Utilizing Test Results To Design Instructional Modules: The CEM Professional Education Program Series (PEPS)

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Abstract

This paper discusses the potential of utilizing test data to design instructional modules for the in-service training of teachers in the core subjects of the school curriculum. It documents a major effort of the Center for Educational Measurement (CEM) in developing and instituting a series of professional education programs, the PEPS, for teachers of English, Mathematics, Science, and Filipino, across ten grade levels of basic education in the Philippines.

The design of each module was based on patterns of academic strengths and deficiencies culled from an analysis of the results of diagnostic tests administered within five years to students of schools that participated in CEM's nationwide testing program. Results showed that areas with learning deficiencies in the lower grades tend to appear in the higher grades. The data served in prioritizing the contents and skills for which the first twenty modules were drafted. Other factors affecting performance were considered in the choice of strategies employed. Highlights of module development, as well as the initial implementation and evaluation of the training series are presented.

Why the PEPS?

One important lesson from the reengineering efforts to improve the system of education in the Philippines is the recurrent finding that teachers are the fulcrum that determines whether any school initiative tips towards success or failure. The quality of instruction in a school is the single most important factor affecting the quality of learning that takes place, the achievement of standards, the delivery of the curriculum, and the assessment of student progress.

The Center for Educational Measurement (CEM), a local private nonprofit assessment agency, has for many years led the private sector in developing standardized diagnostic instruments for schools nationwide. It has done this with the firm belief that educational assessment should focus on the effects of instruction and that data derived from reliable instruments could support and improve teaching and learning. The CEM has also conducted seminar-workshops with school test users to interpret their students' results and discuss action plans. In the process it has become increasingly aware of teaching-learning problems, the inadequacy of teachers' pre-service training and the need for continuing development programs in schools.

The CEM decided to look more closely into student performance in the core academic areas as a basis for the development of school improvement programs, particularly for teachers' in-service training. It is convinced that such programs should be guided by identified instructional needs and should provide opportunities for teachers to improve their strategies. In the year 2003 CEM organized an enhanced program for instructional seminars, the Professional Educational Program Series (PEPS), which is intended to respond to the need of teachers to increase their knowledge of the subjects and improve their teaching skills. The PEPS was meant to be more directed in focus, standards related, innovative and stimulating, and possessing the essentials of effective professional development (Hawley and Valli, 1999).

I. Analysis of Student Performance in Core Subjects

The first step undertaken in the development of the PEPS was to study the past performance of students in the four major academic subjects emphasized in the local curriculum, in order to provide a basis for the PEPS design.

Instruments. The CEM Diagnostic Tests (DT) are standardized tests in four subject areas, namely, English, Mathematics, Science, and Filipino, for each grade level in basic education (Elementary Grades 1-6, Secondary Years 1-4). In multiple-choice format, they measure performance in competencies taught in the local curriculum, have a unique form per level, test length, and time allotment. Each content area consists of item clusters, the number of which vary according to level. Developed under the classical test model, the instruments were normed on representative samples of students for each grade level subject (TDD-CEM,2002).

Sample. The DT's are used as external objective measures in many private schools in the country. Test data were derived from student examinees across five years, from 1999 to 2003. These are students from schools that subscribe to the tests voluntarily, thus the total sample sizes per level test vary, ranging from 7,606 to 19,167 in English, 5,638 to 21,383 in Mathematics, 6,302 to 17,505 in Science, and 695 to 3,928 in Filipino.

Scoring and Analysis. Each examinee's competency scores on the tests are summarized into percent correct scores on the specific content and skill areas and an overall percent correct score with its standard score equivalent. The mean score of the standardization sample or norm group served as the cut score for identifying weaknesses or areas of concern. Content scores that fell below this point would indicate areas where the examinees performed at a level below that of the average student in the norm group. These are to be identified as areas of concern, which would receive attention in preparing teaching modules.

Results. From the detailed analysis of the five-year data on the four subjects, the identified contents with means below the norm average were tabulated per subject and grade level. The mean scores for these content areas as well as the cut score for the norm group per level are given in each table.

1. ***English.*** An illustration of the outcomes in the English subject is given in Table 1a. The initially measured contents run across the grade levels, but only those with scores lower than the norm are reported here.

Table 1a.
Areas of Concern in English across Elementary Grade Levels

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Noun (48)					
Adjective (52)	Adjective (43)	Adjective (51)			
Verb (44)	Verb (50)	Verb (45)	Verb (46)	Verb (50)	
Preposition (54)		Preposition (48)		Preposition (42)	
					Verb (46)
		Sentence (38)	Sentence (48)	Sentence(52)	Sentence (47)
					Paragraph Dev't. (51)
		Structural Analysis (49)		Structural Analysis(58)	
			Vocabulary (40)	Vocabulary (52)	Vocabulary (49)
			Understanding a selection (45)	Understanding a selection (51)	
Sequencing Events (53)					
Norm (58)	**Norm (52)**	**Norm (52)**	**Norm (51)**	**Norm (59)**	**Norm (54)**

Note: Mean Percent Correct Score enclosed in parenthesis

It is noted that some contents in the Elementary English curriculum were poorly learned across the grade levels. The most commonly unmastered topic was that of *Verb*, from Grades 1 to 5, followed by *Adjective* and *Preposition.* As an apparent consequence, *Sentence* also figured as

difficult in the four higher levels, Grades 3-6, and *Paragraph Development* at Grade 6. Likewise, the *Vocabulary* difficulties in the higher elementary grades might have contributed to the weakness in *Understanding a Selection.*

The secondary level students showed weakness in *Tenses* and *Agreement between Subject and Predicate*. This reflects on the upper levels' not doing well enough in *Grammar and Usage* as well as in *Sentence* and *Paragraph Development*. It is also interesting to note the lower years' difficulties in *Vocabulary, Recognition of Main Idea and Details*, as well as *Inferring* and *Reorganization,* and the seniors' similar inadequacy in *Reading Comprehension.*

Table 1b.
Areas of Concern in English across Secondary Year Levels

Year 1	Year 2	Year 3	Year 4
Simple Tenses (48)	Tenses and voice (51)		Grammar and usage (36)
	Modal Auxiliaries (48)		
	Modification (51)		
Subject & Predicate Agreement (53)	Special Rules on Agreement (47)		
Sentence (49)	Sentence (52)	Reported Speech (51)	
		Paragraph Development (45)	
		Brevity & Parallelism (50)	
Vocabulary (48)			Reading Comprehension (54)
	Recognition of Main Idea & Details (45)	Recognition of Main Idea & Detail (43)	
Inferring (47)	Inferring (43)	Inferring (50)	
Reorganization (50)	Reorganization (42)	Reorganization (51)	
Norm (54)	**Norm (55)**	**Norm (52)**	**Norm (55)**

Note: Mean Percent Correct Score enclosed in parenthesis

2. Filipino. A similar process was done for the Filipino subject, where weaknesses were also observed across the grades (Appendix A). Pupils were deficient in learning the parts of speech in Filipino, the ability to handle sentences and word structure, likewise in vocabulary and reading comprehension skills. The secondary school students found difficulty in adverbs, phonology, sentence and paragraph development, and understanding of reading material.

Compared to English, however, the carryover to the secondary level was observed only in the first year students who showed difficulty in a number of competencies relevant to development of Sentence and Paragraph, as well as Vocabulary and Reading comprehension, and in two areas of second year, having to do with reading comprehension and study skills.

3. ***Science***. Some areas of concern in elementary science were on similar topics developed across the grades (Appendix B). Lower graders found difficulty in learning about *Plants*, *Human Beings*, and *Matter*, as well as *Light, Magnets* and E*lectricity*. The upper grades were weak in *Force and Energy* and *Weather and Climate*. But the most consistent and greatest difficulty in all levels was concerning *Earth and Space.*

The high school science subjects are specialized for each year level. However, the inadequacies in elementary science continued through the first year of secondary, with *Nature of Matter* and *Earth and Universe* not being mastered. Second year Biology, had a good number of inadequately learned topics, with the lowest scores in *Diversity and Adaptive Forms*, as well as *Heredity, Variation and Population.* Third year Chemistry also showed many areas of concern, with the lowest scores in *Chemical Kinetics*, *Electrochemistry*, *Phases of Matter* and *Symbols and Formulas*. In Physics the students needed more help in the topics on *Energy and Communication*, *Electromagnetic Energy*, *Force and Energy* and *Waves and Energy.*

4. ***Mathematics***. The Mathematics curriculum appeared to have been designed with a clearer map of learning competencies developed with continuity but increasing degrees of complexity along the basic education ladder.

Table 2a.
Areas of Concern in Mathematics across Elementary Grade Levels

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
	Numeration system (56)	Numeration system (43)	Numeration system (50)		
Sets(65)					
Money (60)		Decimals(32)	Decimals & Ratio (43)	Decimal & Percentage (45)	Decimal, Ratio, & Percentage (48)
	Parts of Whole Objects (56)		Fractions (51)	Fractions (34)	Fractions (42)
Subtraction (61)	Fundamental Operations (55)	Fundamental Operations on Whole Numbers (50)			
			Geometry (48)	Geometry (38)	
			Graphs, Maps, & Scales (47)		Graphs, Maps, & Scales (47)
Norm (72)	**Norm (59)**	**Norm (51)**	**Norm (51)**	**Norm (62)**	**Norm (57)**

Note: Mean Percent Correct Score enclosed in parenthesis

A good number of competencies in Mathematics were far from being mastered by the elementary pupils. *Numeration* and *Fundamental Operations* posed a problem in the lower grades, while *Geometry* and *Graphs and Scales* figured in the higher grades. But *Decimals* and *Fractions* remained consistently difficult across the levels.

Table 2b.
Areas of Concern in Mathematics across Secondary Year Levels

Year 1	Year 2	Year 3	Year 4
Factors & Primes (43)		Exponents and radicals (46)	Complex Number(38))
Rational Numbers (44)		Rational Expressions (35)	
Non-metric Geometry (46)	Geometry concepts (46)		
	Quadrilaterals (42)		
	Triangle Congruence (41)	Similarity (47)	
Language of Algebra (33)	Algebraic Expressions (46)		
Equations & Inequalities (34)		Quadratic Equations (44)	Circular Functions (40)
	Statistics (40)	Quartiles, Percentiles & Deciles (37)	
		Sequence (46)	
		Variations (43)	Linear Correlation (38)
Measurement (30)			
Norm (55)	**Norm (51)**	**Norm (50)**	**Norm (49)**

Note: Mean Percent Correct Score of the content is enclosed in parenthesis

The high school Mathematics competencies showed increasing complexity of some topics which started in the elementary level. *Number Concepts* reviewed *Factors and Primes* and included *Exponents and Radicals* as well as *Complex Numbers*. These the students found difficult. *Geometric Concepts*, *Quadrilaterals, Triangles* were not learned well either, and so with *Language of Algebra, Algebraic Expressions, Quadratic and Circular Functions*. The integrated curriculum included *Statistics,* where the students needed improvement. Understandably, they stumbled in learning the concepts of *Quartiles, Deciles and Percentiles*, *Sequence* and *Variations,* and *Linear Correlation* as well.

II. Development of PEPS Modules

A. Work Flow. Based on the findings of the analysis of core subjects, the CEM proceeded with the development of the modules for faculty in-service training, guided by the general flow of activities in Fig. 1. The instructional design itself followed the basic process suggested by Vinzon (2002) but included more details.

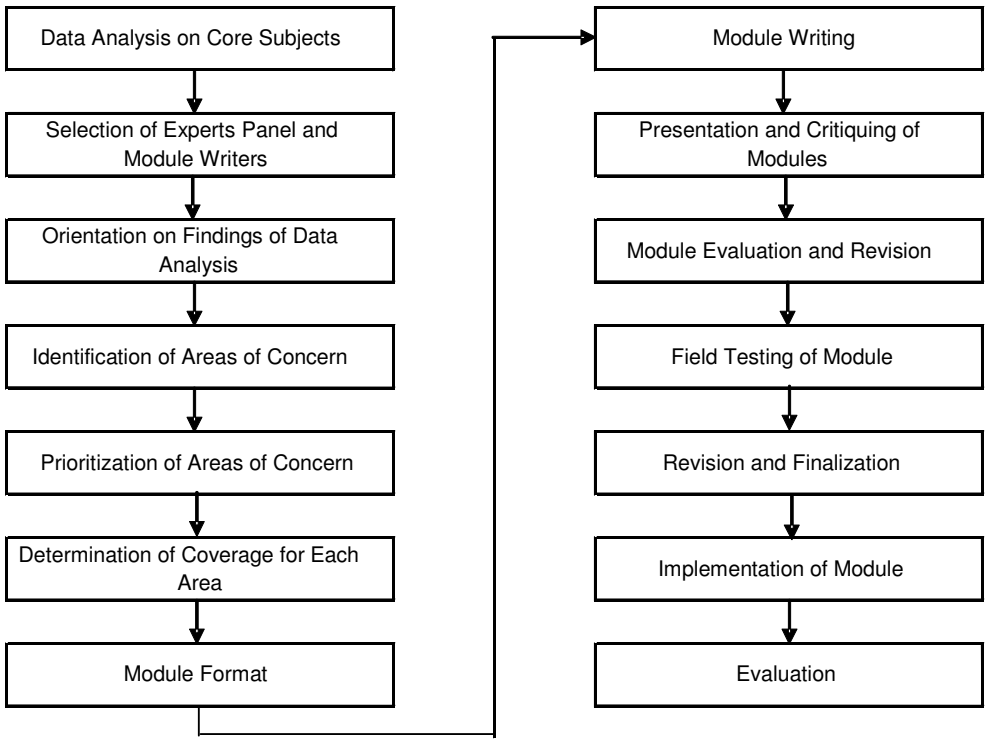

Figure 1. PEPS Module Development Flow Chart

B, Experts Panel and Module Writers. Educators noted for their experience in actual teaching, curriculum development, writing instructional materials, and conducting staff development programs for teachers, acted as consultants in the development of the PEPS. The experts panel, which included an education and curriculum supervisor, a faculty development director, and a measurement expert, provided guidelines for module development, monitored the production, and evaluated the outputs. The twenty (20) module writers, among whom were university professors, subject coordinators in basic education departments, and textbook writers, wrote the modules on specific topics. They were experienced teachers of the core subjects, conversant with current research, assessment, and the use of technology for instructional purposes. The experts panel and module writers worked in coordination with CEM, which provided them with the student performance data analysis.

C. Priority Topics. The discussion on analysis results posed a serious challenge to the PEPS consultants. The number of contents needing attention appeared formidable, so efforts had to be exerted in order to limit the topics to the most important as well as the most doable, within the resources available in most of the schools. They dissected the areas of concern for every core subject and their specific components in the syllabi, the score values in relation to other topics, the frequency of occurrence across levels, albeit in varying complexity, and their possible impact on other areas within the same subject and across disciplines. There was also the attempt to put together some areas in one module as long as they are closely related, not only in learning the subject but in application to real life situations.

An example of this discussion centered on *Reading Comprehension*. This is a larger strand which covers the areas of concern on *Vocabulary Skills*, *Scanning*, *Understanding Selections*, *Inferring* and *Reorganization*. A module could be built around this generic area, with specific time frame devoted to the components and variations done for different levels. The importance of *Reading Comprehension* is its impact on the other subjects in the curriculum. It is a skill that helps students hurdle materials they need to understand as they master the competencies in science, mathematics and other subjects.

The PEPS consultants worked on the priority topics for the first year of the program. They tried to target an equal representation per core subject, with each of the twenty module writers doing a topic of his choice. They finally arrived at the following 20 modules with the intended level of participants, ensuring that for each subject there were modules for the elementary and secondary levels.

Table 3.
List of Modules per Subject and Intended Participants

Subject	Title	Teaching level
English	Beginning Reading	Pre-school, Lower elementary
	Teaching Grammar and Vocabulary	Elementary, secondary
	Integrated Language Arts	Elementary, secondary
	Reading Into Writing	Secondary
	Reading Notes and Strategies	Elementary
	Literacy and Literature	Secondary
Filipino	Pagbasa sa elementarya	Elementary
	Wika sa elementarya	Elementary
	Wika sa sekundarya	Secondary
	Panitikan sa Filipino	Secondary
Science	The Physical Earth, its Weather and Climate	Elementary
	The Earth, A Special Place in the Cosmos	Secondary-Year 1
	Genetics	Secondary- Year 2
	How Molecules Behave; Laws Governing Gases	Secondary- Year 3
	Waves and Wave Properties	Secondary- Year 4
Mathematics	Number Theory and Rational Numbers	Elementary
	Elementary Algebra	Secondary- Year 1, Year 2
	Geometry and Measurement	Secondary- Year 3
	Congruence of Triangles and Properties of Quadrilaterals	Secondary- Year 3
	Special Functions and Sequences	Secondary- Year 3 & 4

D. The Module Format. During the workshop the experts panel and module writers arrived at the format which the PEPS modules would take and this would be applicable to all the core subjects they were working on. A module was set to run for five-days to a maximum of 25 participants. The allocation of specific content coverage and activities within the time frame should allow a more intensive treatment of the topic. The small group size was intended to maximize involvement of the teacher-learners. The basic elements of the module would be as listed in Figure 2.

Elements of PEPS Modules	
1. Introduction	A. Conceptual framework B. Goals/Objectives C. Uses D. Intended audience
2. Module Text	A. Expected learning outcomes B. Content C. Instructional techniques D. Materials and equipment E. Evaluation procedures
3. Appendices	A. Suggested readings B. Sample cases or lessons C. Glossary of terms
4. Facilitator's /Teacher's Guide	
5. Handouts/Worksheets for Participants	

Figure 2. Elements of PEPS Modules

E. Module Writing

It is evident from the required module elements that the writers wanted the PEPS to be an instrument in effective teaching. This would help the teachers deepen their knowledge of the subject, the student, and teaching practice. Effective educators should have clear expectations of learners' ability to achieve and use strategies to help them do this at the highest retention level.

Schools' inadequacy in facilities and management support have been cited as deterring factors to high student performance, together with often limited and fragmented instructional programs. On the teacher level, it was not rare to see a mismatch between teacher and assignment, lack of preparation in pre-service training, and more often, inefficient use of time and poor quality of teacher-student interaction in many classes (Taguiwalo, 2005).

Local teaching practice at the time of the study has been reported to be largely teacher-dominated, with high dependence on text guides, emphasizing recall rather than higher order thinking skills, and passive pupil behavior. It had little use of problem-solving techniques and group methods for cooperative learning and managing students' varied learning styles.

Aware of the situation of schools, teachers and students, the PEPS module writers endeavored to produce work that embodied desired approaches, theory and practice. The strategies employed in the modules were carefully selected for more effective learning of the competencies and adapted to the teachers as adult learners. The resulting modules would be characterized as:

Research-based : Aside from being needs-based, derived from results of student performance, the modules also encourage teachers to try strategies that have been found to work, contents that are in line with current theories and research in the field. They also employ technology in sourcing and delivery.

Constructivist/developmental in approach: The participants would be actively engaged in the learning process and integrate their new experiences with what they already know or are currently practicing in their work. There is emphasis on multiple sources of information, peer collaboration and student-generated questions (Edelstein, 1992).

Learner-centered: The needs of participants are assessed through a pre-seminar survey and the activities ensure individual participation and feedback, constant reflection on learnings. The activities are carefully chosen to stimulate interest and enjoyment, and to meet different learning styles. The limited number of participants allows for greater focus on individual needs.

Focus on metacognitive skills: The design exposes the participants to activities that develop higher order thinking skills. Even in the review of basic algorithms and language rules, concept mapping, identifying patterns, analysis, and creativity are emphasized.

Assessment-oriented: Pre-seminar and post-seminar assessment, written, oral, and performance types are employed to help participants gauge their knowledge of the topics. Student evaluation practices for the core subjects are also given attention.

Transfer of learning: Discussions on application to work, lesson planning, presentation, and critiquing help the participants improve their skills and be ready to use them in the classroom situation.

F. Presentation and Critiquing of Draft Modules. All the writers' products were presented to the experts' panel and were given critical evaluation as to whether they complied with the required elements and contained suitable methods and techniques for the topic. The module outlines were presented and discussed with the total group of writers. Portions of the module, such as activities crucial to learning particularly difficult contents, were demonstrated.

The modules were revised according to the evaluation and suggestions of the expert's panel and colleagues. The CEM coordinating staff assisted in monitoring the completion of the revised product. Equipment and materials were identified and prepared for the field testing of the modules.

G. Field Testing of Modules. Each of the revised modules was tried by the writer on a faculty group representing the target clients. One or two teachers in the same subject, with training experience, acted as critic-observer(s) during the trial run. The quality of the written module and its effectiveness on the participants were evaluated. The pilot run afforded a chance to test the exercises in a school setting. Wherever possible, some activities were tried by the trainer on actual students. The materials and facilities of the school were also used. Content and strategies, theories and research as well as use of materials, equipment and technology were discussed with the participants. This way, the teachers were provided the chance to deepen understanding of theory and research behind the knowledge and skills being taught to collaborate in solving problems and connect all these to the focus on improvement of student learning. All these would contribute towards a more effective program design (Hawley & Valli, 1999).

The ensuing critiques were discussed with the experts panel once again and the writer made revisions anew, where necessary. Some modules experienced a number of alterations in techniques; in other cases, new activities were introduced, with notes on variations for certain topics and teaching levels. The pilot run also served as an opportunity to identify new recruits for the pool of facilitators. The observers in some sessions evolved as trainers in later implementation of the PEPS.

H. Production of final modules. Each module was subjected to close review as to compliance with the required format and completeness of elements. The introductory note included the purpose, the target client, the instructional objectives and prerequisite skills. The text included the syllabus and the details of content and activities. The contents were checked by experts for accuracy, theoretical and pedagogical support. The lessons should contain relevant examples from learners' environment and previous knowledge, illustrations that are suitable, and self-learning devices and techniques that arouse critical thinking, all organized in logical and coherent sequence. They should also include research, readings and assessment devices. Technology and media support are indicated where applicable and facilitative of learning.

The CEM coordinating staff secured all materials relevant to the production of the final modules. Every page of the text, appendices, worksheets, handouts, trainer and learner guides were reviewed and edited, visual aids, CD's were screened for quality. The final form of the module was produced in hard and soft file copies. Trainer's guides and participant's handouts and worksheets were reproduced and bound into sets for the desired number per training session.

III. Implementation of the PEPS

The PEPS development project was launched in September 2003 during a national conference of the CEM to its test subscribers and a survey was made of the schools' interest in particular topics. The resulting demand profile was used to prepare for the first schedule of seminars in the series. The field test of the modules proceeded till the end of Year 2004. The final implementation of the series started in 2005.

The PEPS seminar-workshops were offered at subsidized rates for the CEM test user schools; nonetheless, the response to the PEPS was slow. Besides the cost, the 5-day format rendered it difficult for some schools to release their faculty. This led to the revision of modules to adapt to a 4-day and a 3-day format, with corresponding reduction of coverage. Some strategies were also tried in terms of discounted rates and subsidies for participants.

Over the years, from 2005 to 2007, a total of 23 seminars were conducted in the four subjects, participated in by 138 schools and 232 teachers. (See Table 4 and Fig 3). The most popular seminars were those in Mathematics and English. This may indicate the priority that schools themselves gave to these core subjects in their efforts at improvement.

Table 4.
Summary of Seminars, Participants and Schools per Year across Subjects

	English			Mathematics			Science			Filipino			Total		
	No. of Seminars	No. of Participants	No. of Schools*	No. of Seminars	No. of Participants	No. of Schools*	No. of Seminars	No. of Participants	No. of Schools*	No. of Seminars	No. of Participants	No. of Schools*	No. of Seminars	No. of Participants	No. of Schools*
2005	2	32	21	2	25	22	1	12	12	1	6	6	6	75	61
2006	3	27	10	5	45	25	2	13	6	2	22	10	12	107	51
2007	1	13	9	3	26	9				1	11	8	5	50	26
TOTAL	6	72	40	10	96	56	3	25	18	4	39	24	23	232	138

*schools may have been counted more than once if they have sent participants to more than one seminar

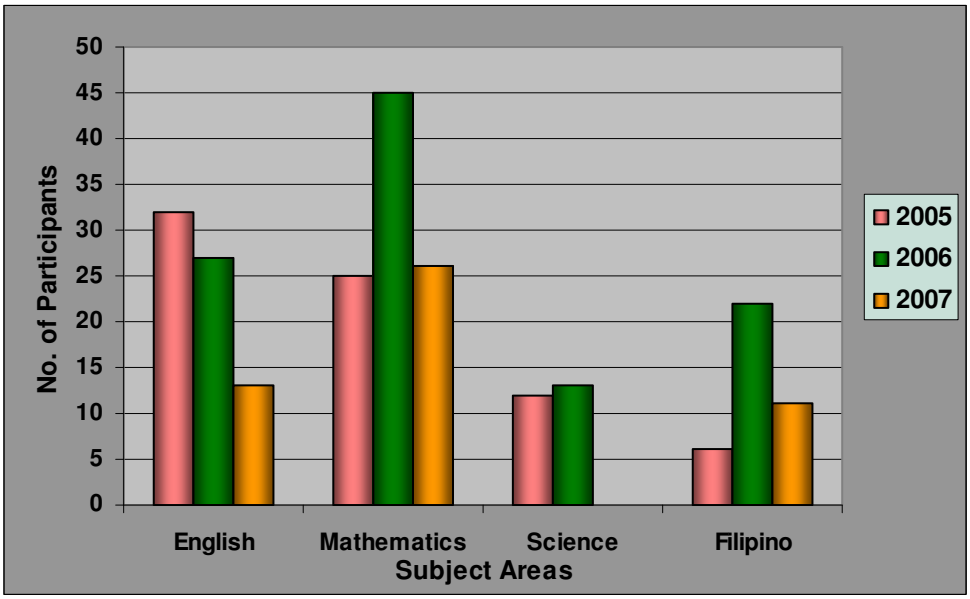

Figure 3. Distribution of Participants per Subject from 2005 to 2007

Before each seminar, the participants respond to a training needs assessment survey and a diagnostic pretest on sample competencies to be covered. Some tests are of the objective multiple-choice type. The facilitator also starts the seminar with a leveling of expectations. The results of all these provide him with baseline information about the teachers and enable him to alter some specific objectives or add supplementary ones, as needed, and conduct the session in ways that would benefit the participants most.

The trainers kept to the scheduled activities as closely as needed to attain the objectives. Daily feedback is done and discussions about the content, strategies, and participants' skills and behavior serve to deepen their learning, correct misconceptions and lead to a greater appreciation of the subject. Through the posttest and the sample lesson presentations, the participants demonstrate knowledge and skills acquired as well as their ability to transfer learning to students upon return to their schools.

IV. Evaluation of the PEPS

Results of Pretest and Posttest. As earlier mentioned, some trainers used an objective test on the coverage of the content areas to be learned during the seminar. Some used this as diagnostic pretest, others as posttest to gauge what was retained, and still others in a pretest-posttest design. Table 5 shows the comparative pretest-posttest results for three seminars, in English, Science and Mathematics.

For the English module, the participants' performance in both pretest and posttest remained at the same score level (72%) while the science and mathematics groups appear to have benefited from the sessions, gaining a few points beyond their low pretest scores. It is also interesting to note the proportion of teachers who showed improvement, with all the Mathematics participants registering an increase in performance.

Table 5.
Results of Pretest and Posttest in Three Seminars

Seminars	# items	Mean Percent Correct			Proportion of participants with increase in scores
		Pre-Test	Post-Test	Difference	
Teaching and Testing Reading, Grammar, Vocabulary	75	72%	72%	0%	50%
Physical Earth, Its Weather and Climate	40	35%	46%	11%	80%
Number Theory and Rational Numbers	35	48%	62%	14%	100%

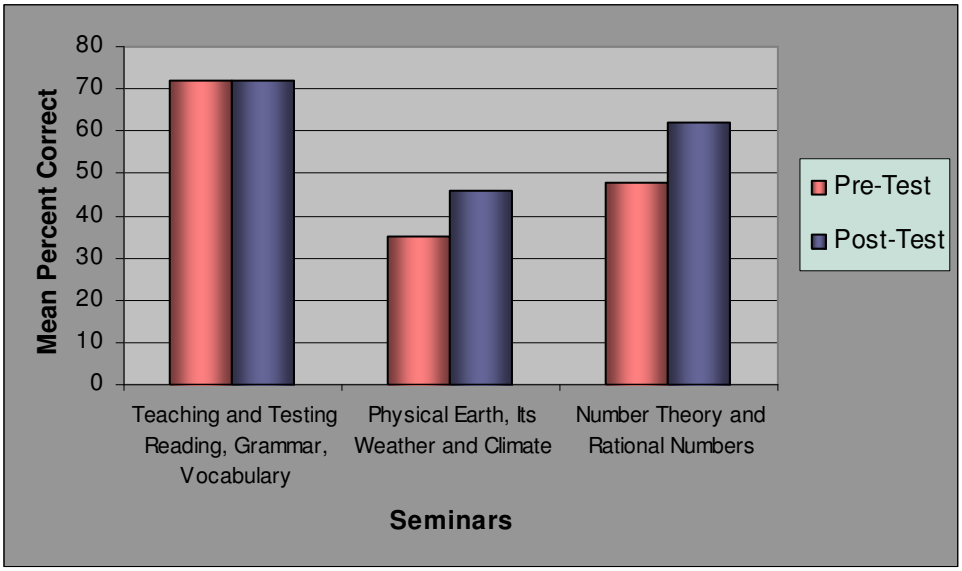

Figure 4. Comparative Results of Pretest and Posttest in Three Seminars

Results of Seminar Evaluation. Aside from the daily feedback form, the critiquing after each activity, the content discussions, and the journals, an evaluation form was accomplished by the participants at the end of the seminar.

The following results are derived from the responses of participants to the evaluation form. Each specific content covered in the area module was judged as to quality of delivery, strategies involved, and usefulness to one's situation in school. The resource person or trainer was also evaluated in various aspects, such as mastery of subject, communication skills, teaching enthusiasm. Training management had to do with the smoothness of running the activities, materials and visuals, venue and time management. A summary evaluation of a sample module from each of the core subjects is shown in Table 6. The Mathematics module was on *Number Theory* and *Rational Numbers*, for English – *Reading Notes and Strategies*, for Science-*Genetics*, and for Filipino – *Panitikan* (Literature). The ratings given by participants were on a 4-point scale, and the mean score for each specific content was obtained. The overall mean for each subject module and for each criteria are all close to Excellent. This is evidence of the generally positive regard the participants had of the PEPS seminars.

Table 6.
Evaluation Summary Results of Sample Modules in Core Subjects

Subject Areas	Quality of Sessions	Effectiveness of Strategies	Applicability to work	Resource Person	Training Management	Overall Rating
Mathematics	3.8	3.8	3.9	3.9	3.8	3.8
English	3.8	4.0	4.0	3.9	3.8	3.8
Science	3.9	3.9	3.9	3.9	3.6	3.8
Filipino	3.7	3.6	3.8	4.0	3.8	3.9
Average	3.8	3.8	3.9	3.9	3.8	3.9

Note: 4 = excellent; 3 = good; 2 = fair; 1 = poor

From the written comments and suggestions given by the participants at the end of the seminars, the ones most frequently noted are shown in the boxed list. These were derived from different modules and occurred repeatedly as the modules were also run for different groups of participants. The statements add support to the numerical results of the evaluation.

What do I like about the seminar?

- It has helped me evaluate myself as a teacher facilitator, the best medium in the learning process
- Video presentation of an actual classroom clearly showed application of strategies
- Small groups gave the opportunity for easy interaction
- The setting, with loads of reading materials, was conducive to authentic learning
- Techniques, games, activities were helpful and interesting
- Misconceptions being taught to students were corrected
- Transfer of knowledge was maximized
- Hands-on experiences were very useful
- Journals and dialogues were good for reflecting on one's learning
- Varied activities were undertaken and materials very easy to obtain
- We learned how to explain the algebra concepts in a manner that students could easily understand
- I learned how to motivate a class using an experimental situation
- We were able to try different ways of solving word problems

Figure 5. Some Participants' Comments on the PEPS seminars

Concluding Remarks

Through the PEPS modules, the CEM has shown how test data could be used to provide focus in designing faculty training programs. Analysis of results have revealed that there are many competencies not mastered by students across the grades in basic education, and that areas of deficiencies in the lower grade levels tend to affect learning of their more complex version in the upper years. Participants to the PEPS seminars have expressed strong appreciation of the quality of the sessions, the facilitators, and the learning they have gained. The generally encouraging feedback about their learnings and the application to their work gives justification for the efforts invested in the project.

The PEPS program, however, is intended for a long-term impact on student learning. It is to train teachers who will in turn implement new ways of helping their own students. There is need to proceed with a more powerful evaluation that focuses on the effect on student achievement. (Killion, 2002). This may be achieved by involving the participants in monitoring activities after the training. Lessons under the areas studied could be scheduled, and peer or mentor observation could be done during the actual lessons. A pretest-posttest design for target competencies may also be used for assessing the impact of the training on the students. The assessment could include measures of knowledge, skills and attitudes related to the subject matter. Some research on this aspect has already been started, results of which will be presented in future reports.

To extend the benefits of the program, it would be well to analyze more recent results of students' tests on the core subjects and proceed to devise in-service training to match the new areas of concern. Offering seminars on topics that meet their students' needs may be more appreciated by the schools. The continuous efforts at utilizing test data will lead to more focused and improved teaching interventions. It will not hurt to increase the library of modules and revise existing ones with versions adapted to actual needs in the school situation.

The PEPS could be part of a more comprehensive school improvement program which includes staff development, academic supervision, instruction, assessment, and research. To this end, support could be obtained from public or private sectors for the conduct of the seminars in schools where teachers could benefit from more intensive and stimulating training.

The country has been challenged with discouraging outcomes of student learning in both local and international measures, prompting top education leaders to call on all sectors to help bring back quality to basic education (Lapus, 2007). The education department has set in motion a basic education reform agenda which highlights a national strategy in support of learning in the core subjects, and the structural support that goes with this (DepEd, 2005).

Amidst these efforts, policy makers must remember that the kinds of change that really matter are those that build teacher capacity and professional culture. There are no shortcuts to educational improvement (Ingvarson, 2005). Evidence-based decision making in professional development, as discussed in this paper, is certainly a move in the right direction.

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APPENDICES

Appendix A1
Areas of Concern in Filipino across Elementary Grade Level

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Pagkilala ng Salita (66)					
Pangkat ng mga Salita (78)					
Balarila (75)		Pangngalan(55)	Pangngalan (48)		
	Pandiwa (64)			Pandiwa (57)	Pandiwa (53)
	Pang-uri (64	Pang-uri(58)		Pang-uri (46)	
		Pang-abay (45)		Pang-abay (54)	
					Pangatnig (42)
	Pangungusap (61)	Pangungusap (55)	Pangungusap (51)	Pangungusap (48)	Pangungusap
		Pagsusuring Pangkayarian (45)		Pagsusuring Pangkayarian (56)	
					Pagsulat (43)
	Talasalitaan (58)	Talasalitaan (51)	Talasalitaan (51)	Talasalitaan (52)	Talasalitaan (49)
	Pag-unawa sa Babasahin (62)	Pag-unawa sa Babasahin(42)	Pag-unawa sa Binasa (42)	Pag-unawa sa Binasa (43)	
	Pagkasunud-sunod ng mga Pangyayari (57)				
Norm (82)	**Norm (69)**	**Norm (60)**	**Norm (58)**	**Norm (60)**	**Norm (55)**

Note: Percent Correct Mean Score enclosed in parenthesis

Appendix A2
Areas of Concern in Filipino across Secondary Grade Level

Year 1	Year 2
Pang-abay (43)	
Pangungusap (60)	
Pagbuo ng Talata (43)	
Talasalitaan (51)	
Kahulugan ng Idyoma at Salawikain (62)	
Pag-unawa sa Babasahin (55)	Pag-unawa sa Babasahin (66)
	Kasanayan sa Pag-aaral (70)
Norm (67)	**Norm (71)**

Appendices (Cont'd)

Appendix B1
Areas of Concern in Science across Elementary Grade Level

Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6
Plants (57)	Plants (45)		Plants(41)	Plants (50)	
Animals (58)	Human Being (53)			Animals (47)	
Matter (60)		Matter (50)	Matter (43)	Matter (48)	Matter (55)
				Energy (42)	Energy (43) Heat (46)
			Forces (51)	Force & Motion (38)	Force & Motion (47)
		Light & Shadow (51)			
		Magnets (44)			Magnets (47)
			Electricity (46)		
			Weather (52)	Weather & Climate (41)	Weather & Climate (48)
					Ecosystem (49)
	Earth & Space (51)	Earth (50)	Earth (46)	Earth (40)	The Earth (48)
		Solar System (41)	Space (39)		Solar System & Beyond (45)
Norm (61)	**Norm (56)**	**Norm (55)**	**Norm (53)**	**Norm (50)**	**Norm (59)**

Appendix B2
Areas of Concern in Science across Secondary Grade Level

Year 1 (General Science)	Year 2 (Biology)	Year 3 (Chemistry)	Year 4 (Physics)
Nature of Matter(42)	Nature of Biology (47)	Atom (43)	Modern Physics (47)
	Chemical basis for life (50	Symbols, Formulas, & Equations(37)	Force & Energy (44)
	Energy transformation (50)	Phases of Matter (38)	
Earth & the Universe (45)	Organ systems (45)	Chemical Bonding (41)	Electromagnetic Energy (42)
	Reproduction(49)	Types of Chemical Reactions (42)	Waves & Energy (47)
	Heredity, Variation, & Population (43)	Chemical Kinetics (30)	Energy & Communication(31)
	Evolution(49)	Electrochemistry (37)	
	Diversity & Adaptive Forms of Living Things (43)	Carbon and its compounds (48)	
Norm (52)	**Norm (51)**	**Norm (50)**	**Norm (49)**