

**“KISC” AND “CODAK”: AN INDIRECT YET EFFECTIVE WAY
OF PROMOTING STATISTICAL THINKING
AMONG THE GENERAL COMMUNITY
OF STUDENTS AND TEACHERS**

BY

**HABIBULLAH, SALEHA NAGHMI
HEAD OF THE STATISTICS DEPARTMENT
KINNAIRD COLLEGE FOR WOMEN, LAHORE
PAKISTAN**

ABSTRACT

The Kinnaird Inter-collegiate Statistical Competition (KISC) and the Competition Of Data-Analysis At Kinnaird (CODAK) are two initiatives of the Department of Statistics at Kinnaird College for Women, Lahore which invite undergraduate students to carry out small-scale data-based studies and to present their findings in the form of colourful and attractive posters. KISC and CODAK thus culminate in a beautiful exhibition of statistical posters which contributes to the promotion of statistical thinking among the general community of students and teachers. The significance of such an activity is better understood keeping in view the fact that the educational system of Pakistan is highly textbook-oriented, and there is very little emphasis on the inter-disciplinary approach.

I INTRODUCTION :

The prevalent system of statistical at the undergraduate level in Pakistan carries the old tradition of the ‘conventional lecture’ format and the textbook-oriented approach. Passive acceptance of statistical definitions and techniques motivates students to indulge in rote-learning rather than a proper understanding of statistical methodology. (See {4}.)

Eversince 1985, the department of Statistics at Kinnaird College for Women, Lahore has been engaged in projects and programmes aimed at the improvement of statistical education in the country ({1},{3}). These include (a) sample surveys carried out by teams of undergraduate students under the supervision and guidance of teachers ({2},{9},{10},{14}), (b) statistical competitions for students of various institutions ({5}, {8}, {13}), (c) award-schemes for teachers ({6}) and (d) workshops for teachers of statistics working in various intermediate and degree colleges of Pakistan ({7}, {12}).

This paper focuses on KISC and CODAK --- two competition which contribute not only to a better and deeper understanding of statistical methodology among the students of statistics but also to the promotion of statistical thinking among the *general* community of students and teachers.

The following sections of this paper will present (a) a brief history of the development of KISC and CODAK, (b) an overview of the types of posters that are received, (c) methodology for the evaluation of posters, and (d) feedback received from students and teachers who have visited KISC and CODAK exhibitions.

II A BRIEF HISTORY :

The Department of Statistics at Kinnaird College for Women, Lahore began its endeavours for the enhancement of statistical education in May 1985, when the author invited her BA/BSc final year students to carry out a sample survey at the college. Subsequent to three successive years of comprehensive statistical surveys on topics of common interest, in 1988-89, the Kinnaird College Statistics Department carried out a project that culminated in a Statistical Exhibition --- an endeavour which was probably the very first of its kind in Pakistan.

A year and a half later, the author was able to present this work at the Third International Conference on Teaching Statistics (ICOTS 3) (Dunedin, New Zealand, 1990). The paper stimulated a lot of interest and, subsequently, the author was invited to act as one of the international judges for the All New Zealand Schools Statistics Competition. Careful study and evaluation of colourful posters prepared by students of various schools in New Zealand inspired the author to launch an inter-collegiate competition in the city of Lahore.

Kinnaird's First Inter-collegiate Statistical Competition (KISC 1) was launched in the autumn of 1990 by means of a letter that was mailed to the Heads of the statistics Departments of about thirty colleges of Lahore, inviting them to organise teams of students who would carry out small-scale data-based studies and present their findings in the form of colourful posters. The fact that a total of only *two* posters arrived for KISC 1 motivated the author to launch a campaign for mobilization! During the autumn of 1991, the Kinnaird College Statistics Department Organised a Visiting Exhibition of statistical posters in thirteen different colleges of Lahore. KISC 2 was launched in December 1991, and the great deal of effort that had been made in connection with the Visiting Exhibition was amply rewarded when no less than 135 posters arrived for the competition!

The following years witnessed the expansion and development of KISC in various ways. Visiting Exhibitions were organised in other cities and towns of Pakistan by mailing parcels of posters to colleges that expressed interest; competition rules were mailed to hundreds of institutions of the country whereas KISC " Regular Category " was meant for students of FA/FSc/BA/BSc level, KISC " Special Category " was launched for MA/MSc students; whereas KISC " Ordinary Level " invited students to prepare statistical posters, KISC " Advanced Level " was launched in 1995/96 in order to motivate teams of teachers and students to carry out comprehensive surveys and to present their findings in the form of full-fledged *reports*.

From the very beginning, students of Kinnaird College had not been allowed to participate in the Kinnaird Inter-collegiate Statistical Competition. (Kinnaird is one of the premier institutions for undergraduate education in Pakistan, and its students do very well in various inter-collegiate, regional and national competitions. As such, it would seem quite awkward to present the KISC Trophy to the *host* institution.) In order to give Kinnaird girls an opportunity to exercise their data-analytical skills with a spirit of healthy competition, the Competition Of Data-Analysis At Kinnaird (CODAK) was launched in 1995.

Rules and regulations of CODAK are quite similar to those of KISC (" Ordinary Level "). Both competitions invite students to carry out small-scale data-based studies and to present their findings in the form of attractive posters. (For the Rules and Regulations of KISC 2000, see Appendix A.)

III AN OVERVIEW OF POSTERS RECEIVED FOR KISC AND CODAK:

Eversince the inception of KISC, students have been given total freedom of choice regarding the topics of their projects. As such, over the years, KISC and CODAK have attractev posters on a wide *variety* of topics ranging from frivolous items such as “ favourite dress ” to important issues such as “ narcotics addiction ”. A selection of socially significant topics is given below:

1. Reasons for not voting in the general elections.
2. Why are Crimes Increasing?
3. Our Standard of Education
4. Why Women in our Society take Divorce?
5. Cancer Aware?
6. Choice of Institution: Government or Private?
7. Is Signing of CTBT a Threat for Pakistan’s Survival?
8. Unemployment of the Educated Class
9. Child Labour
10. Inflation
11. Fundamentalism
12. Population Control
13. Afiat (Old Age House)
14. Women’s Role in Economic Development
15. Electricity and Telephone Bills

As indicated by the topics, a majority of the posters contain projects based on *qualitative* data. As far as the quality of students’ work is concerned, a comprehensive research-studies was carried out by the author and her team in 1993-94 in order to ascertain the quality of the posters received in connection with KISC 2. Analysis of the posters revealed that (a) only a few of the topics chosen were socially significant, (b) most of the analyses consisted of computations of proportions only, (c) a large majority of the postes did not contain the *source* of data, (d) for a sizeable majority of the posters, the conclusion was not drawn in an explicit manner. Another important observation was that a large proportion of the students did not have a proper understanding of the need for an appropriate sampling procedure (for purposes of proper statistical inference). As a result of this study, rules and regulation of KISC 4 were devised in such a way that they contained very *clear* directions regarding the need to choose a useful topic as well as the need to explicitly mention (i) the *objective* of the study, (ii) the *source* of data, (iii) the *analysis* of data, and (iv) the *conclusion*. This modification in KISC rules led to a *visible* difference between the quality of the posters received in connection with KISC 4 and those received in connection with KISC 2. In spite of this improvement, it is clear that there is a need to impart to the students a better understanding of the scientific method in general and of statistical methodology in particular.

As far as the CODAK posters are concerred, the author’s observations reveal that, by and large, these posters are *quite* similar to those received in connection with KISC. Many competitors are computing only percentages, there is no mention of the questionnaire in a number of cases, and there exists a tendency to draw conclusions on the basis of *personal* opinion rather than on the basis of data!

In spite of all these drawbacks, the overall effect of these posters is *positive*, and the statistical exhibition creates a *strong* and favourable impact on the students, teachers and other visitors.

IV EVALUATION OF POSTERS :

For each of the two competitions, evaluation of posters is carried out in two stages: In the first stage, about one-third of all the posters are selected by a 'jury' appointed by the Kinnaird College Statistics Department; in the second stage, pre-selected posters are sent to expert statisticians for final evaluation.

The jury as well as the expert judges allot marks to each poster according to the following weightage:

Topic:	15%
Logic:	70%
Attractiveness:	15%

Marks awarded to each poster by members of the jury / panel of expert judges are added in order to obtain the overall marks. This results in a decision regarding the winners of the First and Second prizes.

Eversince 1998, pre-selection of KISC posters is being carried out by a group of Kinnaird's BA/BSc Statistics Final Year students (those who excell in the subject) ({11}), whereas pre-selection of CODAK posters is being carried out by eight to ten faculty-members of Kinnaird College who teach subjects *other* than Statistics. Careful study of statistical posters creates in these teachers a better understanding of Statistics. This activity thus adds another dimension to the enhancement of statistical thinking among non- statisticians.

V FEEDBACK RECEIVED FROM THE GENERAL COMMUNITY OF TEACHERS AND STUDENTS :

Eversince the very beginning, feedback has been obtained from visitors of Kinnaird's statistical exhibition by circulating a proforma / questionnaire. Year after year, the overall response of students, teachers, parents and other visitors has been that of appreciation and approbation. A selection of the responses is given below:

- “ I like the exhibition of posters very much. It is very interesting and informative for me.”
- “Many of the students do not know about the pratical importance of their subjects especially Statistics, Economics and other subjects. By the use of these displays, we can help the educational system which is very unscientific and old.”
- “It is very very important for the mental growth of the students and it is very interesting and cheerful. I think it is very useul.”
- “I do appreciate some of the them s e.g. dowry, bride burning, etc. The students are definitely seized with varied and serious problems of life.”
- “A lot of hard work has been done --- some of the posters especially are really impressive.”
- “The exhibition is full of all types of posters. The posters are depicting many types of problems of the society. In some posters there are many spelling mistakes.”

- “Posters were very well-designed.”
- “ Organization of data and derivation of results is maningful and educational.”
- “The exhibition is very intresting as it gives a chance to students to contest the competiton an also lerned the application of statistics. My suggestion is that the drawbacks of a poster should be pointed out on the poster.”
- “ The posters were highly informative.It’s nice to see so many different aspects of life presented in such a systematic manner.”
- “Some posters are really good and worth seeing but some ‘statistical terms’ are used and some students like me could not understand them.”
- “The exhibition is quite impressive and well-organised. A great attempt to coordinate different colleges. We’ve really enjoyed it.”
- “ I don’t like this exhibition because there is no one to explain it. There are many things which I like but I don’t understand them, only I like them!!!.”
- “ The exhibition is very well-organised and interesting. The creative abilities of the students are remarkable. The coordination between teachers and students is also mentionable.”
- “ A nice way of helping in improving knowledge.”
- “ Good, informative, intriguing.”
- “ Very good effort. It shows the dedication to the cause.”
- “ Very creative work from students.”
- “ All the posters appeared neat; the themes (subjects) were several and unique; the amount of work put in the posters has given an idea of not only the interest, the labour and the aptitude and flair of the students but also the intelligence in deciding the topics to follow. The location was most congenial to the exhibition.”

VI CONCLUDING REMARKS :

The Kinnaird Inter-collegiate Statistical Competition and the Competition Of Data-Analysis At Kinnaird culminate in a beautiful exhibition which forms a vital part of the Kinnaird College Statistics FESTIVAL every two years. Undoubtedly, the students’ work is of an elementary level, and there is a need to train students for a *higher* level of data-analysis. Nevertheless, the exhibition has a *strong* and *significant* impact on the general community of students and teachers, and stimulates a lot of enthusiasm and interest. This biennial event thus contributes effectively to the promotion of statistical thinking among students and teachers of various subjects *other* than statistics, parents, and other people. The significance of such an activity is better appreciated when one takes into account the fact that, by and large, the educational system of Pakistan is pre-dominantly textbook-oriented, and there is very little emphasis on the inter-disciplinary approach.

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{2} Habibullah, Saleha N.(1990). "Survey-work to Enhance Understanding of Statistics in BA/BSc Students". Paper presented at the Second Islamic Countries Conference on Statistical Sciences (ICCS 2) (Johor Bahru, Malaysia, August 1990).

{3} Habibullah, Saleha N.(1992). "Efforts to Promote Project-Based Teaching of Introductory Statistics in the City of Lahore ". Paper presented at the Seventh International Congress on Mathematics Education (ICME 7) (Quebec City, Canada, August 1992).

{4} Habibullah, Saleha N.(1993). "Statistical Education in Developing Countries --- The Pakistani Scene". Proceedings of the ISI Roundtable Conference (Quebec, Canada, August 1992).

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{11} Habibullah, Saleha N.(1999). “Kinnaird Inter-collegiate Statistical Competition: Utilizing Student-Potential Towards the Process of Evaluation ”Proceedings of the Seventh Statistics Seminar of the University of Karachi (Karachi, Pakistan, March 1999).

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{13} Habibullah, Saleha N.(1999). “DATA: An Important Step Forward ”. Paper presented at the 52nd ISI Session (Helsinki, Finland, August 1999).

{14} Habibullah, Saleha N.(1999). “KISC 7 ‘G Level’: An Innovative Endeavour to Train Pakistani Teachers of Statistics Regarding the Conduct of Sample Surveys Within Colleges ”. Paper presented at the Sixth Islamic Countries Conference on Statistical Sciences (ICCS 6) (Lahore, Pakistan, August 1999).

APPENDIX A

KINNAIRD INTER-COLLEGIATE STATISTICAL COMPETITION (KISC 2000) RULES & REGULATIONS

1. ELIGIBILITY

The competition is open to the countrywide community of students (both boys and girls), and consists of two categories: (i) the Regular Category for students aged 16 to 21, and (ii) the Special Category for students aged 21 to 28.

2. PROCEDURE

Students can participate in this competition either individually or in the form of teams consisting of 2 to 4 students. Each competing student/team of students will be required to carry out a data-based project as follows:

- (a) Choose the **topic** of your study. (Students are advised to select topics which have some social significance/ importance/usefulness e.g. “NGO’s Role in Our Society”.)
- (b) Decide the **objective** of your study. (Exactly **what** is it that you are trying to find out? e.g. “To ascertain the extent to which educated people are aware of the contribution that NGO’s are making in our society”.)
- (c) Decide the **source** of your data. (Where/who are you going to get your data from? e.g. a random sample of adults from Model Town Lahore.) Your study should be based on **either** real, freshly collected/primary/unpublished data **or** secondary/published data.
- (d) Devise a **methodology for data-collection**. (e.g. interview method, questionnaire, publication, etc.) and collect the data.

- (e) Analyze the collected data. (e.g. determine the proportion of men and women who are properly aware of the contribution that the Non-Governmental Organizations are making in various areas for purposes of social uplift in our country.)
- (f) Draw **conclusions**.
- (g) Present your study in the form of a colourful and attractive **poster** of size 27" x 42" approximately. (Two chart papers should be pasted together to make one poster.) The poster must clearly present **all** the salient features of your study including (a), (b), (c), (d) & (e) above. The poster should be presented in the English language. The poster can be made pretty and colourful with the help of **suitable diagrams** (e.g. bar charts and pie charts) as well as **visual representations** of the topic (e.g. newspaper clippings, cartoons, etc.).

3. SUBMISSION OF ENTRY

The entry must reach Kinnaird College for Women, Lahore by Tues 10th October, 2000, 12:00 noon at the latest.

4. PROCEDURE FOR JUDGEMENT:

Judgement of KISC 2000 will be carried out according to the following procedure:

- (a) For each of the two categories, all posters received by the deadline will be presented to a **"Jury"** who will allot marks to each poster according to the following marking scheme:

	Weight
• Topic of the study	15%
• Logic of analysis (this covers points b,c,d & f of item # 2 above).	70%
• Attractiveness of the poster	15%

- (b) For each poster, the marks allotted by all members of the Jury will be **added** in order to obtain the **overall marks**. In this way, the **best five to ten posters** will be obtained.
- (c) Expert statisticians/professors will be requested to ascertain the **first three positions** out of the best five to ten posters selected by the jury as mentioned in (a) above.

5. THE PRIZE DISTRIBUTION:

The Prize Distribution Ceremony will be held during the **KINNAIRD COLLEGE STATISTICS FESTIVAL** on Monday, 23rd October, 2000 (at 10:40 am). At this occasion:

- (a) A **Certificate of Participation** will be awarded to every participant.
- (b) For the Regular Category as well as the Special Category, each member of the winning team will be awarded (i) a **Shield**, and (ii) a **Certificate of Merit**.
- (c) The **Runner-Up Prize** will be awarded to the Second-Best Entry of each of the two categories.