TEACHING STATISTICS IN A LANGUAGE OTHER THAN THE STUDENTS'

Khidir M. Abdelbasit
Department of Mathematics and Statistics, College of Science, Sultan Qaboos University,
Sultanate of Oman
khidir@squ.edu.om

In many developing countries the language of instruction at universities is English, while teaching at pre-university level is in the local language. The common reason is that most of the scientific literature is in English and teaching in the native language may leave graduates at a disadvantage. Statistical concepts and methods are most effectively taught through real life examples that the students appreciate and understand. Almost all the textbooks used satisfy this requirement for western students, but most of the examples and exercises used are completely alien to students in the developing world. With limited English they have serious difficulties understanding what is explained in lectures and textbooks. The result is loss of interest in the subject and concentration on passing tests instead of acquiring the intended knowledge and skills. The paper discusses language and cultural difficulties faced by the students in learning Statistics and the challenges to instructors.

BACKGROUND

In many developing countries the language of instruction at universities is English, while learning at pre-university level is in the local language. The main reasons for using English are the lack of textbooks and enough literature in the local language and the fact that English is the language of science worldwide. It is thus believed that teaching in the local language is disadvantageous to graduates. At Sultan Qaboos University (SQU) students are required to achieve a specified level in English (about 4 IELTS score) before they can start their science courses. The majority of instructors do not speak Arabic, and the university adopts a policy of communication in English only in class rooms and office hours. This article is based on my experience at SQU, but I believe that the situation will not be very different in universities, where the medium of instruction changes to English.

LANGUAGE AND CULTURAL PROBLEMS

"Language plays a crucial role in the class room" as Kaplan, Fisher et al. (2009) state. Coutis & Wood(2002) report that several studies have shown that students have difficulty with all forms of academic language: reading, writing, speaking and listening and that students from a non-English speaking background (NESB) have more trouble than those from English speaking background(ESB). Problems that face students learning Statistics in a foreign language were brought to the attention of ICOTS at least twenty years ago (see Hubard, 1990; Wood, 1990). The two authors discuss problems faced by students from a NESB in Australian universities. Koh (1994) addresses similar issues for Japanese students in USA. Lessor and Winsor (2009) report experiences with Spanish speakers in USA. It is recognized that such students face language difficulty, cultural related problems in addition to the common difficulty of academic language (see Coutis & Wood 2002; Blignant & Venter, 2002). Difficulties identified include:

- Technical terms and phrases not well explained in dictionaries.
- Confusion caused by the difference between common and technical use of some words.
- The need for more time to process information and hence difficulties in following up in lectures.
- Difficulties in verbalizing their understanding of the text and thus resorting to memorization.
- Tendency not to listen to explanations in lectures and choose to look at the formula and plug in numbers to get the Statistic.

The students in mind in all the above live (at least while studying) in an English speaking community with which they have to communicate and interact daily. Their language is bound to

improve as a result. Students in SQU study in English in their own country and very rarely use English outside classrooms. They suffer from all the difficulties mentioned above and their English does not improve as that of students living in an English speaking community. The majority avoids talking in classrooms unless they have to, resulting in very little teacher student interaction.

CHALLENGES TO INSTRUCTORS

As we all know, Statistical concepts and methods are most effectively taught through real life examples that students understand and appreciate. Almost all the standard introductory textbooks are written with this in mind. Following the example of leading universities, SQU uses standard textbooks (mainly from USA) for Statistics courses and especially introductory ones. Most of the examples setting the scene for a topic in these books as well as examples and exercises are alien to the students. Students do not have a feel for baseball, golf, opinion polls, stock market shares, advertising research, dog sled racing...etc; and examples involving topics like belief in afterlife, abortion, pre-marital sex …etc are simply off limits. Discussions meant to motivate the reader tend to put these students off. As a result, they tend not to listen to what the instructor is saying, and do not read textbooks (Abdelbasit, 2010). At best they go through examples and assigned homework problems. The problem is worse in introduction to probability where games of chance are extensively used as illustrative examples. Because western children grow up with games of chance such examples are effective illustrations. Most of these games are not known to students in developing countries. The instructor can explain how a game is played, but can not make students play it to generate the intended effect. A good number of SQU students never touched a deck of playing cards, and some may be offended by discussing card games in a class.

The effect of all this is that students get bored with the subject and quickly loose interest. Since they have to pass their tests, their attention turns to the art of passing tests rather than acquiring the intended skills and knowledge. Because of language they face problems understanding the context of homework problems and thus go straight to the routine calculations of the required statistics. They end up learning the mechanics but missing the concepts. The task they hate the most is the interpretation of the results. This can hardly be the outcome hoped for especially by a country that invests heavily in its human resources by providing free university education with full board.

The burden of finding effective strategies to overcome these difficulties falls entirely on the instructor. It is easy to argue that the instructor's job is to explain material in class and help those who ask in class or office hours, but the rest is the student's responsibility. Such attitude may comfort the instructor but is unfair to the educational institution, since students with limited knowledge of the language of instruction naturally need more from the instructor. An obvious way of dealing with the problem seems to be:

- To write lecture notes using examples and exercises from the local culture for each course and use current textbooks as references.
- Go slow in lectures and timetable many problem solving contact hours, requiring the instructor to spend much more time interacting with students.

This prolongs the students stay at university and requires a lot of time and effort from the instructor, at least at the start. In the case of SQU, a student normally takes five courses per semester and instructor's teaching load is higher than usual. Faculty members do all the teaching in classes and tutorials as well as marking homework, tests and examinations. They are also required to serve on committees and participate in administration. So this may not be regarded as a feasible solution by either students or teachers.

THE OTHER SIDE OF THE PROBLEM
- Experimental studies need to be carried out to try and compare different approaches of dealing with the problem. Experimenting with teaching methods is unlikely to be welcome in developing countries. This is understandable with problems that are common to all, where studies and literature are usually available. For this problem studies have to be done

at home. Involvement of international educational organizations such as IASE may help in making them possible.

- Difficulties faced by students can naturally cause them to under-perform. Efforts by the instructor to push them are usually confronted by an attitude of safety in numbers. If almost every one is doing badly, then there is no problem. Bad results are annoying to all. The instructor can not help wondering if the semester's effort was worth while, students are disappointed and the institution will want some explanation. While student's course evaluations are understandably harsh on instructors who think this is student's problem, they are equally harsh on instructors who try to push them to work harder. Student's attitude is understandable when a few instructors are choosing the easy way out. Such a situation easily pushes others towards milder tests and class dependent assessment that mask the learning problems.

- Universities in developing countries naturally aspire for international recognition and higher ranking, which is achieved by quality research output. For this reason and following leading research universities around the world, faculty career advancement (promotion) is achieved practically entirely on academic research.

- While students have their eyes on grades and naturally push towards getting the best with less effort, instructors have their eyes on their careers. Since efforts in teaching do not contribute to career advancement, less and less time and effort is spent in the teaching arena. This eliminates dedication to teaching since it receives no recognition, and the satisfaction obtained from it is personal rather than institutional.

The instructor is thus required to deliver the course material well using lectures, tutorials and homework single handed. In addition to that he has to cover the course material in time and publish research if aspiring for promotion. Such conflicting requirements on the instructor's time naturally lead to a situation where instructors spend less time on teaching related activities in favor of research and go easier on students to avoid bad results. The result is a disastrous equilibrium state. The teaching is a lot lighter for the instructor and time is spared for other activities, the students are having it easy and the institution is happy with reported results and better research output.

A POSSIBLE SOLUTION

We reiterate here what was suggested by Abdelbasit (2010). A student learning in a foreign language and trying to understand a specific point gets distracted by lengthy explanations and discouraged by thick textbooks to begin with. Lengthy oral explanations are not helpful either. Concepts and techniques are better explained briefly with the use of many familiar examples and exercises to help students absorb the material by osmosis. A number of statistical concepts are too difficult to understand in a foreign language and are more effectively communicated to the students in their own language. We need textbooks written in English that are brief on explanations and discussions, but contain plenty of examples and exercises from the students own culture. They also need to include good glossaries where technical terms and concepts are explained in the local language. The natural candidates for producing such text books are statisticians at the universities concerned. As mentioned earlier these are overwhelmed by various duties and devoting time and effort to produce such a book locally is an extra burden with little reward, especially when the institution sees no problem and every thing seems to be going fine.

Universities in developing countries generally follow initiatives of leading western universities and projects with international involvement are generally well received. The needed textbooks described above have better chance with international involvement and encouragement, such as the involvement of the IASE. Different versions can be produced for different geographical areas and cultures. The basic material will be the same with examples and exercises varying to some extent from one version to the other and glossaries in local languages. To begin with one book can be written with appendices containing extra local examples and exercises together with a glossary explaining key concepts in the local language. This could lay the foundation for better statistical education in developing countries, help draw international attention to the problem and encourage further work and improvement. The problem may not seem big enough to warrant such

a project, but without good statistical education in developing countries statistical progress will remain relying entirely on foreign consultancy and little self-initiated promotion or improvement can to be expected.

CONCLUSION

Students in developing countries studying Statistics in English have more learning difficulties than their counterparts studying abroad. They find thick expansive textbooks discouraging and generally only look up examples in the text. Since these are the vast majority of the country's students this has a direct effect on its human resources. The problem can be alleviated by short textbooks with simple language that take into account both the language and cultural aspects. These can have illustrations, examples and exercises from the local culture as appendices, in addition to a glossary explaining key concepts in the local language. International supervision and support are needed to make this a reality. Statistical education in developing countries is the base for statistical progress. Such progress and development are essential to cope with today's quantitative world, especially for cultures that traditionally view the world as more qualitative. It is hoped that IASE will initiate and support an international introductory text book that will contribute to the improvement of statistical education in developing countries.

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