

In this part of the presentation I will argue that equity and quality are intrinsically related when we use them to make judgements about the status of mathematics education and educational reform. I will do that using three arguments: a pragmatics argument, an argument based on values and lastly an argument based on ethics.

### **Pragmatic Argument**

Before we understand the relationship of the two concepts we need to articulate how they are different.

Concerns about quality could be about two things.

- a) Doing “better” mathematics or
- b) Increase the “achievement” of students in that mathematics.

I will comment on the first meaning a little bit later. Quality as achievement is often based on the “mean” performance of students on a distribution of scores measured in some way.

Equity, on the other hand, raises the question who is learning and who is being excluded. Mostly, it is concerned with the lower end of the distribution (but sometimes at the upper end as in the gifted and talented). Equity concerns are usually about the “variation” - **In particular variation that is not caused by natural ability or interest, but due to background or opportunity.**

Here I will argue that attempting to reform mathematics education on either criterion must necessarily involve concern about the other one.

{SHOW GRAPH 1 }

A concern about equity with no consideration about quality runs the risk of “dumbing” down the curriculum. While it is valid, and essential, to look at achievement and participation, an uncritical sacrificing the quality for equity’s sake does not achieve the aim of either.

{SHOW GRAPH 2 }

Conversely, a concern about quality with no concern about equity may lead, as an extreme case, to “elitism”. One can imagine if increasing means is your only aim, and then by increase investment in the achievement of the highest achievers might be the most efficient way to increase “quality” as mean performance. Of course, this will be to the detriment of the rest - or the majority of the population.

Fortunately research support that the two agendas can be enhanced at same time. Due to short time, I will give one example. Productive Pedagogies reform in Australia demonstrate how a) quality concerns can be combined with equity concerns can be combined within the same framework for teaching and b) that quality teaching improves the educational achievements of all students, however the least advantaged benefit the most (Hayes, Mills, Christie & Lingard, 2006). Hence research points out

that the concerns about equity can best be met by concerns about quality of teaching. I don't want to be misunderstood here. One can not assume that improving quality will *automatically* lead to more equity. The realisation of more equitable mathematics education remains a great concern worldwide as a great challenge for our profession. Resources and direct action to provide equitable access to mathematics remain essential. However, research point out that it is possible to hold the two agendas together and we don't need to sacrifice one for the other.

To summarise, value judgements about the “well being” of mathematics education should be based on a combination of quality and equity. To pursue one without the other is not only **misguided** (by failing to deal with significant determinants of participation and achievement in mathematics) but also **counterproductive** (in leading to results contrary to what we are aiming to achieve).

I will now turn to a more theoretical discussion of the significance of both agendas by locating them within the discourse of values in mathematics education.

### **Question of values**

I realise when we talk about values in an international context, one runs into the risk of generalising values across cultures and societies. However, it seems to me there are two sets of values that are quite general in the literature and are shared by many societies.

Sometimes achievement is valued for achievement's sake. Take the example of the world's fascination with sports! For somebody who has no interest in competitive sports what so ever, I always find it a great curiosity to see the excessive amount of money and resources most countries spend on being Number 1 in national and international competitions. What does this have to do with mathematics education? Perhaps very little. However, take the public reaction illustrated by the media about scores of countries in international comparisons such as TIMSS. Of course I am not arguing that such activities have no contributions to make to the international status of the discipline. We will see some great benefit from such comparison in the following presentation. However, it seems to me that often the media and politicians care more about how a country compares with other countries than asking the more difficult questions such as what kind of mathematics is needed by our society and who is responsible for such an achievement and who is excluded.

Our concern about quality reflects other, more extrinsic values. Most policies and curriculum documents around the world reflect the value of the good things that quality mathematics education can bring to the individual and to society. We value mathematics because it leads to some high status jobs and to the technological developments in society. Undauntedly, it does that.

However, many educators from the critical mathematics movement have pointed to other extrinsic values that quality mathematics education can also provide. Again due to time limitations, I will mention one example. The work of Eric Gustein and his collaborator, has demonstrated how mathematics education based on the social conditions of Latino students in the USA, can lead the students to not only learn the school mathematics from which they are often excluded, but also learn about their

social conditions and ways to fight back their exclusion. It is a mathematics designed to allow students not only to read their world but also to write the world. Is this what we call mathematics education of high quality? If not, then we need to continue talking about what the term 'quality' means to us.

Similarly, concerns about equity in mathematics education reflect intrinsic and extrinsic values that many of us hold. Perhaps, the pioneering work of many of our women colleagues, many of them are here with us today, have shown us the way how concerns about exclusion combining research and political action can lead to changes of patterns of participation and achievement. Such concerns have shown the way to a multiplicity of other equity groups excluded based on ethnicity, culture language, Indigeniety and so on. Here, I follow the argument of Leone Burton who argues that social justice is a more comprehensive agenda than equity in mathematics education. We value social justice for social justice sake.

Similarly, concerns about equity and social justice reflect other extrinsic values that equitable participation and achievement brings to any society. I have in mind here values such as social cohesion, and harmony, peace as well as economic benefits. The message from educational economists have pointed out that if a society considers that achieving equity is costly, they should realise that the cost of inequality is exponentially more serious.

In short, making judgements and planning action about educational reform the two sets of values come into play. However, are we satisfied by establishing quality and equity concerns within the discourse of values? It seems to me there remain two problems.

1. Values are socially constructed and can vary from one culture to another and from one time to another. Further, values often are in conflict with each other, and action towards one may lead to a sacrifice of the other. Moreover, and perhaps because of that, values do not lend themselves to a criteria for evaluation and critique.
2. As Skovmose argued, we live in times of uncertainty. The thinking that to improve situation A you need to do B is often is often far too simplistic and not useful. There is a quotation that is attributed to Foucault "most of the time I know what I do. Sometimes I know why I do it. But only rarely do I know what I do does". Skovmose goes on to argue that in the age of uncertainty the only option we have to guide our action is sense of responsibility of one to the other.

This construct of responsibility brings us to the heart of the discourse on Ethics.

### **Foundation of Values in Ethics**

In mathematics education, and general education, ethics is not often used to discuss issues of policy and curriculum development. With the rise of scientific rationality, ethics was often associated with questions of morality, dogma, codes of behaviour and legal imperatives and is often seen as belonging to the domain of metaphysics rather than philosophy proper. This avoidance to talk about ethics is paralleled in western

postmodern philosophy, with its avoidance being normative and essentialist, and its being more concerned with ontology than meaning.

However, this avoidance to deal with ethical discourse in the west is slowly dissolving. The post-ontological philosophical writings of Levinas (1969, 1997) have been instrumental in the re-introduction of ethics within philosophy by establishing ethics as the *First Philosophy*. For Levinas, ethics is before any philosophy and is the basis of all philosophical exchanges. Ethics is based on a relation to the other that precedes understanding, a relation which he calls “original relation”. Levinas argues that to be human is to be in a relationship to the other, or more accurately, in a relation *for the other*. This relation is even prior to mutual obligation or reciprocity.

The concept of responsibility is central to any ethical discussion. In Western Australia, a group of colleagues looking at implications of ethics to mathematics and science education. We have adopted the origin of the term responsibility as response-ability. We construct the act of teaching and learning as primarily an action towards increasing the response-ability of the students in meeting the demands of life now as well as in the future.

What do we gain by this approach to talk about quality and equity from ethical perspective?

Very briefly

1. From a response-ability perspective the discourses of quality and equity are necessarily united. To meet our response-ability to the students we can not differentiate between one and the other.
2. This focus on responsibility establishes social justice concerns as a moral obligation, rather than charity, good will or convenient politics. In other words, adopting a social justices approach places knowledge as a servant to justice; while an ethical approach places justice at the service of the moral.
3. Consideration of response-ability widens the agenda of quality mathematics education. From this ethical response-ability, intellectual quality is not simply measured from within mathematics as a discipline, and its use in technology and quality of life; but by its ability to develop powerful mathematics that enables the student, and adults to both *read* and *write* the world.

### **To sum up**

From an ethical perspective working towards quality and equity go had in hand and should be the focus of every body with any interest in mathematics education. This ethical stance, rather than being a normative criteria which dictates a particular line of actions in different situations, it establishes a means to reflect on action and policy towards the achievement of more equitable access to high quality mathematics education.