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## ESP teachers MUST teach specialist content

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### 0. Introduction

This article is partly in reaction to Wu H & Badger RG (2009) In a strange and uncharted land: ESP teachers' strategies for dealing with unpredicted problems in subject knowledge during class. *English for Specific Purposes* 28:19-32

I have argued elsewhere that there is a gap between English teachers, largely trained in the Humanities, and the subject specialism of their students. In [www.scientificlanguage.com/esp/mountains.pdf](http://www.scientificlanguage.com/esp/mountains.pdf) "The mountains of ESP" I presented this gap in terms of Hutchinson & Waters (1987) two mountains and related it to the ideas of CP Snow. I encouraged humanities teachers to cross to Science mountain and to learn. In [www.scientificlanguage.com/esp/commonground.pdf](http://www.scientificlanguage.com/esp/commonground.pdf) I presented several areas which are the common ground between Humanities and Sciences, including ethics, history, biography, and news. In some cases, the alert language teacher with greater flexibility in lesson content than the specialist teacher can actually bring reports of new developments to the class. Ethics and history belong to all of us but may have lower demands on specialist knowledge therefore can be discussed in language classes. There is plenty of subject content to teach and in this way complementing the subject lectures our students receive.

In a major article on authentic materials [www.scientificlanguage.com/esp/authentic.pdf](http://www.scientificlanguage.com/esp/authentic.pdf) I argued that language teachers should dare to use authentic texts, and must use authentic activities such as summarising, outlining and inferencing. Drawing on research into computer assisted language learning, I advocated exemplification and amplification rather than simplifying. As a major principle, **the content level of the texts should approximate to the content level of the texts studied in the strong language**. For undergraduates this may well mean textbooks and review articles - not research articles. For graduates the mixture will change towards a higher theoretical level and a more practical professional level.

Aware that this seems an impossible demand on the humanities teacher I drew on considerations from Adult First Language Acquisition. In particular, Adults, in their first language and in their speciality often struggle to understand a text. In contrast, there seems to be a frequently unstated expectation that in the language classroom the content must be

instantly understandable to the students. This expectation needs changing closer to the real life scenario of coping with difficulties even in the first language. When it is accepted that both students and teachers struggle to understand a text then there is freedom to read difficult texts. Reading difficult texts is in itself an authentic activity. I also argue that the gap between Subject Specialists and English teachers is useful in that it leads to the authentic task of students explaining the content to a non-specialist. Elsewhere in language teaching, language activities involving communication gaps are artificially created, and here they are authentically provide on a plate. I have therefore already justified the importance of content in ESP classes, and defended the view that content take priority.

I was therefore saddened to read a recent article. In a small case study, Wu and Badger (2009) present five episodes where the teacher handled a question that required subject knowledge. These teachers were Chinese, which the author says places a high expectation on the teacher being very knowledgeable, and showing otherwise is to lose face.

I understand this concept of losing face. It exists also in my home culture, though is probably stronger in China. I have also lived and worked in an Arab country for over 20 years and I have frequently encountered this in my teaching and living. Therefore, in my lectures on classroom management (p19) I directly address this issue, and discuss some of the strategies a teacher can use. [www.scientificlanguage.com/esp/classroom-management.pdf](http://www.scientificlanguage.com/esp/classroom-management.pdf). It is a shame that Wu and Badger ignore the material on how to handle questions that is found in teaching manuals such as Marland (2002) *The craft of the classroom*. (Publisher: Heinemann) for they would find many proven strategies already documented.

In this article I would like to elaborate on the following questions.

1. Categories of teacher knowledge
2. Relationships among experts

### 1. Categories of teacher knowledge

Wu and Badger(2009) p20-21 summaries the categories of teacher knowledge

#### a. Elbaz 1983

- 1) self
- 2) the milieu of teaching
- 3) the subject matter
- 4) curriculum development
- 5) instruction

#### b. Shulman 1986, 1987

- 1) subject matter content knowledge
- 2) pedagogical knowledge
- 3) curricular knowledge
- 4) general pedagogical knowledge

- 5) knowledge of learners and their characteristics
- 6) knowledge of educational contexts
- 7) knowledge of educational ends

**c. Grossmann (1990)**

- 1) general pedagogical knowledge
- 2) subject matter knowledge
- 3) pedagogical content knowledge
- 4) knowledge of context

**d. Ferguson (1997:85)**

- 1) knowledge of the culture and values of the discipline
- 2) knowledge of the epistemological basis of the different disciplines
- 3) knowledge of the genres and discourse patterns

Now, I do not have access to Ferguson and the reference is not given in the article (though some quick googling provided the reference). Therefore it is hard to understand exactly what Ferguson meant by only these three areas. I would have said:

**e. Lowe 2010 (this essay)**

- 1) Subject content, including history and ethics
- 2) Subject reasoning, methodology and skills
- 3) Subject relationship to other subjects
- 4) Language, of all kinds, from phonemics to discourse
- 5) Language skills
- 6) Teaching skills and knowledge

It is surprising that Ferguson does not mention subject content. Wu and Badger though seem to want to justify the exclusion of subject content from the language classroom.

Knowledge of disciplinary cultures and values **must exclude the actual content of the subject because it is quite hard to see what would remain the domain of the subject specialist.** (p21)

So now we have another reason for excluding content. The fear that the language teacher would take over the content teaching of the subject specialist. When I read that I searched the publication date to see if this was a joke. I can find no indication that the authors are joking. They really are concerned that if English teachers taught subject content they would be usurping the place of the subject specialist. Would that this was true! Would that English teachers would learn enough specialist knowledge to hold their own with other experts and become an expert in an area of Science! With a few exceptions, there is very little chance that English teachers will ever come near to rivalling the subject specialists.

Wu and Badger (2009) rightly refer to the importance of the teacher saving face. But there is another element: **it is humiliating for university students and professionals to study school level science in English!** Surely, this is one of the early lessons in the history of ESP that in the early days authentic school biology texts were given to doctors learning English, in the hope that the simpler English would help the doctors to learn.

It is often assumed that Specialised English means General English plus English of the speciality, and this General English means 2000 word families plus the AWL. Therefore, until students get advanced in English, then what they need is a broad general English course covering all the grammar, and many topics from everyday life and culture.

In the past I have explained that linguists commonly believe that the average student needs to know the first two thousand word families, plus the Academic Word List (AWL), then subject specific vocabulary. Now, the second thousand words and the Academic Word List are being questioned. See for instance Chen & Ge (2007), Wang Liang & Ge (2008) for Medicine.

The evidence is pointing to this: general English only needs the first 1000 word families, plus the basics of the grammar. In other words, **from B1 (lower intermediate) onwards our ESP courses need to be very focussed on the needs and speciality of the learner.** To give one example close to hand. A quick analysis of the classic one volume summary of knowledge for the working doctor, the Merck Manual (2009) showed that only 46.7% of the tokens came from the first thousand word families, only 8.1% from the second thousand word families, and 6.5% from the AWL. This indicates that specialism needs to begin in the lower intermediate classes.

**The assumption that technical words are similar in related languages**

Some people believe that technical words are similar in English and French. Only recently I came across another expression of this view in a response to a news article on [www.gnet.tn](http://www.gnet.tn) by Tounsi2, on 20 December 2009. “*A noter que les termes scientifiques sont quasi identiques en français qu'en anglais*”. [Note that scientific terms are almost identical in French and English]. I have already extensively documented on this site that this is not a fair statement. See in particular [www.scientificlanguage.com/esp/words.pdf](http://www.scientificlanguage.com/esp/words.pdf) and [www.scientificlanguage.com/esp/nonverbals.pdf](http://www.scientificlanguage.com/esp/nonverbals.pdf) for details.

Wu & Badger (2009) also quote with approval the advice from the textbook of ESP by Dudley-Evans and St John (1998) that the job of the ESP teacher is to teach the “real content” ie the language, and leave the “carrier content” to the specialists. When I first read

this, I reacted that this distinction is backwards. Usually the subject content is what matters, and language is but a vehicle, or servant, or as the French say *langage véhiculaire*. I can see that the priority of the language teacher is the language. For the language teacher, content is but a means to an end. Much better therefore to talk about the carrier language and the subject content in which the language is a means to an end. This is more authentic. Learners who focus on content sometimes side-track into the language, temporarily, and as needed. **For the ESP learner, language is a means to an end**, it is one more tool. It is not an end in itself. I will come back to this point.

## 2. Relationships among experts

Scholars have always respected the expertise of each other. Multi disciplinary teams are common in research, teaching, medicine, engineering and business. There is usually a common core knowledge and expertise complemented by distinctive expertise. Even your average secondary school is full of experts. In the staff room I remember enjoying the stimulating company of colleagues from a wide range of specialities. Where else can you find groups of 40 or more subject specialists each one devoted to the common task of teaching? As a science teacher I remember noting that each science teacher in the department had a different distinctive specialism. We were not the only ones aware of the differences. For instance, in my first week of teaching the headmaster (who was NOT a science teacher) introduced a haemophiliac into my class. Haemophilia is a genetic problem which means the person concerned bleeds very easily. I was fresh out of University, with appalling discipline problems, yet I was entrusted with this child. I later asked the Headmaster why he had entrusted this delicate child to my inexperienced charge. He told me that I knew more about haemophilia than any other teacher in the school - including knowing more than the head of biology.. Later I was to observe the recruitment selection process and was able to ask senior staff why one was taken in preference to another. Sometimes the younger inexperienced teacher was chosen partly because their subject knowledge was up to date.

At school, we also saw ourselves teachers first, then as subject specialists. Therefore we could and did teach anything we needed to. All staff were encouraged to maintain and improve the level of English and mathematics of the students. I frequently corrected and taught some element of English or mathematics, while deferring to the subject expertise of the specialist. In a similar way at university. I now teach linguistics. I frequently stop and elaborate on a point of English language. We see ourselves as subject specialists and language specialists. I also readily defer to the knowledge of my colleagues in areas where I know I am weak, such as explaining English grammar. I train my students to ask their difficult questions from the teacher with the relevant expertise.

Is part of the problem the low status of the English teacher in a science department? Some countries insist on putting those with doctorates in ESP into an English department, instead of letting doctorates in ESP stay where they belong - in the specialist department.

It is desirable then that English teachers find their departmental home in the subject speciality, as part of a multi-subject team teaching a discipline. How many English teachers feel at home on science mountain? There are some, I have met them. It is not enough to assert that the subject specialist will teach the content and the language will be taught by the English teacher. The English teacher needs to move over to teaching some content, and I have already indicated how in some detail in other essays. Science is not that difficult! There are plenty of popularisations of science that have authority and are readable. There is also a lot to teach - far more than is allocated to the subject teachers. Therefore, ESP teachers can serve the department by teaching content as well as language. ESP teachers already end up teaching language skills, such as reading and summarising skills which are useful in the first language, so the precedent exists. Why not build on the precedent and teach some content?

**NB see the end of this article for two worked examples.**

### **3. I think that technical words are rarely a problem to the students**

I have not tested this statement. My opinion is based upon the following

- a. The work of Cassels and Johnstone (1985) already discussed in my article ‘A question of terminology’ [www.scientificlanguage.com/esp/terminology.pdf](http://www.scientificlanguage.com/esp/terminology.pdf) in which it was shown that native speaker teenagers had more problems with common words used in science than in the technical words
- b. Frequently heard expressions of this idea from scientists who are learners of English. Of course, this does not make the idea right! Above I have already shown referenced my work showing that the frequently assumed idea of the similarity of technical words is not as fair an assumption as most people think.
- c. Even if technical words are a problem to the students, they rarely seem to think so.
- d. The seeming fear of technical words by the humanities students I teach. Now, this could well be that my students are not used to large numbers of technical words, and that the students I teach are lower level students than the scientists.

What can be confidently stated is that technical words are likely to be less of a problem (or perceived as less of a problem) to the student than to the teacher.

### **Conclusions**

There are several reasons why I think the ESP teacher must teach content. These were introduced in the introduction and explained elsewhere. They include:

- a. **Content must lead language - even for weak students.** Focus on language alone is sterile and uninteresting. Focus on content, especially new content ideas and argument with diversions to explain and practice language, will be more interesting, more authentic, and more effective than focussing on language.
- b. **Authentic content and authentic skills.** Focus on content will mean almost total reliance on authentic texts and authentic activities, so that from an early stage professionals are functioning professionally in a different language.

- c. **Teaching content is possible while simultaneously deferring to and exploiting the expertise of colleagues and students.** Good ESP teachers grow in their own expertise and are part of the subject specialist team. The English teacher needs to do their homework, and dare to teach content, while deferring to the expertise of the subject teacher.
- d. **We must avoid humiliating our students by giving them material below their professional level.** There are plenty of areas where content can be taught in English lessons. See the end of this essay for some worked examples.
- e. **We must provide authentically difficult material and set authentically difficult tasks**

Taken together then, I conclude that **an ESP teacher must teach content.**

### References

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## Examples of subject content that a language teacher can use.

### Background

(I have recently been asked to write a semester of teaching material on medical English for the Virtual University of Tunis. Unfortunately under the terms of the contract I signed I cannot make them available. I can though make use of examples.)

### 1. Hand hygiene

My target students are first year pre-clinical students of medicine. As such they have little knowledge of applied medicine. I had therefore chosen the theme of hand hygiene - which turned out to be a rich source of material. I was therefore fascinated when I saw a report on the health section of the BBC news about a new machine for killing bugs published on 26 November 2009 “Device spells doom for superbugs” <http://news.bbc.co.uk/go/pr/fr/-/2/hi/technology/8379604.stm>

The story referenced the Open Access Journal of Physics.

<http://www.iop.org/EJ/abstract/1367-2630/11/11/115017>

I reproduce the journal abstract below. Note:

- a. There were several related articles published in that same issue of the journal which could be of interest to students.
- b. The news on the BBC was very readable and first alerted me to the journal, which I would not normally read.
- c. The journal is Open Access - which is perfect for lesson material, with few fears about copyright.
- d. The journal in this case provided a longer, plain English explanation.

**Abstract.** The mechanisms of sterilization and decontamination of surfaces are compared in direct and post discharge plasma treatments in two low-pressure reactors, microwave and inductively coupled plasma. It is shown that the removal of various biomolecules, such as proteins, pyrogens or peptides, can be obtained at high rates and low temperatures in the inductively coupled plasma (ICP) by using Ar/O<sub>2</sub> mixtures. Similar efficiency is obtained for bacterial spores. Analysis of the discharge conditions illustrates the role of ion bombardment associated with O radicals, leading to a fast etching of organic matter. By contrast, the conditions obtained in the post discharge lead to much lower etching rates but also to a chemical modification of pyrogens, leading to their de-activation. The advantages of the two processes are discussed for the application to the practical case of decontamination of medical devices and reduction of hospital infections, illustrating the advantages and drawbacks of the two approaches. . . . continued

## GENERAL SCIENTIFIC SUMMARY

Introduction and background.

Application of non-equilibrium plasma discharges for sterilization and decontamination of surfaces gains an increased attention since it offers highly effective, low-temperature process without need of toxic substances. However, in spite of numerous studies devoted to this topic, the knowledge regarding the underlying mechanisms of plasma action on biological systems remains still relatively poor, which is especially true in the cases of diverse biomolecules.

Main results.

In order to gain a better insight into the processes occurring on the plasma-biological matter interfaces the plasma action on different biological samples was compared with the plasma properties determined by various diagnostics methods. Furthermore, two plasma sources differing in the position of the treated samples with respect to plasma were used: the samples were located either into the active plasma zone or to the near-post discharge. It is demonstrated that these two arrangements differ significantly not only in the rates at which different biomolecules are eliminated from the surfaces, but also in the nature of the processes leading to this effect: whereas in the first case the principal pathway of biomolecules removal appeared to be their chemical sputtering, chemical etching seems to be the dominating process in the near post-discharge.

Wider implications.

The change of the main mechanism of elimination of biological residuals from surfaces reported in this study has important consequences in view of process optimization as well as its applicability in a real situation, since both pathways pose certain advantages and drawbacks as discussed in the article.

## 2. Can disinfectants breed antibiotic immunity?

In the course I asked students to study the different ways of washing hands. They had to list the advantages and disadvantages of different methods. I threw out as a question to research, if there was any evidence that bacteria could become resistant to disinfectants. Imagine my horror therefore when I read the following story - again on the BBC.

**Disinfectants 'train' superbugs to resist antibiotics.** 28 December 2009. That is clear enough I hope even for an English teacher.

**Story references:**

1. <http://news.bbc.co.uk/2/hi/health/8427399.stm>.
2. The story was picked up elsewhere, including in the French press *Le Nouvel observateur*, mardi 29 décembre, [www.tempsreel.nouvelobs.com](http://www.tempsreel.nouvelobs.com).
3. On 29 December 2009 I saw a link on the RSS feed for Cystic Fibrosis News from Medical News Today to the following <http://www.medicalnewstoday.com/articles/174860.php>

4. Tracking the original journal article down to a paid access journal I found:  
Paul H. Mc Cay, Alain A. Ocampo-Sosa, and Gerard T. A. Fleming  
Effect of subinhibitory concentrations of benzalkonium chloride on the competitiveness of *Pseudomonas aeruginosa* grown in continuous culture  
*Microbiology* 2010 156: 30-38.  
<http://mic.sgmjournals.org/cgi/content/abstract/156/1/30>

What is alarming to me is that some of this kind of research could easily have been done by almost any undergraduate biologist. The work challenges one of the fundamental assumptions of modern medicine - that disinfectants work differently, and can be used liberally, which is in direct contrast to antibiotics with the whole problem of resistance.

Now. Is this difficult for the English teacher to understand?

**There are a host of ways of exploiting this in the lesson. I suggest a few below.**

- a. Bring along the abstract, and ask students to explain it to you.
- b. Ask the students to research similar articles - which provides good English practice in its own right.
- c. Ask the students to apply their background knowledge to explain the problem, and in particular, to explain the implications -so strengthening their inferencing skills.