There are various ways of collecting data based on predetermined ICT indicators. Of course, the most popular one is the use of survey questionnaires, fanned out to a representative sample of schools, school heads and teachers, either on a regular or one-off basis. Clearly, those done more regularly can track the behaviour of the indicators over time. Weaknesses in ICT implementation can be remedied in due course; new strategies in ICT implementation can be worked out and carried out, thus increasing the probability of success of ICT programmes and projects. The one-shot survey is more appropriate for a summative kind of assessment, in which we are more interested in finding out, for instance, the longer-term impact of ICT use.

Where the telephone system in a particular country is well developed enough that most homes have access and long distance calls are cheap, the telephone interview is a more cost-efficient method of data collection. For example, EURYDICE, Basic Indicators on the Incorporation of ICT into European Education Systems Project (http://www.eurydice.org/Documents/TicBI/en/FrameSet.htm) conducted Eurobarometer surveys over the telephone in 2001, covering a representative sample of school heads and teachers in each EU country. The questions put to the school heads were mainly concerned with their school ICT equipment and facilities, while those asked of the teachers included the use of computers and the Internet with their pupils (time spent using them, frequency of their use, reasons for not using them, etc.) and how ICT had changed the way they taught. Slovenia also made use of telephone interviewing as a method of data collection, augmented by public opinion surveys in person on a one-to-one basis (http://www.ris.org/). Data on information-telecommunication infrastructure, such as telephone, cellular phone and ISDN connections, number of Internet providers, backbone providers and the like were gathered from the telecommunication companies themselves (Details of indicators used in the above surveys are in Appendix I).

In Australia, the national monitoring of ICT skills and knowledge of students in Year 6 (aged 10-12 years) and Year 10 (aged 14-16 years) will be done by means of three-yearly sample assessments, commencing in 2005. Student outcome information is the focus of the reporting agenda. Assessment techniques should be innovative and model good assessment practice, and wherever possible, assessment materials developed for national sample assessments should be available for use by systems and schools. Collection and use of data for national purposes will in all respects conform to the guidelines provided in the report Data Principles and Protocols agreed by the PMRT and where performance in different years in a particular domain is the focus of measurement, a single domain scale should underpin measurements of student achievement. The assessment methods will include a mix of tests on paper and on line and performance assessment tasks with teacher assessment.

The study by Singapore to measure the effective integration of ICT in schools indicated that to gather accounts by various groups and individuals in the learning environment, both qualitative and quantitative methods were drawn upon, such as observations of IT and non-IT based lessons, face-to-face interviews with principals and IT co-ordinators, group interviews with students and teachers, questionnaires for teachers and students and samples of students’ work.
Internet-based surveys

Where there is a saturation of Internet connectivity in the country, that is, most of the homes, schools and offices are connected, use of questionnaires posted on the website of the institution/agency conducting the surveys can be an efficient method of collecting data on indicators. Furthermore, communication by emails between the respondent schools, school heads, teachers and even students will facilitate data gathering. Data entered into the web-based questionnaire can be automatically uploaded to the institution/agency’s computer server located thousands of miles away.

Notably, the UNESCO IITE survey met with some difficulties because the collection of data depended primarily on the efforts and contributions of heads of departments, senior specialists and the staff of national Centres of Informational Technologies in Education or Centres of Teacher Training, Retraining and Educational Support, who were not given any financial support, agreeing to work due to an official memorandum. Thus, many of the results were generated from experts’ estimates, rather than direct collection of data from teachers, students and schools.

Web-based self-evaluation tool

EnGuage, a new Web-based framework developed by NCREL in the USA (http://www.ncrel.org/engauge/), is a response concern regarding the ever-increasing investment in educational technology, by providing answers to three significant questions, to wit: What value does technology bring to the schools? How can our schools ensure a return on these investments? And why does technology work in some schools and not in others? EnGuage is a tool set designed to help schools and school districts use technology effectively for learning, teaching and managing.

The School Technology and Readiness (STAR) Chart (http://ww2.iste.org/starchart/) provides another web-based self-evaluation tool, providing schools with the information they need to better integrate technology. With STAR Chart online, multiple-choice questionnaire can be completed that will provide instant feedback. The Chart identifies and defines four school profiles ranging from the “Early Tech” school with little or no technology to the “Target Tech” school that provides a model for the integration and innovative use of educational technology. It is not meant to be a measure of any particular school’s technology and readiness, but rather is intended to serve as a benchmark against which every school can assess and track its own progress.

The STAR Chart can help any school or community answer three critical questions:

- Is your school using technology effectively to ensure the best possible teaching and learning?
- What is your school’s current education technology profile?
- What areas should your school focus on to improve its level of technology integration?

The method of data collection for ICT indicators will then vary from country to country depending on the spread of telecommunication use such as the telephone and the Internet. It will also depend on whether the existing M and E systems can still accommodate additional data collection tasks to monitor and evaluate ICT impact in schools. Additional variables based on ICT indicators can be integrated into the existing database system.