

IIEP International Summer Course on Quantitative research methods for planning educational quality: 'A consumer's viewpoint'

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FOR the first two days of the International Summer Course we were thrown into the deep end of the research swimming pool! We were first shown the major steps to be taken in high-quality educational policy research projects and the internationally-accepted quality standards that were essential for each step. It very quickly became clear to many of us that the research proposals that we had been writing for our routine work at home were somewhat inadequate. Immediately following these steps, we were given a set of educational policy questions and asked to use computers to prepare data summarization tables and then to list the policy implications arising from these analyses. We did all calculations using the SPSS statistical software and a dataset for Namibian Grade 6 pupils (for which we had the questionnaires and the computer-stored names of the variables). By the second afternoon we were computing factor analyses with varimax rotations and then using factor scores to predict pupil reading literacy levels! The '*deep end treatment*', we were told, would stop at the end of the second day of the course and after that the pace would be slower. Well, it did not take long for us to realise that this was clearly an understatement of the course requirements because the pace of the course, the scope of the computer laboratory sessions, and the length of the

homework assignments increased steadily as the course proceeded. All of this effort was focused on giving the participants every possible opportunity to gain practical experience on using computer-based methodologies to integrate research with policy formulation and policy analysis.

Sample design for educational research

The sampling concepts of 'bias' and 'error' were explained carefully, but at a very rapid speed we moved from simple random samples onto two-stage sampling with schools being selected with a probability proportionate to size. Not only did we cover sampling theory, but we used computer programmes to draw national samples of schools and learned how to revise sampling frames to accommodate the creation of pseudo-schools. From this we moved to the computer-based weighting of the resultant samples to correct for disproportionality among strata. For these weighted data we used the PC-CARP software to calculate sampling errors for stratified cluster samples. This session was voted as extremely important and useful by the participants because many were faced with the practical problems of having to draw probability samples at the national level in their own countries.

Modern approaches to test construction

Several sessions were devoted to test construction (including enjoyable group work sessions spent writing test items for assessing pupil reading literacy) and the application of classical item analysis (using ITEMAN software) for test development, as well as Rasch scaling (using QUEST software) for large scale trialing and scaling. The advantages of Rasch scaling became obvious to all, although many of us thought that the interface for the QUEST programme should have been a little more user-friendly! The Rasch scaling was taken further in the construction of a reading literacy scale for five countries involved in the initial educational policy research project of the *Southern Africa Consortium for Monitoring Educational Quality* (SACMEQ). We were shown how to anchor the scale using a subset of test items that were completed by pupils in all SACMEQ countries, and then how to use different sets of test items designated as 'essential' by each country to build a common scale of reading literacy. One session using QUEST was also devoted to questionnaire and attitude scale construction and this was felt to be very relevant since many participants were responsible for a wide range of instrument construction in their jobs.

Managing and analyzing research data

Several sessions were devoted to the use of the IIEP's special purpose DataEntryManager (DEM) software programme for the purposes of computer-based data entry and data cleaning. Some participants were project managers and this aspect of the course made them aware of the tedious, painstaking, but necessary, work that is required in order to clean educational research data in a professional manner prior to the main data analyses. We were shown how the DEM software could be used to identify data entry staff who have high error rates, and we were also given an opportunity to learn how to write data validation statements to check for 'wild codes' and to intercept inconsistent data codes. A number of participants had quite high data entry error rates, which came as a surprise because in the past most of us had assumed that the data entry phase of a project was concerned with simple clerical work. For all participants this was the first time that they had received formal practical training in this key area of educational research.

Learning to apply the complex procedures involved in using SPSS software for merging files, disaggregating school-level data to pupil level, and vice versa, was both fascinating and challenging. The examples used to demonstrate these activities were excellent because they were small enough to complete by hand which gave us a better understanding of exactly what was happening when the same kinds of tasks were undertaken with computers.

Causal models for policy purposes

Using the SACMEQ data for Namibian Grade 6 pupils, the participants worked on the conceptualisation and construction of causal path models. This involved the preparation of justifications for constructs and paths between associated constructs, but also required a great deal of prelimi-

nary work using principal components analysis and partial correlation in order to select variables and build constructs. Participants learned how to use the PLSPATH software and then proceeded to test several causal models. Three groups prepared their own models and the lively discussion and debate that arose from a comparison of these models was both stimulating and enjoyable. We quickly learned that the construction of causal models in education requires a combination of psychometric skills, child development theories, a knowledge of classroom processes, and some artistic flair.

Special topics for educational planning

At three stages during the course, 'special sessions' were organized on topics that are important in modern approaches to educational planning. They covered: *project management*, *educational indicators*, and *attitude measurement*. The *project management session* required participants to complete a formal project outline (covering resources, logistics, budget, and timetable). The *second session* consisted of a lecture-discussion on current and future trends in the field of *educational indicators*. Finally a presentation was made on a *practical guide to the construction of attitude scales* which included having participants build, respond to, and then analyze, a scale which measured 'Participant attitudes to the IIEP Summer Course'!

Conclusion

When we first arrived in Paris, we were not quite sure how the content of the course would be of use to us in our daily work. However we were all in for a series of pleasant surprises because the course concentrated on practical knowledge and skills that were central to our work as educational planners and researchers. There was general agreement among participants that the course had *four* main features which ensured that participants gained maximal practical benefits.

First, we learned that the aims of an educational project must be very clear and also operationalized *before* a research proposal is written. All research design and implementation steps emanate from these aims and if they go wrong then the whole project will prove useless, no matter how well it is implemented in the field. *Second*, we learned that high impact studies in the field of educational policy research must be guided from beginning to end by a detailed and sensitive prior analysis of the policy concerns in the minds of those making the key decisions within ministries of education. *Third*, our introduction to the latest and best computer-based methods for conducting educational research was first class. *Fourth*, all research techniques covered in the course were supported by hands-on practice using computers and 'real data', and were linked to practical exercises that required participants to extract policy implications arising from the results of the analyses.

Despite the very hot weather during our three weeks in Paris, we worked very well together, both professionally and socially. We worked at such a pace and so intensively, that the three weeks seemed like less than one. Nevertheless, we left Paris with the feeling that we were a privileged few to have had this opportunity, and to have been guided throughout the course by such highly talented and experienced staff – a feature often lacking in many other workshops that we have attended.

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