so that they can somehow maintain e-learning mechanism, I mean students can access to the profs. website and download the lecture slides and can go through the slides if he missed the class. But in SUST this is almost impossible at this moment. We have a 64 kbps leased line for internet which is shared by the 250 teachers and 60 students at a time. So the internet becomes very much slow that makes trouble in learning method.

### *Summary*

During the visit I found no significant difference between TPU and SUST. Since both institutions share very similar curriculums and teaching methods I would say there is no need for big changes in either institution. But two points I would like to mention here that TPU can improve themselves. This is regarding documentation and team work. In SUST we always encourage students to work in a team and definitely documentation is mandatory even for a small assignment.