Michal Beller
National Authority for Measurement and Evaluation in Education

What Are Educational Indicators and Indicator Systems?
“…the overriding purpose of indicators is to characterize the nature of a system through its components – how they are related and how they change over time. This information can then be used to judge progress toward some goal or standard, against some past benchmark. Or by comparison with data from some other institution or country.”…

Shavelson et al. 1991
What Are Education Indicators?

Definitions vary:

- Indicators are statistics that reveal something about the status, health, quality or performance of the education system and describe its core features (Shavelson et al. 1997; Burstein et al., 1992; Wyatt (1994)).

- Statistics qualify as indicators only if they serve as yardsticks in some way (Shavelson, 1997).

- A defining feature of an indicator is that we should be able to interpret changes in the indicator as clearly as being good or bad (Cave et al., 1997). Indicators are inherently evaluative rather than merely informative in nature. This is because indicators are supposed to measure progress towards desired outcomes.

- A quantitative measure that summarizes an important feature of the system (Brain Stecher. 2005).
Types of Indicators

- All indicators should imply a point of reference or allow comparisons to be made – over time, or with standard (norm, average, or benchmark), a goal, or another organization (Atkinson et al.)

- In reality many indicators are more descriptive than normative

- Indicators may be either single statistics (e.g., the mean student achievement on standardized tests) or composite statistics formed by combining two or more related variables (e.g.; ratios)

- Indicators could incorporate also qualitative assessments
Many of the underlying properties and concepts in education are not easily or directly measurable.

Consequently, we will sometimes need to use several statistics, some of which may be proxies, to measure a particular concept.

It is therefore useful to distinguish between the following factors:

- The underlying concept we want to know about
- The variables which best reveal the concept
- The data sources available to measure those variables

Given this distinction, indicators may be said to have both a conceptual definition and an operational definition (Rumberger, 1994)
Indicator Framework

- Education indicators only have value or meaning as part of a set or system of indicators.

- Change in a single indicator, can rarely, if ever, be accurately interpreted without information on related variables.

- In order to avoid being an ad hoc collection of statistics, an explicit system or framework is needed.

- Indicator frameworks are typically developed on the basis of themes, goals or enduring issues of the system under consideration (NCES, 1991).

- Models are useful because they ensure that the indicators selected are comprehensive enough to adequately describe important dimensions and explore relationships among elements. However, we need to be careful not to make unwarranted casual interpretations based on the model (Nuttall, 1994; Burnstein et al. 1992).

- Building a framework will be an ongoing and iterative process. Provisions should be made to allow the set of indicators to be refined over time.
How to Choose Indicators?

- There are problems with having too many indicators, and with having too few. What is the correct number?

- The OECD’s approach suggests that the indicator set should be as small as possible, but as large as necessary for it to be useful for its purpose.

- Ruth Isaac et al. identified a number of principles that should assist in selecting performance indicators:
Criteria for Choosing Individual Indicators

- Relevance (to goals and stakeholders)

- Analytically sound and accurate (sound, rigorous, based on high quality data, provide accurate representation)

- Interpretability and transparency (easy to understand by a broad audience, known limitation should be transparent, most should have normative interpretation)

- Ability to disaggregated (potential to be disaggregated along relevant dimension to show differences between sub groups)

- Consistency over time (indictors should have consistent definitions and be able to be measured consistently over time)

- International comparability (be consistent with international indicator programs to enable international comparisons where fit)

- Feasibility and timeliness (indicators should be able to be collected and analyzed cost effectively, and provide current information in a timely manner).
What Indicators Can Do?

The expectation for social indicators are now quite modest:

- To describe and state problems more clearly
- To signal new problems more quickly
- To obtain clues about promising educational programs
Information about system performance is critical for effective educational governance.

The information currently available to govern the educational system is inadequate, particularly for the increasingly important tasks of promoting school improvement. It is primarily of two types:

- Information about inputs (including such things as building safety, library holdings and teacher certification).
  - Used primarily for the purpose of accreditation
- Information about outcomes (including such things as student achievement, graduation rates, and college attendance).
  - Used primarily for the purpose of accountability

Neither is sufficient to meet current needs for improving performance of our educational system.
Process Indicators

- Both type of indicators have shortcomings:
  - Input indicators do not push improvements beyond the *basic* level
  - Outcome indicators might be too *narrow* in scope (e.g., it might be unfair to judge schools on the bases of student achievement alone). Also, they provide little or *no guidance for improvement*.

- Process indicators address the two limitations of outcome indicators:
  - Provide better picture of the *quality* of services
  - Provide better information for programs *improvement*
Health Care Experience

- Healthcare experience offers a road map for developing a process-based quality improvement system for education

- The current emphasis on scientifically based practice in education lends support to such a development effort

- An example will be: collect information on early literacy instruction and identify the extent to which students were participating in the kinds of reading and writing activities found to be effective
Challenges

- There are many challenges to be overcome to develop such a system, and a complete process indicator system for education will not be created overnight

- Some process quality measures for education can be added to our current educational data systems without 50 years of additional research

- Information about processes could enhance educational governance and policymaking

“Outcomes can not be changed without changes in processes” (APQC,2004)