

香港資優教育學苑
The Hong Kong Academy for Gifted Education

Commendation Award Project in Gifted Education

Key Learning Area(s)	Mathematics
Project Title	Enrichment Programme for Students Talented in Mathematics
School Name	Ju Ching Chu Secondary School (Kwai Chung)
Student Grouping	Homogeneous grouping
Summary	It is a pullout programme for students talented in Mathematics. The lessons are designed to develop students' higher-order thinking ability in solving Mathematics problems. Bloom's Taxonomy is used as a framework to categorise different levels of cognitive process in problem solving. Worksheets are designed based on Bloom's Taxonomy's framework. The method of exhaustion is introduced. Throughout the lessons, students can learn to remember, understand, apply, analyse, evaluate and create in the process of problem solving. Teachers act as facilitators and observers to encourage students' independent learning.
Aim	Developing students' problem solving ability in Mathematics
Authors	Ms. Chan Mei-kuen & Mr. Chui Ka-shing
Target students	Secondary 1-3 students whose academic result in Math is above average, having participated in off-site Math competitions or enrichment programmes, and teachers' recommendation.
Activities	<u>Lesson 1</u> : Discovery of Problem Solving Method – Exhaustion <u>Lesson 2</u> : Study of Problem Solving Method – Exhaustion
Project evaluation	The effectiveness of student learning is evaluated through how well they can use exhaustion method in solving difficult Mathematics problems. Students were asked to complete a worksheet on Mathematics problems before and after the programme for assessment of their learning. In the pre-test, only a few students could use exhaustion method. However, in the post-test, all students could understand the concept and skills of exhaustion method and apply it to solve Mathematics problems. In addition, evaluation questionnaire has been conducted to collect students' feedback on the programme. Most of the students were satisfied with what they had learnt in the programme. One F. 1 student commented that the Mathematics problems were

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	<p>difficult while some F.3 students expected to learn Mathematics at a more advanced level. This learner diversity should be properly addressed in future programmes. Students suggested that the grouping of F.1 to F.3 students in a class was not appropriate because of diversity in ability. They expected to have more extended learning after the programme and teachers could use a variety of teaching methods.</p>
Teacher's Reflection	<p>The enrichment programme is a good start heading towards a more systematic approach in providing a flexible and challenging learning environment for the gifted to stretch their giftedness. The comparison between the pre-test and post-test result as well as students' feedback show that the enrichment programme has achieved its objective of enhancing students' problem solving skills and ability in Mathematics. Additionally, it can be observed that during the process of problem solving, gifted learners and high achievers' behaviour and performance differ significantly in the aspects of ability, task commitment and creativity based on the 3-Ring Model of Giftedness by Prof. Joseph Renzulli. Gifted learners are more willing to ask questions and express their views in Mathematics whereas the high achievers concern more to fulfill teachers' requirement and unwilling to think and analyse the problem at a deeper level. The observation provides a useful reference for teachers in the identification of gifted students as well as curriculum planning and design in future gifted programmes.</p>
Download	<p>Worksheet 1 (pre-test questions) Worksheet 2 Evaluation Worksheet (post-test questions) Student Evaluation Questionnaire Powerpoint</p>