



Policy Notes

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Teacher Development Needs Study (TDNS): Findings and Recommendations

BACKGROUND

The issue of the contribution that teacher quality makes to student-learning achievement has been at the forefront of international research in education for at least three decades. In a major meta-analysis of this research, Hattie (2003) concluded that, based on effect size measures, teacher quality contributes 30% to student learning achievement.

The Department of Education (DepEd) is aware of the contribution that teacher quality makes to the cognitive, affective and social development of students in its schools. It is also mindful of the criticism of many academic commentators that a significant proportion of DepEd teachers are lacking in subject knowledge and pedagogical skill, and that this is a major factor in the chronically low performance of its students in the National Achievement Tests.

To address these concerns, DepEd requested the Philippine National Research Center for Teacher Quality (RCTQ) and the National Center for Science, Information and Communication Technology and Mathematics Education in Rural and Regional Australia (SiMERR) to conduct a national study analyzing the extent to which DepEd teachers are prepared to deliver the K to 12 curriculum in terms of their content knowledge. To achieve this, RCTQ conducted the Teacher Development Needs Study (TDNS).

The principal aim of TDNS was to develop tests in Filipino, English, Mathematics and Science at three Grade levels, 6, 8 and 10 and identify the level of preparedness of DepEd teachers in delivering the K to 12 curriculum.

Development and administration of the tests proceeded in four stages:

- Test development;
- Pilot testing;
- Test administration; &
- Scoring and coding

TEST DEVELOPMENT

The development process was iterative and collaborative involving RCTQ and SiMERR teams, as well as subject specialists from several educational institutions. Subject-knowledge test development was informed by a comprehensive review of the K to 12 curriculum documents. The tests comprise two parts: multiple-choice questions (MCQ) and open-ended questions (OEQ).

RCTQ convened four subject review panels, comprised of faculty from PNU, neighbouring higher education institutions and one DepEd school. Panel members were trained in the Structure of Observed Learning Outcomes (SOLO) Model. The SOLO Model was used in the construction of test items and subsequent analyses of teachers' responses to those items.

PILOT TESTING

The tests were extensively pilot tested with different teacher samples on different occasions over an 18-month period. Rasch analysis was used to estimate the validity and reliability of the tests, and these estimates were considered in refining the final

RECOMMENDATIONS

Against this background the following recommendations are offered:

1. For the National Education Academy of the Philippines (NEAP) and DepEd specialists such as curriculum designers:

- i. to build a deep understanding of the TDNS findings as a basis for designing closely targeted, in-service professional development activities directed at improving teachers' subject content knowledge;
- ii. to review curriculum design; and
- iii. to improve teaching and learning materials supporting classroom activities.

2. For NEAP to adopt an approach to in-service development that closely links growth in subject content knowledge with pedagogical skills development based on the Philippine Professional Standards for Teachers. Under this strategy, new and different ways of teaching a particular subject would be combined with building subject knowledge.

3. For DepEd to consider:

- i. linking NEAP's in-service development activities in English, Filipino, Mathematics and Science with course-work masters degree programs conducted by selected TEIs specialising in such course work programs; and
- ii. rewarding graduates of such programs with accelerated advancement.

instruments. Two forms of Rasch analysis were undertaken for each paper; binary and partial credit.

TEST ADMINISTRATION

The final assessment was conducted in all 17 regions and uniform procedures were followed at all sites to ensure equity for the participants and integrity of the results. Administrative measures were implemented to ensure the

security of test papers.

SCORING AND CODING

Responses to MCQs were recorded on computer-readable media and were scanned into a test database. Assessment teams, which included members of the subject-review panels, coded teachers' responses to the open-ended questions in accordance with the SOLO model. Coding rubrics were developed and elaborated collaboratively.

DATA ANALYSIS

The test-response data were analyzed using the one-parameter Rasch Model. The Rasch Model computes question difficulty and respondent ability on the same underlying, equal-interval scale. It also produces psychometric parameters that assess internal construct validity, reliability, internal consistency and question discrimination.

Binary and partial credit analyses were undertaken for each test. For the binary analysis, answers were coded as either correct or incorrect. For the partial-credit analysis, answers were coded on a four-category scale (see Table 1). For MCQs, the options presented represented different levels of the teacher's understanding of the competency being tested. For the OEQs, the assessors interpreted the answers on the four-point partial-credit scale.

The binary-credit scores provide the clearest indication of whether the teachers possess a thorough understanding of the competencies being tested, and to that extent it assesses their level of preparedness to teach the subject effectively at the respective Grade level.

In contrast, the partial-credit scores provide an assessment of the level of the teacher's knowledge, skill and understanding, and identify gaps in their preparedness to teach their subject to students. They constitute an empirical basis for designing and delivering in-service teacher development programs that are closely targeted at the teachers' current level of preparedness to teach effectively.

FINDINGS

The Teacher Needs Development Survey yielded important insights

Table 1. Four-category scale for partial-credit analysis

Scale	Description
1	Incorrect
2	Displays some knowledge, skill and understanding
3	Displays a higher level of knowledge, skill and understanding
4	Completely correct

that can inform the conduct of in-service training and other continuing professional development activities.

- A large proportion of DepEd teachers are poorly prepared to deliver the K to 12 curriculum in Filipino, English, Mathematics and Science in Grades 6, 8 and 10.
- Teachers displayed a tendency to extract only some of the relevant information from the question and to use only partial information in constructing an answer.
- Many teachers did not engage in higher-order thinking irrespective of their particular discipline, which means that they showed insufficient skills in analysis, synthesis and evaluation.
- In the case of science at all three Grade levels, the majority of teachers failed to demonstrate an adequate level of knowledge of the subject.

It is important to acknowledge, however, that the fact that many teachers did not demonstrate higher order thinking skills does not mean they cannot do so. It could be that the realities of many Filipino classrooms - especially large class sizes and a wide spread of student ability within each classroom - constrain teachers to adopt didactic forms of teaching that facilitate superficial rather than deep thinking.

POLICY IMPLICATIONS

The findings of the study provide important information for curriculum experts, designers of teaching and learning materials, assessment specialists and instructional leaders who design in-service training.

- The fine-grained analysis of teachers' responses direct attention to specific issues they confront in dealing with the cognitive complexity of the curriculum. Specifically, it may be that

some amendments are needed to the curriculum to reflect both the nature of the subject areas and the cognitive development of students.

- To address concerns over pedagogical skills and inadequacy of content knowledge, well-targeted in-service training on content, strategies and instructional materials development need to be designed in collaboration with subject specialists and other stakeholders.
- Teacher quality should be elevated and sustained through continuous professional development activities based on teacher needs.
- The teachers' level of knowledge of their subjects will serve as a reasonable foundation upon which to build their capacity to be effective teachers with well-targeted in-service training.

CONCLUDING REMARKS

Using direct measurement of teachers' content knowledge yields insights on gaps in their preparedness to teach specific subjects areas. Those gaps may be addressed through well-targeted and judiciously-monitored continuing professional development activities that would strengthen teacher quality.

PROJECT TEAM

PNU-RCTQ

Gina O. Gonong, PhD, *Director*
Jennie V. Jocson, PhD, *Deputy Director*
Allan S. Reyes, PhD, *Senior Program Manager*
Marilyn U. Balagtas, PhD, *former Director*

UNE-SIMERR

John Pegg, PhD, *Director*
Joy Hardy, PhD, *Deputy Director*
Ken Vine, PhD, *Principal Research Adviser*
Greg McPhan, PhD, *former Research Manager*

PROJECT OFFICER

Caleb Ricardo D. Pantoja

SUPPORT STAFF

Ian Kenneth D. Magabilin
Jerred M. Romulo
Michael Wilson I. Rosero