

Response to
The Committee for the Evaluation of Statistics Study Programs

The Department of Statistics and Operations Research
Tel Aviv University

July 2010

In March 2010 the evaluation committee of the Council for Higher Education (CHE) visited the Department of Statistics and Operations Research at Tel Aviv University. In June 2010 we received from the CHE two reports from the committee, one directed specifically to Tel Aviv University and the other on statistics education in Israel as a whole. The department is grateful for this opportunity to reply to the reports.

We want to begin by thanking the committee for their thoughtful, and thought provoking, summary and recommendations. The committee's reports include many good ideas and constructive comments.

The committee's report on the Department of Statistics and Operations Research and our study programs includes many positive comments. The committee noted in particular the high quality of the faculty and our administrative staff, the general satisfaction of our students at all degree levels and the high degree of collegiality in the department. We appreciate these compliments on our program. The committee also cites the quality and valuable contribution of our adjunct faculty; these individuals are an integral part of our teaching program and we join the committee in praising their excellent work.

The following sections are organized around the specific issues that the committee emphasized in its reports and its recommendations. All page numbers refer to the report for Tel Aviv University rather than the general report unless specifically stated otherwise.

Size of the Department

The committee focused its first recommendation on the size of the department:

1. "It is crucial that the size of the Department does not fall below its current size, and highly desirable that another position or two be added."

This point is reiterated, at a national level, in recommendation 3.2 of the committee's general report.

Further, it is important to note that when the committee writes "current size" in the recommendation for TAU, they refer to our written quality evaluation, which related to the 2008-9 academic year, when the department included 13 faculty members. On page 4 of their report, the committee writes that "the Department currently has 13 faculty members", down from 20.5, with one more retirement "imminent". We now have 12 faculty members, as the additional retirement (Prof. Uri Liberman) already occurred.

We agree with the committee that the current size of our department is already below the minimal level needed to successfully carry out our academic agenda, including research, our "in house" B Sc and M Sc study programs, and the large amount of teaching and research collaboration in which we are engaged across the campus.

The committee comments, in Section 2.1.3 of the general report, on the importance of designating new faculty positions for statistics departments. In the TAU report, the committee goes further (page 5), noting that our department "has to compete for slots with the Pure and Applied Mathematics Departments". We agree with the committee that the department could prepare much more effectively for the future with knowledge that future hiring will indeed keep the department at the level of 14-15 full time faculty members recommended by the committee.

Strategic Planning

The most important criticism from the committee is directed toward the department's strategic planning. "The Committee was disappointed with the attitude of the Department *vis a vis* the future. There seemed to be little in the way of planning for the future other than hoping that there will be no further cuts." And in the preface to its recommendations: "we found a department that to a large extent was floundering due to the critical financial situation of the University."

The committee points to several factors that have contributed to this situation:

- The financial problems faced by Tel Aviv University and the resulting cuts in the number of faculty members throughout the university, and in particular in our department.
- The fact that most of our current faculty members will retire in the next decade.
- The short terms of service of department and school chairs.
- The lack of appropriate credit and recognition for teaching service courses.

The committee's first two recommendations relate directly to these concerns:

1. "It is crucial that the size of the Department does not fall below its current size, and highly desirable that another position or two be added."
2. "The Department .. should develop a long term development plan, and decide which areas it should concentrate on."

We appreciate the committee's concern that the department needs to make decisions about our focus areas. However, we also are convinced that planning is much more difficult in Israel than in the US or Europe. We have a small pool of potential hires, in contrast to the very large group of new Ph D's who seek employment in the US and Europe. This makes it almost impossible to target specialty areas and still to insist on high academic standards.

The committee is correct when they write, in their general report, that "the department may be inclined to jump at a target of opportunity even if this does not create the ideal balance across the various sub-disciplines". Again, this is an almost inevitable consequence of the limited pool of candidates. Academic achievement and promise are, and will remain, the primary criteria for bringing new researchers into the

department. Nonetheless, we do consider breadth in our hiring and it is understood and agreed in the department that our statistics and operations research study programs cannot survive without sufficient faculty groups to support them. The department's needs in these areas are also an important element in recruiting and hiring new faculty.

The committee is also critical of the chain of communication in the university, writing on page 5: "The Committee is under the impression there is little communication between University management and the Department, which makes departmental planning all the more difficult." We totally agree with this statement. The university administration often identifies the department merely as a subunit of the School of Mathematical Sciences. This was exemplified recently, in the case of a new faculty member recruited by our department. There were no meetings between the administration and the department on the new hire; all negotiations were carried out with the head of the school. More frequent contact with the university leadership would be fruitful in setting a framework for strategic planning and development.

The committee points in particular (page 8 and recommendation 2) to the value of applied probability as a research domain within the department. In past discussions among department members, there has been general agreement that applied probability is a relevant area and that we would welcome applications from talented young researchers. We think that the committee did not receive a correct impression on our attitude toward applied probability. In the past, our department also included mathematicians whose research was in theoretical probability. With the current limitation on the size of the department we have decided not to promote this area in future hires. We think that the Department of Pure Mathematics at Tel Aviv University provides a more natural home for these researchers.

The committee writes (page 8) that "it might be more natural not to hire in game theory". Almost since the inception of the department, game theory has been one of our areas of expertise. Two of our five most recent hires are top game theorists. They carry out mathematical research in game theory that would not fit in to the "softer" research agenda of, say, the economics department. On the other hand, their research in game theory has a broad scope, with connections to applied probability, convex analysis, quantum probability, complexity, operations research, decision theory, machine learning and more, and they regularly teach probability courses, in addition to game theory courses. So we expect to maintain a strong presence in game theory. Future applicants for faculty positions by game theory researchers will be evaluated with respect to their academic promise and the needs of the department.

The committee encourages the department (recommendation 3.4 in the general report) to "expand horizons" in future hiring. In particular, the committee suggests that recent Ph D's in computer science might be good candidates for positions in our department. We agree and will be happy to consider such applicants. During the past year our department chair spoke with the head of the School of Computer Science and told him that good candidates with expertise in machine learning should be encouraged to look also at the Department of Statistics and Operations Research.

We are convinced that the variety of research areas in the department is effective and successful academically. We believe that a department of about 15-16 faculty is

needed to retain our intellectual diversity (i.e. a reduction of 20%-25% from our size 10 years ago). We cannot achieve this goal with 12-13 faculty members. There is no urgency to grow immediately, but we believe that the TAU leadership should promote the growth of the department as a strategic vision.

Relations with the School of Mathematical Sciences

The committee discusses the "natural home" for statistics departments at all the universities (section 2.1.1 of the general report). The Department of Statistics and Operations Research at Tel Aviv University was once part of the Faculty of Social Sciences and later moved to the Faculty of Exact Sciences, as one wing of the School of Mathematical Sciences together with Pure Mathematics, Applied Mathematics and Computer Science (which eventually became an independent school). The Hebrew University and Haifa University have independent departments in the Faculty of Social Sciences.

There are a number of reasons for this diversity. In part it stems from historical decisions. But it also reflects the highly interdisciplinary nature of statistics, which the committee emphasizes in section 1.1 of their general report.

With respect to the department at Tel Aviv University, the committee expresses concern that being in the School of Mathematical Sciences has limited our ability to obtain positions for new faculty members, due to competition with young mathematicians (pages 5-6 of the TAU report). This concern is also reflected in the committee's comments about the need to allocate hiring slots for statistics departments (see the previous item in the response).

We agree with the committee that it is essential to establish the resources (in particular number of faculty) that are needed for the health of the department and its professional mission. This must be done independently of the needs of the other parts of the School of Mathematical Sciences. The University should ensure that hiring takes into account the desired size and mixture of the department.

National Statistics Research Center and Courses

One of the far-reaching proposals from the committee is their encouragement to establish a National Statistics Center and to offer nation-wide courses, open to selected students from all the universities (recommendation 3.1 of the general report and recommendation 8 of the TAU report).

The idea of nationwide courses is very attractive. Such courses would make better use of faculty resources, who would teach more and better qualified students in their advanced courses. They would also enable students to study with leading experts from all of Israel's universities, not to mention the possibility of bringing in some top visiting lecturers from abroad.

The department chair at Tel Aviv University initiated a meeting with the chairs from Hebrew and Haifa Universities to discuss implementation of this idea. The three department chairs all support the idea of nationwide courses. They are currently

gathering information about similar programs and intend to develop a plan to begin such courses. Our department chair also spoke about cross-university courses with one of the faculty members at the Technion, who greeted the idea with enthusiasm.

The committee suggests that we act to establish a National Statistics Research Center, along the lines of Eurandom in the Netherlands. A national research center could be a focal point for statistical research, including theoretical and applied aspects of statistics. Faculty members could be encouraged to take Sabbaticals at such a center and it could serve as a source for funding post doctoral fellows. Alongside these potential benefits, we are concerned that a national center might develop into something of a "meta-department", attracting the most dynamic research in the field, with negative consequences for the existing academic departments. If the center is set up at one of the universities, this might make it very difficult for the other universities to attract strong young scholars.

We will discuss the proposal for a National Statistics Research Center with our colleagues around the country during the coming academic year. Cooperation among all the current academic statistics units in Israel will be required to act on this proposal, as well as some seed money from the CHE. Consequently careful planning will be needed to successfully launch a national research center.

Service Courses

Our department has an extensive teaching burden across the campus at Tel Aviv University. We teach basic statistics and probability courses to students in engineering, life sciences, social sciences and natural sciences. Recommendation 3 in the TAU report states:

3. "The Department should receive the appropriate resources and recognition for its service courses, and it should make an effort to have a stronger involvement of its faculty members in those courses."

In the general report, the committee adds: "Most Statistics departments teach service courses for other departments. These classes are growing in size and are affected by the lack of resources. Credit for these courses also impacts quality, particularly since the teaching resources of faculty members are strained."

We agree with the committee (general report) that "it is educationally sound for statistics courses to be taught by statisticians." We will continue to teach these courses at Tel Aviv University.

The committee's concern about resources and recognition for service courses relates to the funding arrangements at Tel Aviv University, in which remuneration for service courses is at the level of outside instructors, even if a full professor teaches the class. Consequently, the teaching and supervision of service classes is a burden on the department's human resources while providing no benefit to the department in return. Efforts made by our faculty members to declare service courses as belonging to the department that teaches them, rather than the department whose students participate in them, have been ongoing for years. During the last eight months a renewed initiative

in this direction has taken place and is potentially an important step toward ameliorating this situation.

The reduction in the size of the faculty has strained our ability to be directly involved in teaching service courses, improving them, or even supervising their quality. The last two years regular members have taught 3 outside courses and this is the level planned for next year as well. We will follow the committee's suggestion to increase supervision of our service courses. However, we currently have to rely on the good will of one of our retirees who has agreed to supervise the introductory courses taught to economics students, while other faculty members are assigned to other disciplines. The University leadership must recognize that the responsibilities and commitment to the quality of statistical education throughout the University requires appropriate resources.

Our Graduate Programs in Statistics and Operations Research

The committee makes a number of comments regarding our graduate programs. These are related to attracting students, to funding them and to the breadth of our course offerings. The need to replace many faculty members (throughout the Israeli university system) in the coming years led the committee to specifically recommend that:

4. "All efforts should be made to increase the number of PhD students interested in academic careers."

We agree with this recommendation.

In passing, we note that three of our young faculty (Prof. Abramovich, Dr. Yekutieli and Dr. Rosset) are graduates of our program. Other TAU graduates have gone on to academic careers at the Technion, Hebrew University, Haifa University and Ben Gurion University.

The committee comments on the fact that many of our graduate students did not begin their studies in B Sc statistics programs (page 10). This issue also relates to concerns expressed by the TAU administration that the low enrollment in our B Sc programs would not provide a sufficient flow of graduate students (page 6). The committee notes that other paths to graduate programs in statistics (and we would add operations research, as well) are both common and healthy.

In writing about our M Sc programs, the committee urges that "more funding should be provided to these students". This would clearly be helpful and we agree with the committee's assessment that this would lead to students completing their M Sc degrees more quickly.

With respect to course offerings, the committee writes that "the mix of courses is good, but, as is the situation in all Israeli Statistics departments, limited in breadth, at least in comparison to leading US departments. The underlying cause of this is the limited size of the faculty." The committee's primary proposal for extending course offerings is to establish nationwide courses, as discussed earlier in our response.

Our B Sc Programs in Statistics and Operations Research

Although the committee did not make any specific recommendations regarding our B Sc programs, we would like to respond to several of the issues that were raised.

The most important of these issues is in Section 2.1.4. of the general report. The committee observes that "there is an implicit metric that the health of a department is measured foremost by the number of students it teaches." The committee is critical of this metric, pointing out that it has a number of negative consequences and can compromise the quality of study programs.

We would go further, as clarification, to note that this implicit metric is tied to the number of students in the department's degree programs rather than the number of students it teaches. Our department actually teaches a very large number of students via the service courses that we offer to other departments. As we noted earlier, full recognition and credit for our broad teaching load is essential.

The report on TAU notes two issues related to the number of undergraduate students in our own degree programs (page 9). First, the report points to the increase in enrollment for the 2009-10 academic year. We are pleased to see that enrollment for 2010-11 is comparable and hope that we again exceed 40 beginning students. Second, the report notes the rather high attrition of students from our B Sc programs and the need to investigate its causes. We have begun to contact students who began to study this year but did not continue in second semester. We hope that their answers will be helpful to us. A similar effort was conducted one year ago but most students reported that they left the program for personal reasons, without providing constructive feedback.

The committee notes (page 10) two areas where an increase in resources would benefit the B Sc program. They point to the need for more frequent course offerings and to grade homework assignments. Grading was standard practice until budget cuts forced a reduction several years ago. We agree that grading is important feedback and should be provided for all B Sc courses.

Terms of Duty for Chairs

The committee recommends that:

5. "Departmental (and School) chairs should be encouraged to serve double terms, for a four year total."

The official term for the head of the school is four years. We agree that individuals should be encouraged to serve a full term, or at least a three-year term. The official term for the department chair is two years. The current department chair (Prof. Steinberg) will assume responsibilities this fall as the head of the school and so will end his term after two years.

The Statistical Laboratory

In their general report (recommendation 3.6), the committee comments on the importance of the Statistical Laboratories, both as a basis for courses that are focused on applications and as a source of expert consulting to the wider research community. The committee highlights the need to stimulate the activity and contribution of the laboratories at all the universities that were visited. With respect to Tel Aviv University, in particular, the committee recommends:

6. "The University should provide seed money to restore the statistical laboratory to its former glory."

The recommendation comes in response to our report, in which we noted the cuts that have taken place in the Laboratory staff and the resulting reduction in its ability to take on new projects. We also noted that the reduction in the number of faculty members has made it increasingly difficult to supervise the Laboratory.

We developed a plan three years ago to enhance the Laboratory. The most important element of the plan was to hire a full-time director at the Ph D level who would supervise the Laboratory, attract consulting projects and teach courses that were built around those projects. The university did not agree to the plan. We will renew efforts in the coming year to obtain support for the plan from the TAU administration.

Alumni Association

The committee writes that:

7. "The Department should do a better job of maintaining contact with its alumni, and try to involve them more in its activities."

We agree that we can benefit from developing an alumni association. To begin the process, we are assembling a list of names and emails of our graduates, in particular at the M Sc and Ph D levels. We want to keep our graduates informed about what is happening at the department and to set up at least one event per year targeted at our alumni.

Recently we ran a program for our current B Sc and M Sc students on "what statisticians do" in the work place. Several of our alumni presented short talks and were very pleased at the opportunity to return to TAU and meet with the students. We intend to expand this initiative next year, perhaps running 1-2 such meetings each semester, with fewer, but more in-depth, presentations by some of our alumni.

Support Staff

The committee applauds the work and spirit of our support personnel (page 12), but is severely critical of the level of staffing, stating that "they are badly understaffed". The general report (section 2.4) notes that TAU lags behind the Hebrew University, and especially Haifa University, in providing adequate support staff.

We join in the compliments to our dedicated and professional support staff. Clearly any possibility to enhance the current level of staffing would contribute to the success of the department and the school.

Library

The committee emphasizes (page 12) the need to increase funds for the library to permit the purchase of new books. In recent years much of the funding for purchasing books has been contributed by individual faculty members from their research grants. We agree with the committee that better funding must be built in to the library budget.