Using Pantomime in Teaching OOA&OOD with UML

Vladimir L Pavlov, Vladimir.L.Pavlov@intel.com
Anton Yatsenko, Yatsenko@wl.unn.ru
Agenda

- Introduction
- Training Description
- Training Results
- The Experiment(s)
The Babel Experiment: An Idea

A team of students gets an assignment to create a high-level design for a software system. They are required to use UML and are not allowed to use any other language (English, German, Russian, Ukrainian, etc), either spoken or written. Students are given 4-6 hours to complete the task. This assignment is always presented as an experiment – the students are to discover whether or not UML is “a real language” that can successfully serve as a communication tool within a team.
The Timeline

2001 – Vladimir L Pavlov had developed “The Babel Experiment”

Since 2001 Vladimir has successfully delivered it more than ten times both in the software developing companies and universities

The second author joined the first in June, 2004, and they had developed a TTT (Train The Trainer) course for the Babel Experiment

The first TTT was conducted at the second half of 2004

In March 2005 there was the first delivery of the Babel Experiment by an attendee of our TTT
Agenda

Introduction

Training Description

Training Results

The Experiment(s)
How To Teach UML?

- We do not teach UML – we teach modeling
  - Design patterns are important
  - UML Metamodel is a great example of good design
  - Do not forget about OCL

Practice
Practice
Practice
Practice...
UML – a Language –
a Communication Tool

What does UML have in common with other languages?

What value does UML add comparing to other languages?
After participation in a practical project, students realize the expediency of using UML.

Recommendation of using the UML for software requirement analysis given by students before and after project work.
So, The Problem Is…

- If we want to make students taste all the benefits of UML, we need to give them a chance to participate in a really large software development project.

- It is quite hard to incorporate such project into university curricula.
The Goal

To have a training which will allow students to:

- go through the communication problems that are typical for large software development projects
- obtain the successful experience of applying UML to overcome these problems
The Babel Experiment

- Very intensive training
  - unusual conditions of this experiment allow students to get the teamwork experience similar to what they could learn from a “real” project that would last several weeks
  - “joint eating a peck of salt in the compressed time/space”

- Is based on…
  - The Charades game
  - A legend about the Tower of Babel

- A challenge for students
The Charades Game

- There are two teams (each from 3 to 10 members)
- Members of the first team secretly agree on a word and then they tell this word to only one person from the second team. The chosen person has to pantomime the proposed word to members of his(her) team, and they have to guess the word. (S)he can not use speech or writing.
- Teams exchange their roles as soon as the word is guessed correctly or the second team gives up. Team, which has guessed the word, proposes new word and the other tries to guess, and so on.
- Examples: melioration, placebo, expansion, encapsulation…
The Tower Of Babel

This legend shows that without having a common language human beings are incapable to achieve the common goal.
The Babel Experiment

- Students check whether UML is “a real language”
- It is important that students recognize it as a challenge
- “if you pledge, don’t hedge” mindset
  - To insure that students feel their responsibility for the Experiment results, we always invite a lot of guests/spectators to the presentation, which is the culmination of the event
  - After the presentation the guests discuss the developed model and they make a decision whether the team has managed to solve their task
## Approximate Schedule

<table>
<thead>
<tr>
<th>Day</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The event is announced to students</td>
</tr>
<tr>
<td>1-16</td>
<td>Students prepare for the exam</td>
</tr>
<tr>
<td></td>
<td>Intensive Charades training</td>
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<tr>
<td>8-16</td>
<td>Spectators receive invitations</td>
</tr>
<tr>
<td>17</td>
<td>The exam</td>
</tr>
<tr>
<td>18</td>
<td><strong>The Babel Experiment</strong></td>
</tr>
</tbody>
</table>
The Team Of The Experiment Participants

- Excellent knowledge of OOA/OOP and UML
- 8-10 persons
- Males and females
- Extraverts and introverts
- Close ages
Participants Selection

- Competition is important
  - We usually select 8-10 students out of 20-30

- Verbal exam
  - Open questions

- As an alternative to viva voce examination we have always suggested students to earn industry recognized certifications on UML
  - IBM 486 Object-Oriented Analysis and Design with UML
  - OMG Certified UML Professional
Sample Questions

- Create a class diagram which explains the relation between a Citizen and a Policeman;
- Create UML-diagrams which will describe your plans for the next 3-5 years;
- You are talking with an alien, who understands only the UML language. Explain to him what a TV (an automobile, an air conditioner, an electro-guitar, etc.) is;
- Create UML-diagrams that describe your relations with your family (your neighbors, your colleagues, etc.);
- Create UML-diagrams which retell the fairytale about Cinderella (the Gingerbread man, etc.);
- Using UML, describe the political system in the United States (Russia, Israel, United Kingdom, France, etc.).
Roles And Responsibilities

Participants
- design the model without using speech
- present the experiment results to spectators

Trainer
- prepares the experiment task for participants
- makes sure the training participants follow the Experiment rules
- is not involved into the process of designing a system
- looks after the process and later gives the feedback to participants

Trainer assistant
- supports logistics, organizes lunch and connection with “the outside world”
- meets and manages the spectators
- responsible for insuring that all Experiment participants strictly follow the rules

Spectators (guests)
- attend the presentation
- provide feedback to make the final decision whether the experiment was successful or not (whether it “proves” UML to be a “real language”)
Strike The Four Matches

1. The event starts
   - Instruction of the participants

2. Switch to “speechless” mode
   - Team opens an envelope with the task
   - Team works on the task
   - Light “speechless” lunch
   - Team moves to the presentation room

3. Presentation starts, speech is allowed
   - Presentation
   - Postmortem

4. The event ends
Approximate Timing

10:00 – the strike of the first match, the event starts
  10:30 – the strike of the second match, switch to the “speechless” mode
  14:00 – easy lunch, speech is not allowed
15:00 – the strike of the third match, switch to aloud mode, presentation starts
  15:30 – presentation ends, the discussion with the spectators starts
17:00 – spectators leave the auditorium
  postmortem with participants starts
18:00 – the strike of the forth match, the event ends

We usually organized the Babel Experiment on a weekend, so that more spectators (guests) could attend the presentation
  Sunday seems to be the best option
An Assignment

An assignment consists of two components (parts): one component is unique and is created for each Experiment; the other component is the same in all Experiments that are conducted.
Final Presentation

Is delivered by training participants to invited guests:

- Other students
- Representatives of local software companies
- Sometimes even journalists from local newspapers attend our presentations
Postmortem

- What is the main result of the experiment?
- What went right?
- What went wrong?
- What was a surprise?
- Was any information lost or misinterpreted? Why?
- Lessons learnt

Thank you to each other!
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Results

The Babel Experiment was conducted more than ten times since it had been invented.

It had never failed.

The training was successfully delivered in both academic and corporate environments.

It generated positive feedback from students and customers.
Example of the UML Usage During the Experiment

The message that was received by a trainer when the lunch was delayed during one of the experiments.
Example of the UML Usage During the Experiment

This diagram was created when students organized their cooperation and planned their work on the task.
A Few Words About Special Needs

Once we had a student on our experiment, and this student was a vegetarian.

During the speechless lunch he managed to explain to the training assistant that he needed to have “non-standard” lunch.

- The training assistant was the only person allowed to speak to waiters.

However, just in case if somebody is not able to use UML so sophisticatedly, now we include a question about special need into our pre-experiment survey.
Feedback From Students

...this experience of practical UML-using forced me to change my attitude with regard to UML – now I do understand how it could help me in real-life projects...

...participating in the Experiment helped me to realize that UML is not a kind of abstract “Glass Bead Game”, but rather a very practical tool...

...thanks to the Experiment I was able to understand that usage of different UML diagrams (class diagram, sequence diagram, use-case diagram, etc.) really makes sense when they all are used together, representing different points of view for the modeled system...
...The Babel Experiment was an interesting exercise. The model developed shows how precise and unambiguous UML can be if properly used. I would definitely repeat this kind of training for all UML learners who want to get a feeling of what UML can really give to the team...

- Sergiy Alpayev (Chief Software Architect, ISD, Ukraine) about the Babel Experiment which was organized in April 2001 in Dnipropetrovsk, Ukraine

...The Experiment participants have developed the model which was solid, polished, and contained several very bright ideas...

- professor Viktor Gergel (CS dept., UNN, Russia) about the Babel Experiment which was organized in August 2004 in Nizhniy Novgorod, Russia
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The Experiment Was Always Successful

Students always were able to “prove” that the UML is a “real” language.

Now, we position an experiment as an event where students can check whether they know UML well enough to use it without “regular” language.
Two Teams Working On The Same Task

One team was limited to using only the UML language and the pantomime in their communication.

The other was allowed to use the speech in addition to the UML.

The first team (which was not allowed to use speech) coped with a task more successfully than the other team.

- Their diagrams were more detailed, more elaborated and elegant.
An experiment
“CMMi-P-SPEM”

- We will pick a CMMi Process Area (PA)
- We will have two teams working on defining SPEM model for this PA
- The first team will use the pantomime-based approach, the second will use regular approach
- Then we will compare results

You are welcome to participate
Welcome To Moscow!

- The 1st Software Engineering Conference in Russia SEC(R)
- October 27-28, Moscow (Russia)
- [http://www.secr.ru/](http://www.secr.ru/)
- The experiment "CMMI-P-SPEM" will be organized at SEC(R)
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Summary

The Babel Experiment is a pantomime-based training.

The training was successfully implemented in both academic and corporate environments.

The results of the Experiment were always positive.

We continue to experiment.

Welcome to Moscow on October 27-28, 2005 to the CMMi-P-SPEM experiment.
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http://www.site.uottawa.ca/cseet2005/

You can download this presentation from
http://www.vlpavlov.com/ooaood/