

Assessment for classroom learning and action: A framework for planning a school improvement program

Kathryn M. Tan
Jennifer B. Santos

Center for Educational Measurement, Inc., Philippines

This paper will present a preliminary framework for planning a proposed program that includes: (1) a testing and data utilization component for identifying student learning needs and measuring achievement, and (2) intervention components for teacher-level factors affecting students' acquisition of knowledge and skills in the classroom. A core feature of the program is the use of assessment to inform improvement efforts at the level of classroom learning. Such a feature raises important questions on how assessments can be used to inform instruction and professional development decisions. These issues were identified by the framework and steps will be proposed on how to address them.

The construction of this framework has been guided by current evidence on what contributes to student learning and effective training and teaching practices, as well as current views on the role of assessment in teaching and learning. It will serve to guide planners in assessing current capacities, identifying future directions, and planning cyclical monitoring for program enhancement.

Introduction

Amidst the political and economic crises, Philippine Schools continue their attempts at school improvement. Members of the academic community, legislators, researchers, and other stakeholders exert much effort in uplifting the quality of Philippine education through the utilization of both human and material resources. Often, upgrades in facilities, procurement of instructional materials, updating of teaching strategies, and rotation in teaching assignments are done to enhance the *more tangible elements of the educational process*¹. While these basic enhancements are, indeed necessary especially for a developing nation like the Philippines, assessment methods are also needed to sustain school improvement efforts and bring about changes in student learning.

In response to this need, the Center for Educational Measurement (CEM), Inc., a non-stock, non-profit private organization assists schools with their assessment requirements by providing educational testing and research services. The Center's testing products and services comprise 60 tests on subject area achievement, aptitude for higher level academic work, and aptitude for and interest in various occupational fields. It also provides complimentary ancillary instructional and advisory seminars on test interpretation, data utilization and homeroom guidance. In 2004, a host of teacher and professional development programs were introduced to complement the testing products and services.

In view of the Center's main advocacy to help improve the quality of formal education in the country, our current effort is to integrate these various products and services into a series of activities that coherently contributes to student learning. To do this, we will present a preliminary framework for planning a proposed Professional Development (PD) program focused on improvement of classroom instruction. It highlights testing and data utilization components for identifying student learning needs; and intervention components to help teachers address student knowledge and skills acquisition concerns. The role of other intervening variables such as support mechanisms and student-related variables are briefly discussed.

Additionally, the framework helps planners "think out" the proposed program by (1) identifying the basic components needed in the proposed program; (2) examining needed

components vis-à-vis available components; and (3) determining next steps. Consequently, in thinking out these plans, issues and concerns are surfaced. In this case, questions on assessment and data utilization are raised to further assist planners in the design of the framework.

The succeeding sections discuss the preliminary framework in greater detail.

Framework for planning a program on improving student learning

Components of the framework

Equating school improvement with student learning highlights the classroom as an important locus for intervention efforts. Indeed, research demonstrates that there is considerable variability in student achievement across classrooms, both within and across schools². The most obvious inputs to these differences are teacher factors. Teachers are largely responsible for students' opportunities to acquire and practice skills in the classroom. They shape 'what' and 'how' lessons are delivered to students through the quantity (i.e. extent of exposure to important content) and quality of their instruction. In the Philippines, teacher quality is varied. Thus teacher professional development is a crucial strategy for school improvement.

What teacher skills should be the focus for training? Studies on the components of teacher effectiveness have identified a number of variables, which we organized for ourselves into (1) teacher practice and (2) teacher cognitions. Under teacher practice, important aspects we considered were how teachers design lessons, deliver instruction, and manage the classroom. Under teacher cognitions, important aspects we considered were instructional goals, content and pedagogical knowledge, and beliefs about learning and teaching³. We made a distinction between teacher thinking and practice because the former is really the most directly influenced by in-service training, often assumed to translate to changes in practice although research does not always demonstrate this.

Further, we considered student assessment as an activity embedded in lesson design and delivery. It is an "enabler" of the teaching learning process, facilitating changes to lesson design and delivery through continuous monitoring of what students know and are able to do, and planning or adjusting instruction accordingly. Indeed studies have shown that assessment influences what is taught and how it is taught^{4,5}. Thus it is a skill that should be developed with training.

But for learning to be optimal, students must be able and willing to profit from classroom experiences to which they are exposed⁶. Evidence shows that learner characteristics like prior ability are almost always the strongest predictors of student achievement^{7,8}, while willingness to take advantage of learning opportunities in the classroom (i.e. motivation) have unique contributions to achievement even after effects of background factors and aptitudes have been controlled. Other important variables that learners bring with them into the classroom include self-regulation skills and their exposure to learning opportunities outside the classroom. We considered learner characteristics and contexts as important components of a model linking teacher training with student learning because these are important determinants of learning, sometimes more so than any other variable.

Putting all this together, our resulting framework for linking teacher professional development with student learning in the classroom incorporates teacher and student variables and is illustrated in Figure 1.

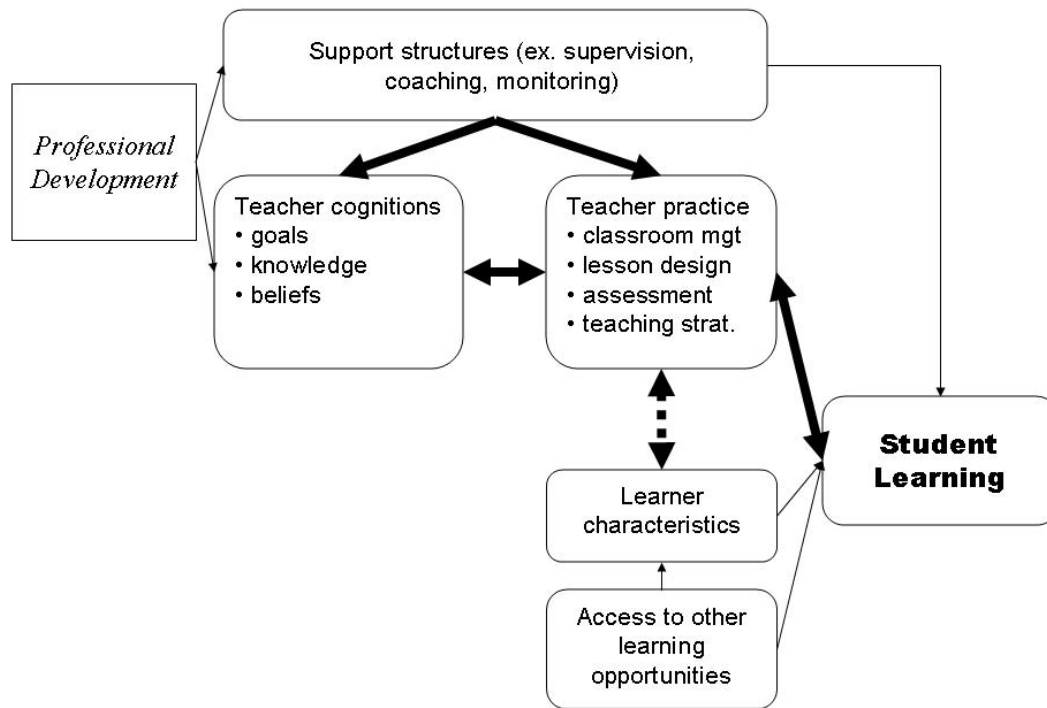


Fig. 1 Framework linking teacher professional development with classroom learning

Briefly, this framework illustrates that teacher professional development activities target short-term outcomes such as teacher goals, knowledge and beliefs. For training effects to cascade to changes in instructional practice, teacher thoughts about learning are expected to influence actions in the classroom. Reciprocally, actions are also expected to influence cognitions through self-reflection and self-assessment, with teachers adjusting goals, knowledge and beliefs about their students based on what they see happening in the classroom. For both teacher cognitions and actions, assessment of student learning is expected to drive the change process. Assessment of student learning is also expected to focus teacher professional development efforts.

Support structures for classroom teaching (academic supervision, coaching, monitoring and evaluation) can also be avenues for continuous professional development of classroom teachers. With it, training becomes integrated into the routine activities of a teacher, allowing for greater possibility of coherent and relevant content that builds on the teacher's existing competencies.

However, as previously mentioned, an important caveat for targeting student learning through teacher professional development is the fact that the link is not direct, and factors like student and background characteristics, which are external to teacher training, are significant predictors that may contribute to achievement more than teacher factors. Alternatively, student variables may also influence teacher instruction, and vice versa. Other variables, outside the classroom but still related to the school, such as curriculum, school climate and resource availability may also affect student learning and learner characteristics.

Program requirements identified from the framework

Using the framework above, we identified requirements or desired characteristics for a program that targets student learning through assessment and teacher development. This is summarized in Table 1.

Table 1. Desired features of the program

ASSESSMENT AND DATA UTILIZATION
GOAL: Classroom teachers use assessment to monitor, scaffold, and evaluate student learning and progress. Teachers also monitor and improve their own instruction through assessment of student learning.
<i>1. Student assessments are aligned with learning goals.</i>
The form and scope of the assessment should match the teachers' instructional goals for students. This allows assessment to support student learning by guiding teachers on how to adjust instruction to respond to student needs.
<i>2. Student assessments draw on multiple sources to measure learning.</i>
Assessments must measure a range of learning outcomes to adequately represent the extent of students' skills.
<i>3. Student assessments drive teacher training.</i>
Learning goals measured by student assessments should be aligned with the kinds of student skills teachers are trained to develop. This makes assessment data meaningful for professional development decisions.
INSTRUCTION AND CLASSROOM MANAGEMENT
GOAL: Classroom teachers present subject matter content with appropriate difficulty and sequencing, using effective techniques. Teachers also encourage classroom behavior that fosters a positive learning environment.
<i>1. Training content is relevant to student learning needs.</i>
Teacher professional development should focus on particular approaches that work to develop specific student skills.
<i>2. Training process facilitates transfer from knowledge to practice.</i>
Structure and duration of teacher training should be adequate.

These features represent optimal inputs for achieving desired program outcomes. For assessments to inform teacher practice and professional development decisions, its format and content should be aligned with learning objectives for students. This ensures that the information provided by assessments is relevant to instructional goals in the classroom. And if we assume that teacher training is guided by student learning needs, as it should rightly be, then assessments aligned with learning goals would also provide meaningful information that can be used to shape the form and focus of professional development activities. This would help make teacher training activities relevant and coherent.

Alignment of current capacities with requirements of the framework

Table 2 presents a summary of the comparison of current program features with desired program characteristics. We discuss the portions on assessment and data utilization in greater detail below.

Table 2. Examination of current tools and activities against desired program features

Desired Features of Assessments:		
<i>Assessments are aligned to learning goals, are drawn from multiple sources, and inform teacher training.</i>		
Existing Resources	Current Status	Implementation of Desired Features
(Diagnostic Tests – DTs – standardized subject area achievement tests): Summative Tests	Aligned with national curriculum Reports learning achievements in terms of specific expressions of skills Measures a range of specific skills	Aligned with national curriculum Reports learning achievements in terms of broad and narrow skill descriptions Measures achievement of important learning goals (i.e. valued student skills) Aligned vertically
(Required Resource): Formative Tests	None	Item bank of formative assessment tasks Monitors progress toward valued learning goals (i.e. valued student skills) Measured skills align with focus of summative tests
Desired Features of Teacher Training:		
<i>Teacher training activities are informed by student learning needs, and delivered with focused content and effective processes.</i>		
Existing Resources	Current Status	Implementation of Desired Features
Data Utilization Workshops	Uses CEM DT data to identify student strengths and weaknesses Identifies possible reasons for student skills and plans action	Uses other evidences of learning Identifies possible reasons for student skills, assesses relationship with teacher skills, and plans action Monitored and evaluated long-term
Classroom Test Construction Workshop	Develops skills on constructing good tests	Develops aligned formative and summative assessment tasks / tools
Classroom Research Workshop	Tackles basic research procedures	Develops reflective practice
Professional Education Program Series (PEPS – workshops on instructional strategies)	Collection of teaching strategies Short-term	Focuses on teaching strategies that develop valued student skills Aligned with student assessments Monitored and evaluated long-term

The Center's assessment tools that are most relevant to classroom learning are the standardized subject area achievement tests, called the Diagnostic Tests (DTs). The content of these tests are based on the curriculum prescribed by the Department of Education, with additional content based on a survey of learning objectives among private schools. Results from these tests are discussed and interpreted in Data Utilization Workshops, which are one- to two-day affairs where teacher-participants are expected to outline an action plan based on the results of their analysis of the DT data.

To attain the desired characteristics of alignment between assessments and learning goals, we begin with the question, *"How can CEM summative tests (DTs) provide evidences of learning that can be related to schools' learning goals?"* To some extent, this issue is addressed by the current design of the tests. Their content is drawn from the learning outcomes set by the national curriculum, which all schools must follow. However, as schools are given the freedom to enrich this prescribed curriculum, then the prescribed educational objectives are articulated in as many ways as there are schools with their particular curricula. For DT content to be more easily matched against schools' educational objectives, it is proposed that learning competencies measured by the DTs be stated in terms of broad and narrow categories, similar to the distinction between benchmarks and their component skill statements, respectively. Doing so may facilitate determining alignment of DT content with schools' learning goals, as the combination of general and specific descriptions provide more information about the cognitive demands of the items. Also it may take the emphasis away from a potentially misleading analysis of very specific expressions of student skills. The provision of both broad and specific skill descriptors in the DTs may also facilitate the process of generating hypotheses, or uncovering possible reasons, for student learning weaknesses. This leads into another desired feature, which is for assessments to inform teaching and teacher training. Being able to explore possible reasons for results of student assessments is an important step to meeting this requirement. However, to obtain a complete picture of student learning, it is necessary to draw on multiple sources of data. This means that DT data in our Data Utilization Workshops must be supplemented by other sources of evidence for student learning. To help fill this need, additional tools may be designed and offered by the Center, such as formative assessment tools. Support programs may be established as well, for example, by redesigning existing workshops on classroom test construction and classroom research to serve the function of developing teacher skills in constructing aligned formative and summative assessments and in reflective practice.

But beyond all these, Table 2 shows that an important step in linking our assessment, data utilization and teacher training activities is to use a common set of essential student learning goals to guide the design of assessment tools and teacher professional development programs. This would facilitate alignment of the content and focus of our tools and activities, so that outcomes from each would support and build on each other. For example, student assessments and teacher training programs may be constructed around the learning objective of "developing understanding in students." Thus, assessment would test for student understanding and teacher training would focus on teaching strategies that develop student understanding.

Adoption of such goals would require careful consideration of what particular classes of student competencies can be measured by particular forms of assessment, how they will be assessed, and how the development of these skills in students can be taught to teachers. Also a challenge is identifying important learning goals that are similarly valued across different schools that have their own varied, specific expressions of educational objectives. There is a

need also to identify or develop expertise in additional areas needed, such as formative assessment and classroom research.

Next steps

There are many challenges that face us as we strive to bring our capacities close to achieving the previously outlined program features. We proceed one step at a time.

The current redesigning of the Diagnostic Tests offers an opportunity to establish links among these tests and the training programs. Initial steps can begin with revising the skill descriptions in terms of broad and narrow skills. Teacher trainers then need to be educated on these new tools, and perhaps the creation of new or redesigning of current training modules can be guided by the design of these new tests. Follow-up of implementation of action plans in the data utilization workshops are also being planned.

Conclusion

Planning for an improvement program is never an easy task, but we have to start at some point. In the development of this preliminary framework, many challenges and questions surfaced. And since they cannot be worked out all at the same time, it is good to keep in mind our priorities – what needs to be done first, why, and how. In this case, assessment and data utilization land on top of the priority list since these are where our capabilities are concentrated.

Fundamentally, the framework presented has shown that while some components/services are already in place, others are yet to be established, namely support programs and structures, such as training on formative assessment, reflective teacher practice and monitoring and evaluation mechanisms.

Most importantly, alignment of these components must be ensured. Doing so brings about a coherent program that more effectively leads to improved student learning.

References

1. Bernardo, A.B.I. & Garcia, J.A.S. (2006). *School Improvement in a Centralized Educational System: The Case of the Philippine Basic Educational System* (pp. 227-244) in School Improvement: International Perspectives Lee, J.C. & Williams, M. (ed.). Nova Science Publishers, Inc., New York.
2. Marzano, R.J. (2003). *What works in schools: Translating research into action*. Alexandria, VA: Association for Supervision and Curriculum Development.
3. Artzt, A.F. & Armour-Thomas, E. (2002). *Becoming a reflective mathematics teacher*. New Jersey: Lawrence Erlbaum Associates, Inc.
4. Crooks, T.J. (1988). The impact of classroom evaluation practices on students. *Review of Educational Research*, 58, 438-481.
5. Black, P.J. and William, D. (1998). Assessment and classroom learning. *Assessment in Education*, 5(1), 7-71.
6. Byrnes, J.P. and Miller, D.C. (2007). The relative importance of predictors of math and science achievement: An opportunity–propensity analysis. *Contemporary Educational Psychology*, 32, 599–629.
7. Jones, K. K., & Byrnes, J. P. (2006). Characteristics of students who benefit from high quality mathematics instruction. *Contemporary Educational Psychology*, 31, 328–343.
8. Corno, L., Cronbach, L. J., Kupermintz, H., Lohman, D. F., Mandinach, E. B., Porteus, A. W., et al. (2002). *Remaking the concept of aptitude: Extending the legacy of Richard E. Snow*. Mahwah, NJ: Lawrence Erlbaum.