
Comparing British and American Tertiary Education: Two Personal Perspectives

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In this article, we discuss our observations of the American and British university systems. We don't claim to be experts on either system and certainly did not complete a comprehensive study of the two systems, but we do find some distinctions noteworthy. We share some of the contrasts (not value judgments) we have found most interesting from our recent experiences. Beth has been teaching at small universities in California for 9 years and recently visited the Royal Statistical Society Centre for Statistical Education in April 2002, where she had the opportunity to observe some "typical" class sessions and to talk with faculty members at different universities. Mary completed her education in England, taught in a comprehensive school in Sussex for 8 years, moved to America and taught at a public "magnet" high school in Virginia for 5 years, and then spent the last 2 years teaching at Cal Poly. Clearly these are limited and often out-of-date experiences, and we often make very broad generalizations, but we hope our comments will encourage further reflection and discussion on how our countries can learn from each other. We especially hope you will tell us where our observations have been short-sighted or out of date.

University Statistics Classes

By far, our most common reaction to the general introductory statistics classes in the two university systems is the high degree of similarity in the content and culture of the classes. While we may have expected the similarity in content and pedagogy, we also find student maturity levels and motivation to be similar as well – low. There appears to be a common lament by educators that students do not maintain sufficient personal responsibility. Despite our collective efforts to tailor the material to student interest, to invoke more classroom participation, and to incorporate technology to minimize computational drudgery, it seems many students still treat the course as an after thought and do not invest significant effort into their learning of statistics. While most statistics instructors still rely on fairly standard lecture formats, there are examples in both countries of smaller group discussions and lab environments. Still, this is more so at the teaching oriented institutions.

There is also a similar debate in what statistics instruction should look like for more mathematically capable students. A current discussion in the US concerns the mathematical statistics course sequence, typically the first courses for mathematics and statistics majors. Efforts are being made to infuse more data into these courses and to give them a more applied focus. Some of these efforts are driven by the desire to convince more students to concentrate their studies in statistics by giving them a more balanced view of the discipline.

College Expectations and Costs

One possible explanation for the complacent attitude in the American system is the more common expectation of a college degree. High school guidance offices are much more versed on colleges, and students focus on SAT scores and transcripts in order to get into a more prestigious school. US students tend to assume they will go to college and then often fail to treat it as a special opportunity or privilege, instead it becomes a temporary position before the more important career initiation. Fewer see it as an opportunity to expand their horizons or develop lifelong learning habits. This is in spite of the

sometimes extraordinary high costs associated with going to college in the US. Tuition for “private” universities can require families to pay more than \$25,000/year. There are grant, employment, and financial aid options to help defray costs and perhaps students fail to fully understand the large financial investment in their education.

Being accepted to a university is much more competitive in Britain, with fewer students staying in school until the age of 18. Guidance counselors offer more information about work opportunities and job preparation. This has both advantages and disadvantages – you don’t want a student to be “labeled” too early and put in the wrong track, but on the other hand, universities aren’t for everyone. At the same time, students in the US appear to have more options in how they complete their education. In the UK, if you fail your University exams, you are out. In order to continue you have to either pay all the tuition yourself or persuade the local education authority to pay for you for an extra year – very unlikely. Costs for schools in the UK system are comparable to “public” universities in the US, where much of the funding comes from the state. Currently students are being asked to pay £1000+ (\$1500) a year towards tuition. While students in the US must pay more to attend public schools “out of state,” there is no such home county differentiation in the UK. Still, the ability for UK students to earn money through a holiday job is much lower, and there are plenty of students who cannot find any job to support them through school. This also explains why there are fewer “older” students in the system. In the US, students can enroll in school “part time” and can easily return to schooling even after an extended absence. These students are often more focused and motivated since they have had more time to determine their goals.

Instructors in both systems engage in similar conversations about reluctance to impose additional costs on students and the high percentage of working students (and the consequent impact on students’ ability to focus on their coursework). It is amazing how similar these conversations are given the large discrepancy in initial out of pocket expenses.

One large distinction in the discussion of costs centers on textbooks. In the US students typically are required to buy a textbook for each course, costing roughly \$100/course, though with some hope of returning the book for compensation after the course. This is very standard practice, and students often complain if there is not detailed exposition and numerous worked out examples accompanying all course materials. Textbooks are much cheaper to buy in England, but there is much less

instructor dependence on the textbook. Students are often asked to buy course notes rather than a standard textbook. Then students are expected to learn what is in the purchased materials *on top of* what is discussed in class. In the US the book is often seen as a substitute to lecture rather than additional material. Conversations among US educators, particular in statistics education, often concern how to motivate and prepare students to read the textbook. Familiarity with the textbook material appears much more expected in the UK, with students utilizing books in the library when they cannot afford to purchase them.

Homogeneity of students

A consequence of the UK university system is considerably more homogeneity among the students. Specialization by the age of 16 is pretty unheard of in the US where many students choose a major area of study only after the second of four years of university study. The first two years often consist of a large fraction of “general education” courses as schools strive to impart a well-rounded educational experience. For example, a statistics major will also take university courses in areas including English, history, and science. Educators often argue that students cannot decide by age 18 or 20 what they want to do and need to be exposed to many different ideas and ways of thinking. Having students focus earlier as in the UK allows for more tailoring of content and stronger coordination among courses. Usually the whole class is made up of one major all in the same year. A student can spend every day for three years with the same people in every class, and students can have the same teacher for several years. This also appears to allow students to delve into their chosen discipline more deeply before leaving the university. Teachers spend more time with the same students but can end up teaching many different courses simultaneously, where in the US they will often have more similarity in the courses they teach but a larger number of different students.

While statistics does not appear to be a highly valued course by many other disciplines in both countries, in the US, students are more likely to have courses in quantitative literacy as part of their general education courses. US classes are also quite diverse, in student major and student ability levels. This adds a particular challenge to instructors of general education courses, who may find themselves working with electrical engineers and English majors in the same course. There usually is some division of students, often by major and prerequisite, but many also feel the diversity is a benefit to the students, as they learn to communicate and collaborate with students in other degree programs,

learn a common statistical language, and experience different perspectives.

While students in the US do take a larger variety of topics, there appears to be much more repetition of material. In England, fewer topics are focused on, but they are taught only once. Students are more streamed by ability so only the top third get to learn, say, the quadratic equation. The lower sets learn how to write a cheque, how to get credit, how to book a holiday. There is much more push for “education for all” in the US, whether the student wants it or not. Both countries are concerned with the preparation of students coming into statistics courses, feeling they are spending too much time reviewing equations for lines and other algebra skills. Efforts have been made in the US to lower the mathematical prerequisites in this courses (“statistics without formulas”) but it is never clear where the “fault” lies concerning students’ inability to retain earlier knowledge.

Assessment of Students

Students in the US often complete a combination of weekly homework assignments, lab assignments, projects, quizzes, and 1-2 exams during the term before the final. Instructors and student assistants can spend considerable time evaluating students and designing new assessment tasks, especially with the renewed focus on “authentic assessment” and formative evaluation in statistics. The goal is to provide students with frequent feedback, positive encouragement, and multiple opportunities to demonstrate their abilities. A negative consequence is American students’ obsession with “points”. These points often serve as the sole motivation for completing assignments. Students demand the instant feedback, but only in terms of how their grade is affected, less on reflection on their learning.

In contrast to the focus on formative assessment in the US, in the UK much more weight is put on the final course exams. There are fewer quizzes, tests, and graded HW assessments during the course. Constant reaffirmation and assessment is not given or expected in England and instructors spend less time cajoling students to complete their assignments. There is more of a feeling for students to do the work and obtain the degree, or don’t and you won’t. This could be a consequence of the more focused study on courses of interest. A consequence is UK instructors appear to spend less time providing formative feedback and more time designing courses and reflecting on pedagogical issues.

This distinction extends to how students earn their degrees. In the US, degrees are typically conferred after successful completion of a set list of courses usually over four years, whereas most British degrees are based on cumulative exams at the end of 3 years. The UK approach appears to require more long-term memory, and thus deeper understanding of the subject matter, whereas students in the US can have trouble linking ideas between classes. US students often feel they succeed by regurgitating more than integrating or applying their knowledge. On the plus side, this can be less stressful for students and may benefit them through the additional variety of topics.

National Standards

Degree of specialization in the UK appears aided by stricter levels of government standards for curriculum. While we have curricular “recommendations” in the US (from professional societies, accrediting agencies), there is less accountability and still tremendous flexibility and variability. In fact, state standards can look much different from the national standards. While there is more enforcement of these state standards, there is still much debate about their nature. Movements to have an exit exam in high school have been fought fiercely, adding to the diversity of student backgrounds in college courses. There is also more debate about who should be responsible for teaching statistics to students from other disciplines.

An encouraging sign in the United States is the proliferation of requirements in “data analysis and probability” into the K-12 curriculum. The most recent *NCTM Standards* (2000) includes explicitly expectations on formulating questions, selecting and using appropriate methods to analyze data, and making inferences and predictions based on the data. These expectations begin in the first 3 years of schools and the ideas are repeated, with increasing levels of sophistication, throughout schooling. These are fairly new recommendations with regards to probability and data analysis, and it is not completely clear what their impact will be. However, teacher preparation to teach these topics, which typically were not included in the teacher’s own schooling, has become a large issue. The emphasis on “data handling” in the UK appears similar and can provide a great model.

Teacher Preparation

There does appear to be a difference in philosophy on the necessary content knowledge of future teachers (both between and within countries). In the UK, the focus is almost exclusively on teaching the prospective

teachers in depth about the material they will be teaching. Teacher preparation in the US appears to require prospective teachers to learn the content knowledge of the discipline more deeply beyond the content they will be teaching. The variety of courses required in the US appears here as well – a mathematics teaching credential in the States even includes a course in American History. Much thought is also being given to how to best recruit and retain teachers in mathematics, especially with the addition of more quantitative literacy components throughout primary and secondary education. We seem to be slowly learning that statistics content is not simply a subset of mathematics content and requires distinct ways of thinking and preparation.

The Culture

The “feel” of the educational environment can be quite different. In the US, far more time is spent on building self-esteem and confidence, students are publicly recognized and encouraged for their achievement. In the UK success is expected but certainly not publicly encouraged. Parental involvement can be much stronger in the US. This can lead to unfortunate extremes, with

choice of major sometimes determined by the parent instead of the student. Even worse, some American parents will lie for their students, often allowing students to not be held accountable for their mistakes or deviant behavior. This extends to cheating. Incidents are sometimes swept under the rug in the U.S., perhaps contributing to a student expectation. Much more effort is expended in the UK on expecting and preventing cheating.

Conclusion

While these have been very personal, insular perspectives, we do find many similarities in how instructors interact with students and what we want from our students. In both countries, much of statistics instruction is still traditional lecture method, and many students are still disengaged and unmotivated. There is much thought on how to improve statistical education at all levels, but there are still strong impediments to change and uncertainty about how any change should be led (e.g., top-down vs. ground swell). Many of these issues appear to relate to how students respond to the educational environment in general.

Letters to the editor...

From: David A. Smith das@MATH.DUKE.EDU
Re: Online workshop on online materials - July 14-18

Dear colleagues:

We are offering (for the second time) an online workshop in the MAA Prep series on Authoring Online Interactive Materials in Mathematics, to be presented during the week of July 14. At <http://www.maa.org/pfdev/prep/prep.html> you can read about how to apply for a Prep workshop, and you can download the application form. On this same page, you can read a brief description of our workshop — here is the first paragraph:

“This online workshop is for participants with a basic background in web page construction who want to create interactive online learning materials in mathematics. Participants should apply in teams of two or more and team members should plan to be at the same physical location during the workshop. Before the workshop, the team should agree on the project to be developed.”

You can also link from this page to the course page with more details, or you can go directly to:

<http://www.math.duke.edu/education/prep03/>.

David Smith, Lang Moore, Frank Wattenberg

