Abstract

The main purposes of this research are to understand the connotation and definition of PISA Mathematical Literacy, according to the analysis of the item forms and the distribution situation of those assessing mathematics achievement testing questions, probing into the mathematics achievement and the gender differences of the student of the secondary school in Macao, as well as the relationships between the personal factors and student performance on mathematics.

The object of this research is that 631 girl students and 619 boy students which up to a amount of 1250, participating in the PISA-2003 assessment. All these secondary school students aged from 15 years and 3 months old to 16 years and 2 months old.

The instruments for this research are mainly the PISA-2003-assessment and the student's questionnaire, so first is to pick the student's cognitive file and student's personal file from OECD web-site, and fetch the materials of Macao, also download relevant excel tables and sample questions. Forming charts by Microsoft Excel and running SPSS13.0 to carry out statistical analysis. The conclusions of this research are as follows:

1. PISA Mathematical Literacy can be assessed via testing, so as to assure the 15 year-olds students possess confirmation and understanding of the mathematical function in the society, and also the abilities of making mathematics judging and applying mathematics effectively with abundant foundation.
2. Questions for testing the moderate proficiency form a highest proportion in the PISA-2003 assessment, questions for testing high proficiency centralized mainly on "Space and Shape" and "Change and Relationships", questions with relatively high difficulty appear also in "Change and Relationships", more than half of the short response questions distributed to "quantity", the relatively easier multiple-choice question falls in "uncertainty" with almost half of the total amount.
3. Macao ranks the ninth position among the 41 countries, and the highest and lowest ranks are sixth and twelfth respectively, obtained an average mark of 527 points in the mathematics scale. Item response result reveals there are 4.3% of students reached the

highest level 6, 13.8% at level 5, 23.7% at level 4, 26.8% at level 3, 19.6% at level 2, 8.8% at level 1 and 2.3% below level 1.

4. There is significant difference between the girls and the boys in the four mathematics areas, and the gender gap ranked third among all other countries. In the overall mathematics scale, with the highest proficiency at level 6, the boys exceed 3.8% than girls, whereas the difference is 10.7% at level 5 and 2.0%at level 4 , but to the level 3, the girls obtained a higher proportion of 6.1% than boys, and at level 2, level 1and below level 1, girls exceed the boys with 5.5%, 0.6% and 0.1% respectively.

5. Relationships between learner characteristics (index) and student performance in mathematics(achievement):

"Self- efficacy" significantly related to the performance in mathematics.

Boys significantly higher than girls.

"Self- concept" significantly related to the performance in mathematics.

Boys significantly higher than girls.

"Interest in and Enjoyment" significantly related to the performance in mathematics.

Boys significantly higher than girls .

"Elaboration Strategies" significantly related to the performance in mathematics.

Boys significantly higher than girls.

"Anxiety" significantly related to the performance in mathematics.

Boys significantly lower than girls.

"Memorization Strategies" significantly related to the performance in mathematics.

Boys lower than girls, but not significant.

"Control Strategies "is not significantly related to the performance in mathematics.

Boys higher than girls, but not significant.

"Instrumental Motivation " is not significantly related to the performance in mathematics.

Boys significantly higher than girls.