Abstracts of Researches on Basic Education

COGNITIVE ACADEMIC LANGUAGE PROFICIENCY THRESHOLD LEVEL SKILLS IN WRITTEN FILIPINO AND CROSS-LINGUAL TRANSFER
(A Doctoral Dissertation)

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The main purpose of this investigation was to determine the academic language functions that constitute threshold level proficiency in written Filipino among Grades 4, 5, and 6 public school students. At the same time, it tried to determine at which grade levels the students differ in their academic language abilities. Lastly, it looked into the relationship between acquisition of the first language (L1) Cognitive Academic Language Proficiency (CALP) threshold level skills and cross-lingual transfer.

A total of 60 nine-to-13-year old Grade 4, 5, and 6 students from two average performing public schools in Quezon City served as subjects of the study. Each grade level was represented by a mix of twenty heterogeneously grouped boys and girls whose first language was Filipino.

Research data were obtained through a two-part researcher-made CALP writing test in Filipino and English. The quantitative analysis of the written samples was done using an adopted marking scheme that facilitated the identification of the compositions that reached the set threshold level proficiency cut-off scores. On the other hand, the qualitative analysis that determines the academic language skills constituting threshold levels was done through a researcher-devised checklist. The Pearson Product-Moment Coefficient of Correlation was to test the relationship between L1 and L2 academic language proficiency.

The data analysis revealed that while all the three grade level demonstrated some degree of ability to express cause and effect relations, compare, contrast, and classify, they encountered difficulties in defining and describing as well as following rules of basic grammar, syntax, lexicon, and mechanics.

Findings also showed that expressing cause and effect relations and comparing and contrasting are the academic language functions that constitute threshold level skills in academic Filipino. Reaching the desired level of proficiency also meant ability to achieve text unity through the statement of main and support ideas and text cohesion through the use of appropriate and indirect links such as keywords, synonyms, and pronouns.

In addition, the study indicated that CALP threshold level in written Filipino is approximately reached at the initial phase of grade 6 or five years after

students have undergone four months schooling. Finally, significant correlation between L1 CALP and cross-lingual transfer of skills was established by the study.

On the basis of its findings and conclusions, the study proposed a review, and if warranted, a re-structuring of the desired learning competencies as well as the scope and sequence for Filipino and English. Corollary to this, the production of learning materials and developing language proficiency and higher order thinking skills were deemed necessary. With the current stress being put into the teaching and development of lifetime higher order thinking skills, the re-thinking of both pre-service and in-service training for language teachers was recommended. Lastly, the study also suggested the validation of the current study by explaining its scope through the inclusion of Cebuano and Ilocano to complement the study on the use of the vernacular in teaching initial literary skills as well as other variables that may have an impact on an individual's linguistic development.

DEVELOPMENT OF A PROBLEM SOLVING ABILITY TEST IN HIGH SCHOOL CHEMISTRY
(A Master's Thesis)

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This study aimed to develop a test that would measure the problem solving ability of high school chemistry students. The reliability of the instrument was determined and the construct validity of the Chemistry Problem Solving Ability Test (CPSAT) was established in terms of the five factors of chemistry problem solving ability under study, namely, problem comprehension, understanding associated chemical concepts, understanding relationships among chemical concepts, applying specific problem solving strategies, and using required mathematics.

The study combined quantitative and qualitative approaches to research by using a descriptive, correctional design. The following null hypotheses were tested at .05 level of significance: there is no relationship between student CPSAT and GALT score, and the student CPSAT score is not a significant predictor of the final grade in chemistry.

The Group Assessment of Logical Thinking Test (GALT), developed by Roadrangka, Yeany and Padilla, was used as criterion in determining the concurrent validity of the CPSAT. Both tests were administered to third year sections comprising 118 students in Marikina High School.

The student score in the CPSAT was related to the chemistry final grade by using linear regression to determine the predictive validity of the problem solving ability test.

The reliability of the CPSAT was determined using Cronbach alpha, while the construct validity was established by employing the factor analysis procedure. The content validity of the CPSAT was established by a panel of experts.

The developed CPSAT was found to have a high reliability coefficient of 0.8088 and a concurrent validity with a low but significant coefficient (0.222) showing a positive relationship with GALT, a measure of logical thinking ability. It has predictive validity with moderately high coefficient (0.432), that is, a positive significant predictor of chemistry achievement. It has the following constructs: Problem Familiarity, Understanding Associated Chemical Concepts, Applying Specific Problem Solving Abilities and Using Required Mathematics, Problem Comprehension, Understanding Mathematical Relationships, and Understanding Relationships among Chemical Concepts.

DEVELOPMENT AND VALIDATION OF AN INSTRUCTIONAL MODEL FOR HIGHER COGNITIVE LEARNING IN SECONDARY SOCIAL STUDIES
(*A Doctoral Dissertation*)

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Drawing from the Constructivist Theory which states that the learner is part of an expanding interactive socio-cultural and physical environment and that a 12-year old child may be presumed to have reached the formal operations stage of intellectual development, the researcher developed the Constructivist Instructional Model (CIM) for the teaching of content and higher order thinking skills in secondary Social Studies. The model describes how the teacher may assist the learner to develop intellectual skills and abilities essential in a complex society.

The study aimed to determine the effectiveness of the CIM in the development of higher order thinking skills among first year students of Social Studies. Using Filipino as the medium of instruction in Social Studies, 15 reading materials and instructional plans were developed by the researcher to teach content (a unit on *The Philippine Revolution*) and to develop thinking skills following the four categories formulated by Gallagher & Aschner, Cunningham and Guilford. The instructional model was structured with detailed activities/work sheets and information-processing questions to enable the learner to move from one thinking level to another. These instructional plans were tried out among 79 students in two heterogeneous classes at the U.P. Integrated School to test whether students exposed to the CIM differ from students not exposed to it in terms of convergent, divergent, and evaluative levels of thinking; and whether there is a relationship between the scores of the experimental and control groups in a general thinking test and their scores in a test on *The Philippine Revolution*. A panel of experts validated all the

materials and assessment instruments while the tests were pilot-tested to establish reliability.

Results showed that the pretest performance of the experimental and control groups was lower than the expected 60% performance level, but the posttest scores increased and reached the 60% performance target in all the skills. The experimental group excelled in convergent thinking, the highest mean score of the control group was in cognitive memory, while the two groups scored lowest in evaluative thinking. Both groups had significant pre-post test mean gains in all the skills, but the gains of the experimental group in divergent thinking were more than those of the control group in both the Unit Test in Philippine Revolution and in the general test of Thinking Skills. There was no significant difference in the mean gains of the two groups in cognitive memory, convergent thinking, and evaluative thinking, indicating that conventional thinking can also develop these three skills as well as the CIM. But as a whole, the mean gain difference of the experimental group was significantly higher than that of the control group, indicating that the CIM was more effective in developing higher order thinking skills.

Statistical tests revealed that the computed r values of .455 for the Unit Test on the Philippine Revolution and of .478 for the general cognitive test are significant at .05 level. Hence, the test reliably yielded consistent results. Likewise, the tests of correlation between the two cognitive tests revealed significant correlation on cognitive memory, convergent thinking, and evaluative thinking but not in the divergent skills. Finally, the data showed that students in the experimental group perceived the teacher's questions in the different activities as challenging because they were encouraged to think rather than memorize.

It was concluded that the reading materials and instructional lessons used in the try-out classes were valid and user-friendly. The teaching-learning activities of both experimental and control groups were challenging and stimulating. The teaching strategies were appropriate for the teaching of the unit on *The Philippine Revolution*. The two pre-post tests were valid and reliable; thus, they were considered good assessment tools to measure students' performance in the higher thinking skills.

The following were recommended: (1) utilization of the four categories of thinking skills formulated by Gallagher, Aschner, Cunningham and Guilford because the categories are applicable to any Social Studies unit or lesson; (2) formulation and use of appropriate questions and worksheets for each level of thinking skills to guide the students and the teacher-facilitator in organizing ideas and instruction; (3) development of similar assessment instrument for other year levels in secondary Social Studies; (4) adoption of the CIM in any Social Studies unit because of its flexibility for instruction and its sufficiency even for inexperienced teachers; (5) replication of the research to further probe the effectiveness of the Constructivist Instructional Model in developing higher thinking skills in other subjects and grade levels; and (6) further research on learning processes and factors that influence the development of thinking skills among students of diverse abilities.