

## Avoiding Digital Imperialism

### Internationalisation of software

#### Graduate Attribute: Global Citizenship

##### How is global citizenship promoted?

In the module Software Production, students develop an awareness of cultural variation through the writing of 'internationalised' software.

##### What triggered this?

The module leader, David Lightfoot, is concerned about 'digital imperialism'. He has done much international work, has undertaken validations in other countries and has been an external examiner for the Arab Open University. There he worked with a Swiss colleague who, necessarily, speaks three languages. He observed that:

*"When you switch languages in the same country you think about it more and so you're more attuned to the needs of other languages."*

With his colleague, David developed a way to present Arabic and other western European languages in the same line of text:

*"So you could type in French and then switch to Arabic and as you typed, the Arabic appeared from right to left. It worked quite well and proved that technical subjects do have an international aspect."*

He became conscious that British/American people often write software which is hard to transport to other parts of the world.

Because of his Erasmus work, David is also conscious of the fact that Britain has a poor record of its students going to other European countries. Many other European students wish to come to Britain and far fewer want to spend time elsewhere:

*"Germany wants half of the student population to have experience in other countries."*

##### How is global citizenship . . .

###### taught . . .

Initially the topic of cultural variation is introduced in a lecture which covers different aspects of internationalisation relevant to software production such as language, alphabets and whether to use a comma for decimal points. David says:

*"The External Examiner thought it was a good idea. I don't think any of the other students felt patronised by it. I hope not."*

David has collected information about cultural diversity that might affect software production.

For example:

*"In some north African countries the day is deemed to start at 6 am. Companies producing software for mobile phones across the world need*

[www.brookes.ac.uk/services/ocslid](http://www.brookes.ac.uk/services/ocslid)

##### What happened here?

*How can students gain cultural awareness and digital literacy through writing 'internationalised' software?*

In collaboration with a group of students, the majority of whom were not British, David developed a lecture on the different aspects of internationalised software, including language and alphabets.

Students produced an English language version of a programme and subsequently an 'internationalised' version where, in effect, the English was 'pulled out'. The next step was to take that 'separated off', culturally dependent material and put it into another language of the group. The important issue was that the underlying software had not changed.

*David Lightfoot  
Principal Lecturer  
International  
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*to know if things are not working across datelines. Getting a train timetable to work through the change of the clock (is problematic). It is no accident that international shipping works entirely on GMT and so on."*

### **practised . . .**

Students write a programme and then, working in groups of 3-4, they transform it into an internationalised version. When marks are allocated, allowance is made for the degree of difficulty involved in internationalising the software. French, for example, would not have the same degree of difficulty as Chinese.

The computer programme is set in the context of safety critical systems, such as control systems in nuclear power stations, which need active intervention to stay safe. Students look for English text, which is then removed and carried off to a separate file. The students produce the new version without changing the programme. Links can be made to the separated materials and the same programme appeared in the designated language.

*"The good thing is when a client says 'We like the programme but we need the interface in Russian', you don't have to say that will take another two years. You say that it will only take two months while we get the translators in to translate the separated text."*

### **. . . and assessed?**

- In Part 1, Task A of the Assessment of Software Production students write about the specific issues regarding conversions of software written for English-speaking users to another culture or country. They are encouraged to use the personal knowledge of members of their group supplemented by research.
- In Part 1, Task B, students write a programme concerned with sorting numbers by developing a simple user interface that communicates with the user in English. They are asked to internationalise the program's user interface and to implement this version of the programme, for the UK locale, in a suitable programming language and platform.
- In Part 1 Task C, students are required to produce a version of the program of for the country discussed in Part 1 Task A.
  
- In Part 2, in a safety-critical application, a programme of high reliability is required to sort twenty real numbers into ascending order. Students have to perform the following two tasks:
  1. Develop a test plan to test the software developed in Part 1
  2. Execute the test plan by running the software on test cases. They produced the programme and also gave a 'demonstration'. The term presentation was not used:

*"As soon as you mention the word presentation they put suits on and get scared. If you say 'Do a demonstration' they do a better job. They don't get scared. They just do and it do a better job. They enjoy it. Saying it is a 'demo' takes the pressure off."*

## **What's the value to students?**

Feedback has been positive and students felt the exercise to be worthwhile:

*"Instead of saying 'What a strange place in the world you've come to' we are taking a genuine and academic interest in cultural variation. Nobody had anything negative to say. It was a good exercise."*

Overall, the exercise encourages students to develop an awareness that software they are writing is going to be used in other parts of the world.

As far as employability is concerned, it remains the case that people who speak English and another language have an advantage. The numbers of those students among UK undergraduates are declining, particularly in technical areas, where students are now no longer learning foreign languages in a serious way:

*"GCHQ, for example, has complained recently that not enough students are coming through*

*education system with modern languages... British students are making themselves less employable than students from other countries who have studied in Britain and learnt English."*

David considers that the most positive outcome was awareness raising among UK home students. British students have learnt something about the issues involved across the world and are:

*"Looking at those issues through the eyes of someone looking at us from another country."*

Thus, students may well have enhanced their employability.

## **What next?**

Undergraduate provision is currently being re-designed and David is looking for the right place to run the exercise and to volunteer the resource. He is certain that it ought to be in the undergraduate programme, suggesting:

*"It would go nicely with modules designed on broad issues. The 'Landscape' module, for example, covers many topics and I said this will be the place to provide a mixture of digital literacy and global citizenship. It's not intellectually difficult but it is a question of awareness."*