

Data-driven Information and Communication Technology Planning for Schools, Divisions, and Regions

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Introduction: The need for data in ICT planning

Data-driven decision-making refers to the gathering of information to guide educational planning. Data removes the emotion and guesswork from decision-making process and replaces it with quantifiable proof to rationalize educational programs. Without data, plans become random instead of focused and designed. Results are hit-or-miss instead of deliberate and intentional (American Association of School Administrators, no date).

In the United States, more and more educational agencies are beginning to recognize the need for and value of data. Many state agencies have begun to collect individual student records in order to program change, to help raise student achievement levels, and to rationalize fund distribution (National Forum on Educational Statistics, 2000).

In the Philippine context, the Department of Education (DepEd) launched the National Strategic Planning Initiative for ICTs in Basic Education as part of a systems-wide effort towards educational reform (Department of Education, 2005). Policies formulated at the national level echoed to the regional, division, and school levels. Offices at these levels were expected to formulate ICT plans consistent with these national policies.

The DepEd prescribed three parameters for assessing information and communication technologies (ICTs) plans: appropriateness, effectiveness, and sustainability (Department of Education, 2005). Appropriateness referred to the suitability of the technology for a given context. Effectiveness referred to the extent to which goals and objectives are realized. Finally, sustainability referred to the extent to which ICT-based projects can continue after initial project funding has ended. In 2005, a Foundation for Information Technology Education and Development (FIT-ED) team composed of Liezl S. Formilleza-Dunuan, Anna Leah F. Macalincag, Ma. Thelma H. Tan, Victoria L. Tinio, and this paper's author was tasked to assist several schools, divisions, and regions draft appropriate, effective, and sustainable ICT plans.

A fundamental part of this process was to guide the schools, divisions, and regions through the process of environmental scanning. An environmental scan is a detailed examination of the internal and external ICT (or related) resources of

a school, division, or region. The results of the environmental scan are measures of what an institution has or can get in order to reach set goals. Having established a baseline, organizations can plan steps that will take them from the baseline towards a realistic target state.

Data from an environmental scan can be used to identify an institution's strengths, weaknesses, opportunities and threats. These are directly related to appropriateness, effectiveness, and sustainability of a school, division, or region's plans. Internal resources that enable the institutions to attain their goals are considered to be strengths. New ICT equipment in a school laboratory are a strength. These resources enable the school to offer computer literacy or related classes for both students and staff. Without these resources, computer classes would be inappropriate and ineffective.

A weakness is an internal obstacle that hinders institutions from attaining their goals. If a school's computer laboratory is new but the teachers are untrained, this lack of training is a weakness. Weaknesses prevent appropriate and effective use of resources. ICT facilities without anyone to use them are wasted.

An opportunity is an external resource that can help institutions achieve their targets. For example, if a local college or university is willing to provide the school's teachers with training free of charge is an opportunity. If the school's teachers take advantage of the training, they can make better use of the school's ICT facilities. They can also echo the training to their colleagues, making the buildup of internal capabilities more sustainable.

Finally, an external hindrance is a threat. An example of a threat is obsolescence. ICT equipment becomes obsolete in about three years. To combat obsolescence, the school has to upgrade existing equipment or purchase new equipment. The problem here is funding. The school has to make plans to source the necessary funding to make their laboratory and ICT classes sustainable.

Identifying strengths, weaknesses, opportunities and threats helps schools, divisions, and regions identify and prioritize ICT plans. Given the scenario above, a school can source teacher and staff training by tapping nearby colleges' and universities' outreach programs. To address sustainability, they can consider converting the laboratory to a pay-per-use Internet café outside of school hours.

The remainder of this paper discusses the environmental scan's prescribed contents and explains the connection between the information and the organization's subsequent ICT plans.

Scope of and instruments for environmental scanning

The team chose to adopt a broad definition of ICTs that included radio, cassette tape recorders, television (includes video tapes, video disks and cable programming), as well as computers and the Internet. ICT uses covered both instructional and non-instructional purposes. Instructional uses referred to subject area content delivery; computer-based learning activities such as games, simulations, etc.; ICT mediated interactions among students and between students and teachers; ICT-supported research, as in the use of the Internet to learn about subject matter; and ICT-mediated assessments such as exams, quizzes, projects, and others. Non-instructional uses of ICTs were defined as the use of computers for administrative or classroom management functions such as accounting, record-keeping, school communications, lesson plan preparation, and so on (Foundation for Information Technology Education and Development, 2005a, 2005b, 2005c, 2005d, 2005e, 2005f).

For instrumentation, the project team examined several ICT survey forms and planning templates (National Computer Center, 2003 July 31, Second Information Technology in Education Study, 1998 September 15a, Second Information Technology in Education Study, 1998 September 15b). Based on these instruments, the team determined that the environmental scans should use a combination of survey forms and focus group discussions (FGDs). These instruments enabled schools, divisions, and regions to gather data regarding basic utilities, inventory of current ICT facilities extent of use of ICT facilities, attitudes towards ICTs, ICT skill levels, ICT needs and desired uses, and perceived obstacles to ICT use.

Basic utilities

An environmental scan should include a survey of available basic utilities, specifically electricity, telecommunication, cable television, and Internet service. These services determine whether a school, division, or region can actually support ICT use. For example, the availability of electricity is fundamental. If no electrical service is available, deploying these technologies is impossible. If electrical service is only available during certain times of the day or week, schools, divisions, or regions have to plan ICT-related activities around those times.

These services also determine the school's, division's, or region's level of access to digital content. The presence of cable television providers could give educational institutions access to educational television stations such as the Knowledge Channel. Cable service providers also sometimes have affiliated Internet service providers (ISPs) that offered broadband Internet subscriptions. In lieu of broadband access, telecommunications providers could make dialup services available.

Awareness of local Internet, cable, or telecommunication providers raises schools', divisions', and regions' awareness of special outreach programs these

providers support. These providers sometimes provide educational institutions with free service or equipment for a period of time.

Inventory of current ICT facilities

The school's, division's, or region's current inventory of ICT facilities is an important part of the environmental scan because it measures the quality and quantity of existing resources. These ICT facilities include but are not limited to televisions, radios, cassette recorders, VCRs, DVD players, computers, printers, CD readers and writers, scanners, digital projectors, and other devices.

Digital content in the form of VCDs, DVDs, VHS tapes, CD-ROM based materials and other non-print media and their corresponding subject areas are part of the inventory. This information indicates what subject areas already have rich resources and which ones need further investment.

The environmental scan should include current subscriptions to telecommunication, cable television, or Internet service and their associated restrictions. For example, a school may be availing of a one-year free Internet subscription. By the second year, though, the school would be expected to pay the subscription's full cost.

Issues and problems related to ICT facilities raised during the FGDs should be noted. Examples of these include difficulty in repairing old machines, limited budgets for computer upgrades, limited peripheral devices, limited access to digital content and so on.

Extent of use of ICT facilities

The environmental scan should record the extent to which the ICT facilities are used, for what purposes, by whom, and how often. There are instances when ICT facilities may be used solely for administrative purposes, e.g. paperwork, correspondences, and report-writing. In cases like these, users of ICTs are administrators and possibly faculty, but not students.

It is often the case that ICTs are used for computer literacy education. While these skills are valuable, the implication of this limitation is that these facilities are not used to support academics. It would not be reasonable to attribute improvements in academic achievement on ICT interventions.

It is also often the case that schools have very limited ICT resources. Consequently, students have limited contact with computers and peripherals. Some students, e.g. members of the school newspaper, are given more access than others. The school, division, or region has to decide whether they are satisfied with situations such as these or whether they would like these situations improved.

Faculty, administrator, and staff attitudes towards ICTs

Because technology implementations require political will and financing, key administrators and teachers play active roles in these programs (Anderson & Dexter, 2000). In particular, teacher attitudes towards and expertise with technology are the single greatest determinant of whether technology is used effectively (Christensen, 2002). The environmental scan should therefore take faculty, administrator, and staff attitudes into consideration. Personnel are said to have a positive regard for the technologies if they are generally comfortable in using the devices, if they see the devices as helping them become more productive, and if they take personal time to learn new things about ICTs.

ICT skill levels

ICT plans normally include a training component. The kind of training that the various personnel require is determined in part by the skills that they already have. The environmental scan should include an inventory of faculty, administrator and non-teaching staff skills. The inventory should detail what sorts of technologies they can use—from cassette recorders to computers—and how independently. For example, can school administrators send email independently or do they need assistance?

Technical staff is a special case. The environmental scan should consider not just their ability to operate the devices but their ability to troubleshoot, maintain, and repair the devices as well. For example, can a technician install new hardware or software? Can he troubleshoot a local area network or an Internet connection? These questions are important because they determine whether a school, division, or regional office requires external assistance to operate its ICTs.

ICT needs and desired uses

The FGDs are designed to uncover ICT-related needs or desired uses. This is the venue for faculty, administrators, students, non-teaching personnel, and technical staff to articulate how they would like to use ICTs in their work. These can then translate into opportunities for further ICT interventions. For example, Math teachers may want to use more Internet-based drills to enrich their classes. Araling Panlipunan teachers may want to show videos on Philippine or world history.

Catering to these needs may require additional hardware, content, and training. These items can be included in the school's, division's, or region's ICT plans.

Perceived obstacles to ICT use

Finally, the environmental scan should include perceived obstacles to ICT use. These refer to problems or issues that prevent ICTs from being used extensively or effectively in the school, division, or region. Examples include a lack of hardware or software, insufficient training, the absence of Internet connectivity, insufficient administrative support, insufficient technical support personnel, and so on. ICT plans must include ways to address these obstacles.

Issues that may arise during data gathering

Environmental scanning is not an easy process. Because so much data is required, some of which can be sensitive in nature, there are several issues that may arise. The first issue is that of manpower. Faculty and staff are already overworked. To conduct an environmental scan is an additional burden. This can be addressed with the hiring of contractual, project-based staff. However, the problem then becomes financial.

Reproduction, delivery, collection, and encoding of survey forms require funding. Expenses such as these are not normally covered by institutional budgets. Funding will have to be sourced externally. To address this issue, institutions may propose the environmental scan as a project in itself to a funder who is willing to support this cause.

Another issue is the reliability of the data gathered. For example, data on equipment is sometimes difficult to get because the personnel filling out the survey forms may not be well-versed with technical terminology. Self-reported data regarding personnel skill sets may sometimes be overestimates of actual skill levels. In cases like these, follow up interviews or visits may help validate self-reports.

Data analysis and presentation

Once the data is collected, the processing of the data can be a challenge. The data has to be encoded in either a statistical package or a spreadsheet. The encoding itself requires only basic computer literacy skill. However, for the analysis, it would be advantageous for the analyst to have some knowledge of basic descriptive statistics in order to make the data meaningful.

Findings can be presented in a variety of ways, e.g. as strengths, weaknesses, opportunities and threats; as case studies; or as reports summarizing the various sections of data gathered. What is essential, though, is that their implications on ICT planning are clear and that ICT plans are informed by these baseline facts.

For example, suppose that the data shows that the majority of teachers in a school want to learn about computers, that Principal is interested in ICTs, and that the town mayor is supportive of ICTs in schools. One possible plan is a teacher training proposal for submission to the mayor's office.

Suppose that a school identifies computer maintenance as an issue. Also suppose that a local non-government organization is willing to provide computer maintenance free of charge. The school can enter into a Memorandum of Agreement with the organization so that the school can avail of these services.

Towards better planning

The environmental scan is only one part of ICT planning. However it is an important aspect that should not be ignored. Environmental scanning provides schools, divisions, and regions with quantifiable data regarding current ICT resources, current usage of these resources, the attitudes and skill sets their people possess, perceived needs, and obstacles that hinder ICT use. With this information in mind, it is hoped that the schools, divisions, and regions use of this data to formulate appropriate, effective, and sustainable ICT plans.

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