GENDER MATTERS?

For the past few decades there has been an increasing interest in the different educational experiences, success and eventual outcomes that prevail for males and for females. The interest in this area was fuelled in part by a perceived lack of interest and success of females in a number of areas of schooling – notably mathematics and the physical sciences. In more recent times there has also been a focus on the lack of engagement and success of males, especially in the area of reading.

Educational policy has to take into account the existence of gender differences in performance to be effective in promoting quality student outcomes and equity. This report draws heavily on the OECD’s Programme for International Assessment (PISA) where it has been found that female students do better in reading (OECD, 2001) and male students do somewhat better in mathematics (OECD, 2004). In science, the picture is more complex. It has been found that student attitudes and engagement explain, in part, gender difference in mathematics and reading, a finding that, by itself, can foster a better understanding of how students learn and thereby help design more effective educational policies (OECD, 2007a).

This report will look at the development of gender related issues during the years of childhood and adolescence. The report will:

- consider briefly gender differences measured outside the PISA assessment programme;
- review the knowledge gained about gender related issues from PISA 2000 and PISA 2003 when reading and mathematics respectively were the major domains of assessment, with attention also paid to the relationship between student performance and student attitudes;
- consider in more detail the results from the most recent PISA survey, PISA 2006, when science was the major assessment domain, considering also student attitudes to science and the environment.

Why study gender differences?

There are at least three reasons to study gender differences: i) to understand the source of any inequalities; ii) to improve average performance; and iii) to improve our understanding of how students learn. Gender differences point to areas where student background and characteristics significantly affect student performance. Understanding what drives differential student performance can foster the design of effective educational policies to address quality and equity concerns. Why do female and male students perform differently? What drives gender differences? Is there a need for gender specific policies? Are there specific policies that would improve male or female student performance? These are some of the questions that can be analysed by looking into gender differences.

The imperative for gender equity can be seen in a number of lights. Firstly there is a moral reason to ensure that one of the sexes is not disadvantaged compared to the other. The disadvantage may be the end result of many years of treatment based on culture, religion and tradition. The second imperative to raising the performance of one of the sexes to be similar to the other is the concomitant increase in economic and social benefits that this will bring. Belfield and Levin (2007) calculated the costs and benefits associated with an increase in education level (as measured by high school graduation). They found that there are both private benefits to the individual who graduates and fiscal benefits to the taxpayer through higher tax revenues because of increased earnings and lower government expenditures on health, crime, welfare, remedial education and other public services.

The countries with the smallest number of gender differences in performances and attitudes (Table 3.21, OECD, 2007a) include Portugal, Poland, Belgium, Switzerland, Ireland, Mexico, the Slovak Republic and
Spain. In these countries it may be that efforts to improve student performance need to be targeted at both males and females, whereas in countries with a larger number of gender differences – for example the Netherlands, Iceland and Norway – it may be more useful to focus on one of the sexes.

**Overview**

This report begins with a short summary of gender differences from early childhood through to labour market participation. A discussion of how PISA can inform the consideration of gender differences follows. A brief section reviews gender differences in reading from PISA 2000 and in mathematics and problem solving from PISA 2003. A discussion of science in PISA 2006 follows, including information derived from the computer based assessment of science in PISA 2006. This section also includes discussion of parents’ perceptions, and of the relationships between performance and socio-economic background, single-sex and mixed-sex schooling, students’ attitudes to school and the amount of time that they spend on homework. The report also looks at trends in some of these relationships over time.

In summary, the report concludes that there are significant gender differences in educational outcomes, and these appear as students grow older and gain education and labour market experience. Despite differences in the structure of the brains of females and males, there is no conclusive evidence that these differences lead to later differences in educational outcomes. There is some evidence of gender difference in early educational experiences but they are confined to reading. As students progress in their education, however, gender differences become more pronounced. In addition, labour market outcomes show significant earning gaps in favour of males.

**WHAT DOES THE LITERATURE SAY ABOUT GENDER DIFFERENCES FROM EARLY CHILDHOOD TO THE LABOUR MARKET?**

**The structure of the brain**

In recent years there has been much interest in investigating potential links between the structure of the brain and differing educational outcomes for males and females. The OECD report, *Understanding the Brain: The Birth of a Learning Science* (OECD, 2007b), synthesised progress on the brain informed approach to learning (that is a detailed consideration of the relationship between the structure of the brain and a child’s capacity and approach to learning) and addressed a number of key educational issues. There are, indeed, functional and morphological differences between the male and female brain. The male brain is larger, for instance, but when it comes to language, the relevant areas of the brain are more strongly activated in females. Determining the importance of these differences in structure is extremely difficult. No study to date has shown gender-specific processes involved in building up the networks in the brain during learning.

**Primary education**

Small gender differences appear at early stages of education. Universal primary education is widespread in most countries and few gender differences appear in attainment, that is, in terms of the proportions of males and females completing primary education. In terms of performance, on the other hand, international assessments of primary school students show significant gender differences in reading in favour of females. On the other hand, there are few gender differences apparent in mathematics and science.

**Reading at grade 4 (PIRLS)**

The latest cycle of the Progress in International Reading Literacy Study (PIRLS) conducted by the International Association for the Evaluation of Educational Achievement (IEA) took place in 40 countries in 2006 (including 19 OECD countries and 10 non-OECD countries and economies which also participated in PISA 2006). The target population was fourth-grade students.