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© Pantelis Pavlide Vassilis Korkas, 2004

**Teaching aspects of LSP (Language for Special Purposes) to non-specialists: A case for background courses in translation studies programmes<sup>i</sup>****Vassilis Korkas (University of Surrey) and Pantelis Pavlides (University of Westminster)****ABSTRACT**

The aim of this paper is to provide a rationale for including background courses in science and technology in translation studies programmes. Ultimately, the reason for this is to improve intercultural communication of specialist information at any level, in terms of accuracy, concision and clarity, by familiarising students with scientific concepts and their linguistic interpretation. In this context, various related issues are considered, such as student profiling, the requirements of a specifically designed syllabus, teaching techniques, the use of web resources and assessment methods. The suggestions made are based on empirical observations and in-class experience gained by teaching Principles of Science and Technology on postgraduate translation programmes in two British universities.

**KEYWORDS**

Principles of Science and Technology, scientific and technical translation, domain-specific knowledge, Language for Special Purposes (LSP), science and technology literacy, multidiscursivity, translator competence, web resources, teaching and assessment methods.

**1. Introduction**

An LSP (Language for Special Purposes) is defined as "a formalized and codified variety of language, used for special purposes [...] with the function of communicating information of a specialist nature at any level [...] in the most economic, precise and unambiguous terms possible" (Picht & Draskau, 1985: 3), its special features becoming evident at various levels, such as morphology, syntax and lexis. In this respect, LSPs may be only one part of the picture but their function in specialist communication is indeed of great importance, and should be clearly identified as one of the main factors involved in the translation process.

Two important factors involved in the training of translators are: (a) professional competence in relation to the special field and (b) linguistic proficiency in the LSP of both source and target language (Picht & Draskau, 1985). In other words, it is generally accepted that, when dealing with specialist texts, the translator needs at least a working knowledge of the domain or subject-field concerned, i.e., familiarity with the underlying concepts and constructs, and their linguistic interpretation, preferably in both source and target language, thus ensuring the use of accurate terminology and stylistically appropriate phraseology, which comprise the LSP. This becomes even more pertinent with the exponential increase of specialist knowledge in recent years and the fast growing need for effective intercultural communication i.e., the accurate transfer of specialist linguistic elements. All of the above general considerations

clearly apply in the case of science and technology, which is the focus of this paper.

With respect to this, it is also important to establish clear objectives in translation training programmes. Given that the amount of and access to available information has increased dramatically in recent years, a translation student, who can in the majority of cases be considered to be a non-specialist in a scientific or technological subject, needs to be equipped with a basic grounding in science and technology, which could eventually be used, if nothing else, as a set of selection criteria in the evaluation of the resources used in translation-related research.

The purpose of this paper is to examine how this fundamental knowledge base can be established in a translation programme. A background course, interlinked with practical translation classes, can form the basis for systematically providing and explaining fundamentals in various domains of science and technology. Points to consider are the profile of the students attending the course (most importantly their background and expectations), the requirements of a syllabus specifically designed for the purposes of a translation programme, teaching methods, the use of the Internet as an effective medium of research and finally assessment.

## **2. The rationale for a background course in science and technology**

The aim of such a course is to acquaint translation students (mainly with a background in languages or linguistics and therefore non-specialists in a scientific or technological field) with basic scientific concepts and principles and how these apply to technology, so that they may understand what they read in scientific, medical and technical texts which they will have to deal with as professional translators.

Ultimately, it is anticipated that as translators (language professionals rather than subject specialists), they will be able to make better choices concerning terminological and phraseological problems in the translation of LSP texts, conveying the information contained therein more accurately, clearly and succinctly. Apart from linguistic, cultural and textual aspects, one of the criteria for measuring translation competence is domain or subject-field specific knowledge, which as stated, for specialist translators amounts to a working knowledge of the domain or subject-field. Although we are aware that many still believe that subject competence is of lesser importance than language and transfer competence (Neubert, 1992), we are arguing that for LSP texts, students need to be adequately equipped in order to successfully tackle the inherent complexities of such texts in any language pair.

The above can be connected with the notion that conceives of *science and technology literacy as an aspect (or subset) of a broader notion of literacy*. In recognising a broader concept of literacy, these courses

attempt to give students access to a wider range of discourses or fields of knowledge, thus enabling them to become multi-discursive. As indicated above, the linguistic view of science and technology literacy is important because students need to make sense of science and technology texts, and access to these texts *depends on demystifying and mastering their particular linguistic styles* (Helme & Javed, 1994). The question however remains what is important in this context i.e., what is important for translation students to know within the discourses of science and technology and to what level of detail.

### 3. Student profile

In order to establish a proper framework for designing a background course in science and technology, capable of accommodating the needs of translation students, it is necessary to take certain considerations into account.

In general, “students bring a 'cognitive self-image' that bears on their approach to education, their willingness to study, and their capacity to succeed. For many students, a course in a discipline not their own is 'hard' not because its content is too difficult, but because it is 'packaged' in unfamiliar ways... it is the habit of learning the new relationships that have to be constructed between learner and subject, and the packaging of courses that are highly problematic for the students” (Tobias, 1997), rather than the actual content of those 'packages'. Again according to Tobias, “students who may be fearful, avoidant, and even hostile to courses that we think are “good” for them to take are not dumb; they are different. Theirs is not a failure of intellect, but a failure of fit”. Therefore, we as trainers need to understand what students already know and expect to learn, find the appropriate level of communication and at the same time determine which key concepts to emphasise.

Below are some relevant observations made concerning the classes of Principles of Science and Technology taught by us, the assumption being that these classes are conducted in English:

- It should be clearly understood that the students are non-specialists in the fields of science in general. They come from all backgrounds, not just linguistics, translation or related disciplines. They have not dealt with science since the age of 16 or 18, although they may have some knowledge in the field. Hence, they cannot be taught science the way science students are.
- Students with a science degree studying translation would not normally attend these classes unless they were non-native speakers and wished to improve their understanding of linguistic aspects (phraseology and terminology) of the subject in English.
- Most students are in their early 20s, although a fair number are older and some are classed as mature students.

- All students hold some degree/diploma, either from a British or a foreign university/institution.
- Some students have work experience in various fields and a small number have worked as translators.
- Most students prefer subjects such as biology/genetics, medicine/pharmacology, organic chemistry, etc., at the expense of physics and engineering applications. This preference may be due to the fact that most of the texts they deal with in translation classes have to do with the aforementioned subjects. However, the course should cover as many domains as possible, not just the “preferred” subjects, in order to give a better overall view of science and its concerns in general.
- Students come from different cultural backgrounds, which is an additional complication because linguistic and cultural factors also have to be taken into account. For example, how well do they speak English? Are the concepts familiar (or have they at least been lexicalised) in their culture? Are they resistant to certain teaching methods? Can an even more simplified vocabulary be employed without lowering the overall level? To a certain extent (and without compromising the aims of the course) teaching methods and content should be adapted to the level of the class, which again suggests that it is important to have some idea of what students already know.
- As the students are non-scientists, the LSP is also a barrier. In general, science uses language sparsely and precisely, “ordinary” words acquire specific meanings, and these meanings may be quite different from what they are in other contexts (terminologisation). Although students may be aware of this, they still tend to wonder about phraseology (Tobias, 1997).

#### **4. Syllabus – General considerations**

To scientists, the knowledge imparted within the framework of such a course would appear superficial but as already stated, it is not the aim of the course to produce trained scientists but to give non-specialists access to a wider range of scientific domains, which may be of some use in their work. Thus, the level of detail and specialisation should be considered carefully.

The level considered appropriate in this case is the A/AS level (i.e. the standardised British examinations for 16-18 olds), although in some cases university-level material can be used. Overall, British students who have sat A level examinations in at least one scientific subject (e.g. physics, chemistry, biology etc), appear to be more comfortable in the early stages of the course, when the material discussed is more general and is understandably easier for those students to relate to. In the case of such a background course, different student profiles arise for different countries of origin (where different educational systems and requirements apply), another factor that needs to be taken into account when designing a

syllabus that applies to all students. It is considered sufficient if students from different countries of origin have completed science courses in secondary education, although it would still be necessary to consider issues such as the level of familiarity with scientific concepts and resistance to certain learning techniques (e.g., note-taking, research, multi-dimensional representation of concepts, etc.).

In view of all the above, the following objectives can be set out:

1) Students are *not expected* to:

- Learn about scientific concepts by using scientific methods.
- Reproduce mathematical derivations.
- Learn how to solve problems.
- Become involved in analytical/ experimental/ procedural investigations and activities.

2) Students are *expected* to:

- Acquire at least a rudimentary understanding of major scientific constructs and their applications.
- Acquire a "good" grounding in the language (phraseology and terminology) of science, i.e. the language used to explain scientific concepts and principles.
- Understand basic concepts e.g. velocity, acceleration, force, etc. and their applications, e.g. balancing of forces in aeronautics.
- Understand some (if any) very basic equations, e.g.  $F=ma$ , keeping in mind that students need verbal explanations (For example, the issue of "proportionality" could be raised, explaining the expressions "direct" and "inverse proportionality", so that students can at least understand the relationship between various parameters/variables.).
- Be able to evaluate arguments in relation to various scientific issues, e.g. the implications of the hole in the ozone layer or genetic engineering.

The level of detail and the range of topics also depend on the length of the course, i.e. the number of contact hours. The time required for assessment should also be taken into account, as should the time required for discussion and answering queries. In one case, the course spans the whole academic year, thus providing for more than 40 contact hours, and consequently a much greater variety of subjects is covered, both in science and technology. In the other case, the course lasts only one academic semester, and that is inclusive of the time required for assessment; the range of topics is somewhat limited in comparison to the former case, and the issues of student expectations and prioritisation of subjects become even more important.

Additionally, although terminology (the specialised vocabulary of the field) is dealt with and definitions are given in connection with the principles to which they refer, it is not intended to teach terminology/terminography as a discipline. If however terminology/terminography is not taught as a separate option (and in some institutions it is not), then perhaps some

connection with the discipline of terminology/terminography (Rogers, *to be published*; Rogers, 2000) can be made in an introductory lesson, i.e., simply explaining what an LSP is, what it consists of and mentioning the need for concept systems (and their graphical representation) developed systematically, giving examples throughout the module and discussing issues such as polysemy, synonymy etc. as they arise. The need for standardisation can also be mentioned.

## 5. Indicative Syllabus

The following top-level outline is indicated:

- Motion, forces, energy, power
- Waves, wave properties, electromagnetic radiation
- Atoms, electrons, nuclei, radioactivity
- Electricity, electronics, semiconductor theory, digital computers
- Organic chemistry, chemical reactions, compounds, nomenclature
- Pharmacology, principles of drug action
- Cellular structure, genetics, biochemistry, biotechnology

The above outline covers key areas in physics, chemistry and biology, although it may be expanded or contracted accordingly, depending on the time available, the background knowledge of the students and the level of detail. It is also assumed that the natural progression of knowledge acquisition sets the rules for the level of detail and how quickly one can move from scientific principles to a more in-depth analysis of a technological application. For example, in order to discuss the functions of a computer, one needs to have a basic background in electronics, electricity and, before that, in basic atomic theory (elementary chemistry).

Each unit can be expanded to include as much material as deemed necessary for a more complete understanding of the topic considered, in the context delineated at the outset. For example:

Forces and motion  
Scalar and vector quantities  
Orthogonal axis system  
Resolution of vectors  
Resultants  
Linear motion  
Displacement  
Speed and velocity  
Acceleration/deceleration  
Momentum and force  
Newton's laws of motion  
Types of forces  
Weight  
Tension  
Friction

Normal forces  
Gravity  
Projectile motion  
Circular motion

As an example, an application of the above would be the balancing of forces in aeronautics, i.e. Newton's 1<sup>st</sup> law of motion with regard to the motion of the aircraft and Newton's 3<sup>rd</sup> law of motion with regard to propulsion.

## 6. Teaching – General considerations

The aims and objectives of the course should be stated in the first lesson, to give students a rationale for following the course. A brief overview of the course should also be presented, so as to give students a framework for appreciating the information they receive. A particular point to consider at this stage is the level of collaboration between the tutor teaching Principles of Science and Technology and the tutors teaching technical/scientific translation; students to a certain extent expect some coincidence of the topics considered in these classes, as the purpose of the background information is to support their work in their translation classes. They will acquire more confidence and appreciate the usefulness of the background course if they can apply the knowledge they have gained hands-on in their translation assignments.

For the background information to have maximum effect, the topics should develop logically (as indicated in the expanded outline above), starting with the definition of terms, and progressing to concepts, principles and their applications (i.e., the information flow must be well organised). For example:

semiconductors → p-n junctions → transistors  
→ logic gates → digital computers.

Other points the teacher should consider are the following:

- The information load should be kept at the level of the students.
- It may be necessary to repeat the same thing two or three times, preferably using a different approach on each occasion. In many cases, the educational background of a student is not the only obstacle a teacher has to overcome; there is also the particular learning type to which the teacher needs to adjust.
- It may be necessary to spell words for non-native speakers.
- The teacher should pace him/herself, keeping in mind that students will be taking notes. Traditional note-taking may not clarify the material. In general, science students write down what they do not understand in order to deal with it later, whereas students in other fields are not entirely comfortable with this method. "Active learners seek to



translate new material into a language they can understand, to hang topical detail on some over-arching structure. But this is difficult when one is new to the field and not told where one is heading" (Tobias, 1997).

- Handouts should be given for some topics when there is simply too much to write down. This will also allow more time for discussion. However, not all notes should be given out, as this may lead the students to become mistakenly overconfident and rely completely on the given notes. One should not forget that no two students take notes in the same way.
- As far as possible, visual communication (i.e., visual/graphic representation) of concepts/principles/applications should complement verbalisation (where issues of multi-channel communication, span of awareness, etc., may need to be considered more carefully).
- Every now and then the teacher should stop and ask for questions, expanding on certain points and clarifying grey areas.

A more general issue with regard to teaching that also needs to be considered is, who is qualified to teach such a class. Our present experience shows that there is no unique profile that fits the case: it could be either a scientist with at least a basic knowledge of the intricacies of the translation process and by extension the translation trainees' expectations, or a trained technical translator with professional experience providing him/her with at least a rudimentary insight into the various fields of science and technology. In either case, as Daniel Gouadec (2003: 13) points out, when it comes to training technical translators, the answer to who should teach is "whoever is willing to do it". It is not only the students who are expected to cross the boundaries of their existing knowledge base and move to a field of study which they may find unpleasant, boring or even useless; teachers too should be able to convey this kind of information in an unbiased manner, regardless of their own professional background and should also be prepared to adjust the material intended for delivery to the expectations and profile of their target audience.

## **7. Web Resources**

Given the current rate of development in science and technology in particular, it is generally expected that printed resources can become very quickly outdated (although they still provide accurate information when it comes to fundamentals). The Internet is one resource that can keep up with the pace of development and therefore its use is strongly recommended to the students. It is also worth mentioning that translator competence (O'Hagan & Ashworth, 2002) also involves skills such as web navigation and the effective use of on-line resources and electronic communication.

One possible way of directing the students to web-based background research is to provide, at the end of each lesson, a short list of web sites (of different levels of specialisation, with graphics, films, glossaries, etc.) for consolidation purposes. Alternatively, a more comprehensive list can be provided at the beginning of each semester which the students can subsequently use for reference throughout the course.

The use of web resources and corpora as reference/research material for translation purposes (to assist decision making) is indeed emphasised in current research (Adab, 2003). The corpora should be reliable, representative and accurate. Types of corpora that can be used for background research are:

- Parallel corpora: bi- or multi-lingual, suggesting translation strategies/patterns and offering domain-specific terms.
- Comparable corpora: monolingual (in TL), same domain or text type, demonstrating the use of language in context and extending domain-specific knowledge.

Another potentially valuable resource is an on-line discussion forum where students may correspond with their teacher or with each other in order to clarify various points arising in class or in their assignments. This kind of on-line mailing list service provides a flexible environment of communication between students and tutors, is easy to manage, and also familiarises students with the potential advantages of web-based communication with real people while conducting research, in contrast to merely searching for published glossaries, dictionaries, or similar references (see Fig.1).

(yahoogroup\_homepage.jpg)

Fig. 1: Homepage of a web-based discussion group for a background course.

Another useful function of such a resource is that it can be used as a web-based repository for various types of files that can be used as research material by the students. Every such discussion group is also allotted on-line storage space where a variety of material can be stored and accessed by the members of the group: web links (addresses linking to web sites of interest), files (lecture notes, diagrams, videos, audio files), etc. (see Fig. 2).

(yahoogroup\_links.jpg)

Fig. 2: A detail from the web link archive of the same group. Links are grouped in folders according to topic, making access much easier for the students.

## 8. Assessment Methods

In general, it is difficult to fully assess student achievement with respect to the aims stated in §2, before students start using the acquired knowledge in their work as translators. In other words, it is difficult to acquire a fully dynamic view of student learning and for students to understand how to interpret the assessment. Assessment methods need to be evaluated with respect to the aforementioned aims, and some of the questions to be answered (Science TEKS Toolkit, 2003) are:

- What is the purpose of the assessment?
- Will the results help students?
- What knowledge and skills are to be assessed and how much emphasis is to be placed on each?
- How will the assessment show that students have acquired the knowledge and skills they are learning?
- How will the assessment show the amount of progress students have made?
- Is the purpose of the assessment clear to students, teachers, and other stakeholders?
- Are multiple forms of assessment used in the assessment system?
- Are the assessment tasks engaging?
- Is the information collected worth the effort?
- Can the results be reported in understandable terms?

Choosing the testing method to be implemented is problematic, as any single testing method is biased, applying just one approach to getting at student knowledge and achievement. In other words, "any single testing method has its own particular set of blinders" (Supovitz, 1997).

Nonetheless, given the student objectives outlined in §4 (and all other considerations relating to background, level of expertise, detail and specialisation), two methods are currently being implemented in the form of class (locally developed) tests: Multiple-choice and Comprehension & Précis.

### 8.1 Multiple Choice – Selected Responses

As a first approach, we have opted for the testing method of Selected Responses, in the form of multiple-choice questions and fill-in-the-blanks exercises (to a certain extent also classed as selected responses).

Multiple-choice items are an inexpensive and efficient way of testing for factual ("declarative") knowledge and routine procedures. In some cases, carefully written (non-trivial) multiple-choice items with good "distractors" can fairly accurately distinguish students who grasp a basic concept from those who do not. However, they are not useful for assessing critical or higher order thinking in a subject, the ability to write, or the ability to apply knowledge or solve problems (even though some claim they test students' ability to analyse material). Furthermore, they have a number of inherent problems, such as not being truly objective, being too "narrow", not providing information that will help teachers do a better job, not permitting useful projections of student behaviour and learning, etc.

In the classes taught, it has been observed that a very high proportion of students (over 90% in one instance) managed to obtain a distinction (+70%) in these tests (where 50%-59% is a pass and 60%-69% a merit), which we believe is a consequence of their "narrowness". These results however cannot be explained away, statistically, as "guesses". At the same time, it is dangerous to derive any conclusions or make any assumptions about the students or the success of the course, based on these results, for all the aforementioned reasons, other than that the students can deal with factual knowledge. If the module does not contribute to the overall programme in terms of assessment, and is taught as a background course, the multiple-choice format is acceptable for the purposes stated. However, if the module contributes to the overall assessment of the programme (which is indeed the case in one institution), then the test should be broader in scope, as explained below.

## **8.2 Comprehension & Précis**

If the assessment method is to be related more closely to the aims and objectives stated at the outset, in addition to testing for factual knowledge, it would be pertinent to also test for the application of the acquired knowledge and for synthetic (higher-order) thinking in the form of comprehension and précis exercises, with open-ended questions, based on texts of a scientific or technical nature which could be offered for translation. This would also, to a certain extent, remove the bias of using a single testing method and solve some of the related problems mentioned above. In fact, in tests combining Multiple-choice items with Comprehension & Précis exercises (with the greater weight on the latter), students still achieved a high standard. Furthermore, they found the test more challenging in terms of understanding, level of detail and linguistic aspects, such as grammar/syntax, phraseology, terminology/lexis, cohesion and economy of expression, all of which were assessed.

Finally, whichever testing method is used, the aims and nature of the assessment, the structure of the test, and the weighting of the items should be discussed in class.

## 9. Conclusions

Experience in the delivery of background courses in translation programmes suggests that the need for establishing and consolidating such courses as part of the translation training curriculum is becoming even more pertinent as science and, in particular, technology continues to advance at a rapid pace. The more general notions of subject competence and science & technology literacy have become much more relevant in the training of technical translators and student-specific considerations need to be taken into account when designing a syllabus targeted at this particular aspect of translation teaching. The use of flexible and accessible resources, as well as the selection of appropriate teaching and assessment methods, should in the long run raise the students' awareness of the importance of acquiring such a knowledge base in the course of their studies, and help them relate to this knowledge even in their professional life.

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