

# Report on the visit to Unify by Tim Brosnan 5-19 August 2000

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## Context

This is a report of a two week consultancy (5<sup>th</sup> –19<sup>th</sup> August 2000) to the UNIFY project at the University of the North in South Africa. The consultancy was an intrinsic part of the two year programme of support set up by the Finnish Training Partnership in collaboration with the Institute of Education, University of London, which was funded by the European Union. The major plank of this support is a team of five people, four from Finland and one from UK, each of whom was contracted to work with one of the sections (physics, chemistry, biology, mathematics, and English and Study Skills. The EU had previously funded a development team from the Free University of Amsterdam, from 1993 – 1998.

UNIFY is a one year foundation course in science, mathematics for about 150 students. It provides an essential bridge between matriculation and the first year university courses in science and mathematics. About 80% of the students on the programme go on to study undergraduate courses. The fees and accommodation for the students have been paid by bursaries from the EU up until now.

The team from Finland and UK leave in October 2000, and the funding from the EU ceases at the end of 2000. From October 2000, the programme will be carried entirely by staff appointed and funded by the University of the North. At the time of the consultancy, funds had not been raised for the bursaries, although various funding agencies had been approached.

## **Terms of Reference of the Consultancy and Initial Discussions**

Tim Brosnan arrived in South Africa on 6<sup>th</sup> August 2000 . He met with UNIFY staff at 8.30 on Monday 7<sup>th</sup> August for informal introductions and initial negotiations on a way of working which was acceptable to all concerned. These discussions revealed the more specific needs with respect to the TORs. These revealed that, although the staff were keen to use IT in their teaching, and all Unify students took a discrete IT course, there was essentially no use of IT within the science and mathematics courses.

For these reasons, the focus of the remainder of the visit was to provide exemplar materials for such uses of IT, and to train Unify staff in the production and use of these and similar materials. A draft timetable of section and individuals meetings was drawn up by Dr. Mayeya, in collaboration with colleagues. Subsequently there were further requests for individual and group meetings. In addition, two whole staff seminars (WSS) were given, focusing on the use of IT in the teaching of science and mathematics, and an analysis of the present situation in the Unify project respectively.

### **Pre-visit web-site**

A [web-site](#) was constructed before the visit, based on a pre-visit understanding of the TORs and posted on the Internet. This had sections detailing:

1. 'The third way: teaching IT capability' – and exemplification of the purpose of teaching IT
2. 'Using ICT to find evaluate and use scientific information' – examples of from chemistry of how Internet-based resources could be found, evaluated and incorporated into teaching and learning materials
3. 'Using spreadsheets for modelling in physical chemistry' – with a link to some examples from physics
4. 'Examples of datalogging' – drawn mainly from chemistry
5. 'CAL references' – a list of papers available on the Internet giving the theory (and some examples) of CAL-based courses
6. 'Some science links' – a set of Internet sites which are useful for teaching/learning science.

Discussions with Dr. Mayeya and other Unify colleagues revealed that the second, third and fourth of these would be useful; that the Unify Internet connection was not fast enough for use of the sixth to be practical, and that the first and fifth would be most useful at a later date. Therefore only selected items from this site were used in the presentations and discussions, although its complete contents were left with the Unify team.

## **Whole Staff Seminars (WSS)**

The two staff seminars were attended by between 15 and 20 members of UNIFY staff

### ***Using IT in Science Education part 1: ideas on what and why***

This seminar aimed to give the Unify team an overview or ‘map’ of the ways in which IT can be used to enhance learning in science and mathematics, under a series of headings: collecting, visualising, analysing, exploring and communicating scientific information.

The purpose of providing this overview was to illustrate to the Unify team that:

7. many aspects of their current would benefit from a judicious use of IT - particularly those that involve the collection and analysis of scientific data, and the visualisation of scientific entities and relationships.
8. the production and use of teaching/learning materials does not need high level IT skills on the part of either the writer (staff) or the user (student) – in particular many effective IT-based activities can be developed with a relatively elementary knowledge of Excel and Word.
9. used appropriately, IT would not detract the desire of the Unify staff to ‘teach their subject’ but can enhance it
10. by developing their students IT skills in the context of helping them learn science better, the Unify team would also making a significant contribution to the empowerment of these students.

Preliminary discussions with Dr. Mayeya and other colleagues had indicated that this presentation would be most effective if it used examples which addressed specific aspects of the existing Unify courses. For this reason a considerable amount of time in the first week (and weekend) was spent in writing new and adapting previously existing examples, the better to match the Unify courses. As the University was relatively quiet at the weekend, its Internet connection was noticeably quicker and advantage was taken of this to download a number of pages and (free) programmes for use in the presentation.

The PowerPoint [presentation](#) used in this seminar is attached to this report. This contains links to the examples used.

The materials used in this presentation were also discussed (and often further developed/adapted) in meetings with sections and individuals later in the week.

### ***Using IT in Science Education part 2: thoughts on how – present and future***

This seminar presented an analysis of the current situation of the Unify course, under a series of headings: people; integration of IT and science; hardware; software; and systems. It then outlined of possible courses of action under the same headings and recommended a number of these.

The main recommendations were:

- 1 **People:** that the course team consider providing one of their current staff with the time and training to develop expertise in the use of IT, rather than continue their quest to employ an additional IT ‘expert’. The person appointed could then act in a co-ordinatory and support role. The reasons for this are two-fold: first there is more likelihood of successfully appointing someone from within the existing team than finding a suitably qualified person from outside it; second (and equally important), the need of the team is for a person who understands both the science taught in the Unify course and IT – this is more likely to be met by retraining an existing member of the staff.
- 2 **Integration of IT and science:** that the current IT course be redesigned, the better to fit with the needs of the science and mathematics courses, and that it be provided with course materials of a quality and quantity comparable with those found on the other Unify courses. Further, that thought be given to ways (detailed in the presentation) to integrate the use of IT into the science and mathematics courses.
- 3 **Hardware:** that the course consider the purchase of a portable CD-writer to allow staff easily to move large files (and sets of files) from place to place – including to conferences where they may be presenting the work of the project. Also, that when funds permit (including the possibility of external funding) that the current (inadequate) Internet connection be upgraded to give the staff and students access to the huge (and free) resources available on the World-Wide-Web.
- 4 **Systems:** that the current log-in system used in the Unify lab be reconfigured. In particular that students be given their own log-in and password and not be allowed to use that of the administrator as happens at present. Without this the system is inherently unstable. Secondly that a portion of the server be allocated as a ‘shared files’ area. This would allow Unify colleagues to upload to this server materials they have produced only once – instead of at present having to install them on all 30 machines individually (where, because they have administrator privileges the students can immediately delete and/or change them – either accidentally or otherwise).

The PowerPoint [presentation](#) used in this seminar is attached to this report.

## **Section and individual discussions**

Tim Brosnan was provided with the booklets of all the Unify courses. These were studied prior to meetings with the various sections to allow the production of materials that targeted particular aspects of the courses. In meeting with sections, these materials were discussed in depth, (including the mechanics of producing them (leading to a development in the capability of team members in the use of Excel and Word), other perceived needs of the section were ascertained (so that further materials could be produced) and the possible role of IT in the work of their section was examined. There was a pronounced enthusiasm amongst members of all the sections both to develop their knowledge of specific IT applications and to think creatively and collaboratively about how these might help their teaching of science, mathematics and ESS.

This enthusiasm was further evidenced by the number of requests for advice from individual staff and students received while Tim Brosnan was working in the Unify computer laboratory writing applications and installing software. At this time the students were writing the reports on their 'Interdisciplinary study', which for most was the first time they had used IT in their main Unify course.

## **Cross-section course**

Discussion with staff during the first week of the course revealed the desire of many to learn how to use the software package PowerPoint., not least so that they could use it to aid talks they give to external agencies and conferences. As a result two 'after-work' sessions were run for any member of staff that wished to attend. They covered both the skills required to use PowerPoint (e.g. creating slides, using master slides; transitions between slides; animation within a slide; and hyper-linking slides to other applications and files) and style guidelines (e.g. not having too many items/word on a slide; keeping the layout simple; not using elaborate transitions and/or actions. The first meeting (on the 7<sup>th</sup> August) was introductory and the second covered more advanced ideas. These courses were attended by over 12 members of the Unify team and additional help was given to individuals during the remainder of the week. By the end of the week a number of members of the team had successfully written PowerPoint presentations for talks they were giving to external audiences.

## **Resources**

A variety of resource materials were left with the Unify project. This consisted of:

- Copies of the two PowerPoint presentations
- Materials written during the visit to support the use of IT in the Unify course
- Materials adapted during the visit to support the use of IT in the Unify course
- Software tutorials brought from the UK
- Web-pages downloaded from the Internet during the visit
- Simulation programmes downloaded from the Internet during the visit.

These materials, and an [index](#) to them (which also left with the Unify team) are attached to this report.

In addition, the Unify team had some software was not currently used or installed on any of their machines. This was installed on a number of the Unify machines – both in the computer laboratory and staff offices and discussions were held with relevant staff (both individually and during the section-based meetings) as to how best it might be used in their courses. These items can also be found in the materials index.

## **Acknowledgement**

Thanks are due to all member of the Unify team for their hospitality during the visit and for the many productive discussions held.