INNOCHEM training event september 2015: summary and follow-up

20-oct-2015

Michael Bredol, local organization committee

Participants and programme: attached

Day 1, september 21st

After a short introduction to *Münster University of Applied Sciences* by Ines Roman, head of the *International Office*, local approaches to didactic evaluation and evolution were presented by Thilo Harth, head of the *Academic Quality Unit*. In the following, Michael Bredol as local project leader gave a summary of his insights from his recent participation in ICEE2015 in Zagreb (Croatia), the *International Conference for Engineering Education*. Download the presentation here:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/day1_icee15.pdf

Michael Bredol and Thilo Harth had a contribution at ICEE15 as well; it can be found here:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/ICEE15_talk.pdf

The full set of proceedings to ICEE15 with more material about Engineering Education can be found here:
http://icee2015.zsem.hr/images/ICEE2015_Proceedings.pdf

Day 2, september 22nd

The larger part of the morning hours was devoted to research exchange in order to define common fields of interest for project work. Several delegates from each participating group presented research topics as well as research structures in their respective institutions.

At the end of the morning session, Frank Dellmann, Vice President for Teaching and International Affairs, gave an oversight about the internationasation strategy of FHMS.

In the afternoon, an introduction into the use of “etherpads” for collaborative text editing was given along with a practical demonstration and a hand-on trial. Here is the presentation for this part of the event:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/day2_etherpad.pdf

Some participants found out immediately and remarked, that instead of the basic version demonstrated in the training event, some “etherpad” variants on several hosts support graphics exchange and mathematical notation as well.

The last part of the afternoon was used for a management meeting, led by Darek Bogdał and Joanna Żelazny. Main topics discussed and agreed:

- Progress reports (including dissemination activities) have to be prepared every three months

- Time sheets for personnel involved have to be prepared and kept on file for potential inspection
- PK will install and administer a project website with both an internal and a public branch. Current address: http://www.innochem.pk.edu.pl
- Modules prepared in the context of “Innochem” will be worth at least three ECTS points
- Next management meeting: march 2016 in Lille, exact date still to be specified by the hosting institution

Day 3, september 23rd

Interactive mathematics using the “IPython notebook” was demonstrated and tested in hands-on trials. Remarks on system installation:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/Installation.pdf

First, a notebook to demonstrate its usefulness as graphical tool in the context of a a nanotechnology lecture was shown (light scattering function in the *Rayleigh-Gans*–limit):
https://www.fh-muenster.de/fb1/downloads/personal/bredol/RG-english.ipynb

Secondly, a brief introduction to the notebook and Python was given and tried out by participants:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/Crash_Course_v0.5.ipynb

Further on, the usage in the context of data evaluation and lab oursework was presented. From thermodynamic VLE experiments a data file was loaded, evaluated and fitted to a theoretical model. Necessary data file and notebook:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/343.txt
https://www.fh-muenster.de/fb1/downloads/personal/bredol/AdvPC_exercise3.v3.ipynb

Notebooks are text files and can easily be shared with other Python users or exported as html–files to those not running IPython. There is a simple mechanism on github for sharing notebooks and display them in a notebook viewer:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/Uploading_files.pdf

Many more readymade notebooks for tutorial purposes or specialized applications in the fields of e.g. hydrodynamics, optics, engineering etc. can be found on the web, provided by a steadily growing and active community.

Day 4, september 24th

In the morning session, Molecular Modelling using a remote computational engine driven by local graphics user interfaces was simulated. Introduction to the approach:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/day4_MM.pdf.pdf

The system used as computational engine (for the workshop actually installed on a simple laptop computer) was GAMESS-US:
http://www.msg.ameslab.gov/gamess/index.html

whereas the graphical user-interface tested was MOLDEN:
http://www.cmbi.ru.nl/molden/howtoget.html

Both are free for academic use and under constant development. As an alternative, somewhat more simple Java-based systems are available for visualization purposes. Example with a suited result file as input:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/Jmol.jar
https://www.fh-muenster.de/fb1/downloads/personal/bredol/chromebenzene.log

In order to demonstrate the workflow, structure opzimization and calculation of IR spectra for the reactive intermediate vinyl alcohol were performed and interpreted in the workshop, simulating part of a student's exercise to analyse the relative thermodynamic stabilities of the isomers acetaldehyde, vinyl alcohol and ethylene oxide. The following input files have been created during the workshop for that purpose using the MOLDEN system:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/voh.inp
https://www.fh-muenster.de/fb1/downloads/personal/bredol/voh_opt.inp

Result files after processing with GAMESS-US from these inputs (to be read with MOLDEN):
https://www.fh-muenster.de/fb1/downloads/personal/bredol/voh.log
https://www.fh-muenster.de/fb1/downloads/personal/bredol/voh_opt.log

In the afternoon, some more presentations with respect to research exchange (left-overs from the tuesday session) were presented.
Contribution by Ulrich Kynast:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/Innochem_RD_UK.pdf
Contribution by Michael Bredol:
https://www.fh-muenster.de/fb1/downloads/personal/bredol/research_mb.pdf

Day 5, september 25th

In this session, potential project output formats were discussed. In order to facilitate the preparation of educational online material, common data formats will have to be defined in this context.

In view of the effort possible in the framework of the project, making already existing material available online (also smaller fragments, where adequate) will be complemented by generation of new output from scratch.

As a first step for collaborative and trans–institutional activity, semester projects should be defined and supervised, since most partners have built such elements into their curriculum, so that integration into the current programmes should not be too difficult.

Moreover, it has been stated by several participants, that the innovative core of the project needs to be communicated more clearly. Participating institutions need to see the added value for them in order to be prepared to integrate the outputs.

With respect to employability, the situation with the participating institutions is diverse. Whereas FHMS and PK report, that a high proprtion of the graduates (estimated more than 90%) is employed after one year, EN sees ca. 25% unemployed after one year, and IPB sees their graduates employed, but often abroad. It appears to be obvious, that the high level of employability reached already over all partners must not be put at risk by any proposed action.

In order to make all outputs as accessible and exchangable as possible, the following list of preferred formats has been compiled:

- Text documents: pdf/A
- Images and pictures: jpeg, pdf
- Vector graphics: svg
- Animations and videos: mpeg4
- Recommended browser: Firefox
- Data compression: zip

If any other software should be needed, installers or links to them have to be provided along with the necessary documents and files.

Copyright: according to regulations set by the EC, all outputs have to be put into the public domain. Before that happens, participants have to adopt a suitable licensing model for their contents, and to guarantee, that permission for all copyright-protected materials included has been granted. The same applies to cross-institutional use of commercial software.

Examination issues: In order to be able to use exmination results at all participating institutions, a percentage-based system needs to be used, with 50% being the pass level. Assessments have to be organised and performed always by the responsible supervisor, who also defines the average workload and thus the ECTS points associated with the module or element.

Follow-up until next Innochem meeting:

- All presented files up to now, and thise shown during forthcoming events, should be made available on our common web platform
- Trans-institutional project assigments should be offered and executed immediately, by bilateral exchange, or through the common web platform. Vitaly Ordomsky from EN and Volkmar Jordan from FHMS already expressed their interest
- If possible, students participating in projects should be invited to the next training event, in order to evaluate their experience