

PEDAGOGICAL CONTENT KNOWLEDGE OF TEACHERS IN ALGEBRA



PHILIPPINE NORMAL UNIVERSITY
The National Center for Teacher Education

**PEDAGOGICAL CONTENT KNOWLEDGE (PCK) OF GRADE 8
MATHEMATICS TEACHERS IN ALGEBRA IN TALACOGON**

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**ABSTRACT**

Keywords: PCK LEVEL, MEAN SCORES, ALGEBRA

This study was conducted to determine the PCK level in Algebra of Grade 8 Mathematics Teachers of Talacogon as basis for an in-service training. The PCK Instrument composed of open-ended questions was administered to the 11 Grade 8 Mathematics Teachers coming from three (3) big schools and seven (7) annex schools of the research locale. An interview to confirm the answers of teachers was also conducted. The answers of the teachers were rated by the researcher and other two independent raters using the developed rubric. Different statistical tools were used to analyse the data gathered. Frequency and percentage were used to describe the respondents' profile- educational background, number of years in teaching mathematics, number of years in teaching Grade 8 Mathematics, and number of mathematics-related trainings attended. The mean was used to determine the PCK level of teachers and the differences of the mean scores of teachers in the different algebra topics when grouped according to profiles. Results showed that among the three topics of Algebra, namely, (1) special products and factoring, (2) algebraic expressions, and (3) relations and functions, teachers PCK level in algebraic expressions was in developing level only because majority of the teachers performed low in items requiring them to transform story problems into mathematical sentences and unpack mathematical language. Although the over-all PCK level of teachers in algebra was exemplary. Furthermore, when the differences of the mean scores of teachers in the different algebra topics when grouped according to profiles were

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determined, differences were noted in the topic special products and factoring when grouped according to number of years in teaching mathematics, number of years in teaching 8th grade mathematics, and number of mathematics-related trainings attended. There were no differences in the mean scores of teachers in the other two topics. When difficulties of the teachers in the sub-constructs of PCK were taken into account, results showed that teachers performed lowest in knowledge of mathematical structure and connections (sub-construct a) which equalled to basic level only. This was satisfied by the fact that teachers performed lowest in the tasks under this sub-construct that require them to use manipulatives, to decompress, and to trim mathematical concepts. The designed in-service training was mainly formulated to develop teachers' conceptual fluency in algebraic expression, hone the knowledge in special products and factoring of the neophyte teachers and the teachers less exposed to trainings, and widen teachers' horizon in mathematical structure and connections.



ABSTRAK

Keywords: PCK LEVEL, MEAN SCORES, ALGEBRA

Ang pag-aaral na ito ay naglalayong matukoy ang *PCK level* sa Algebra ng mga guro sa matematiks ng ikawalong baitang sa Talacogon upang magiging batayan para sa isang in-servis treyning. Isang instrumento sa *PCK* na naglalaman ng mga *open-ended* na tanong ang pinasagutan sa 11 na mga katugong guro na galing sa tatlong malalaking paaralan at pitong malilit na paaralan sa lokasyon ng pag-aaral. Ginanap din ang isang interbyu sa mga guro upang komfirmahin ang kanilang mga kasagutan sa *PCK*.

Instrument. Ang kanilang mga kasagutan ay binigyan puntos ng tagapanaliksik at iba pang dalawang guro gamit ang gawang rubrik. Ginamit ang prikwensiya at porsyento upang ilarawan ang kanilang profayl- edukasyon, bilang ng taon sa pagtuturo ng matematiks, bilang ng taon sa pagtuturo ng matematiks sa ikawalong baitang, at dami ng mga sinalihan na treyning sa mathematics. Ginamit din ang *mean* upang matukoy ang kanilang *PCK level* at para tukuyin kung may pagkakaiba ang *mean scores* ng mga guro sa mga topiko ng Algebra kapag nakagrupa base sa mga profayl. Sa pag-aaral ay lumabas na sa mga paksa ng *Algebra* na, (1) *special products and factoring*, (2) *algebraic expressions*, (3) *at relations and functions*, ang mga guro ay may pinakamababang *PCK level* na nasa *developing lamang* sa paksang *algebraic expressions* sa kadahilanang marami sa mga guro ang nagkulang sa pagsagot sa mga pasalitang katanungan at sa pagbigay ng mga makabulohang paliwanag sa mga simbolo ng matimatiks. Gayunman ang pangkalahatang *PCK level* ng mga guro sa Algebra ay *exemplary*. Lumabas sa pag-

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aaral na may pagkakaiba sa *mean scores* ng mga guro sa topikong *special products and factoring* nang pinagpangkat-pangkat ayon sa haba ng pagtuturo sa matimatiks at matimatiks sa ika-8 baitang, at dami ng sinalihang treyning sa matimatiks. Walang nakitang pagkakaiba sa *mean scores* ng mga guro sa iba pang topiko. Nang sinuri naman ang mga paghihirap ng mga guro sa ibat-ibang *sub-constructs* ng PCK, nakita na ang mga guro ay nakakuha ng pinakamababang performans sa kaalaman ng pangmatimatiks na struktura at koneksyon na napabilang lamang sa *basic level* dahil na rin sa pinakamababang performans ng mga guro sa paggamit ng manipulatives, decompressing, at trimming. Ang binuo na *in-service* treyning ay unang-una para sa paghubog sa konseptyuwal na kaalaman ng mga guro sa topikong *algebraic expressions*, pagpalago sa kaalaman sa *special products and factoring* ng mga baguhang guro pati ang mga guro na kakaunti pa lamang ang mga treyning na sinalihan, at pagpalawak sa kaalaman ng mga guro sa pangmatimatiks na struktura at koneksyon.