

Chapter 1: Goals of Mathematics Teaching

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‘A discussion of mathematical education, and of ways and means of enhancing its value, must be approached first of all on the basis of a precise and comprehensive formulation of the valid aims and purposes of such education. Only on such basis can we approach intelligently the problems relating to the selection and organization of material, the methods of teaching and the point of view which should govern instruction, and the qualifications and training of the teachers who impart it. Such aims and purposes of the teaching of mathematics, moreover, must be sought in the nature of the subject, the role it plays in practical, intellectual, and spiritual life of the world, and in the interests and capacities of the students.’

(The Reorganization of Mathematics in Secondary Education, 1923
(1970), p. 390)

ABSTRACT

This chapter attempts to analyse the justification and the goals of mathematics education from both theoretical and historical perspectives. Methodological issues related to the identification and reconstruction of the justification and the goals of mathematics education are discussed as well.

The chapter begins by setting the stage, also as far as terminology is concerned, and by asking ‘what are the issues?’, in order to discuss the relevance of studying the justification and goals of mathematics education. Particular emphasis is being placed on the essential distinction between descriptive/analytic and normative issues.

The main part of the chapter consists in a descriptive/analytic, internationally orientated, survey of the development of the goals of mathematics education during the past century or so, as manifested in major contributions to and documents of curriculum change as well as in contributions to the didactics of mathematics. Attempts are being made to relate the development of the goals and justification of mathematics education to the changing roles of mathematics and mathematics education in society.

The chapter concludes by placing the discourse at issue within the broader context of contemporary preoccupations and concerns in the didactics of mathematics.

1. INTRODUCTION. WHAT ARE THE ISSUES?

1.1 Remarks on scope and terminology

In a way, most of the considerations in the present chapter pertain, I believe, to mathematics education in general, i.e. across the whole range of mathematics education from kindergarten to graduate studies. However, in order to avoid futile discussions about the extent to which the considerations are relevant to the teaching and learning of mathematics for various special categories of pupils and students, perhaps mainly at advanced levels, let me confine this chapter to dealing with the majority of pupils and students in mainstream primary and secondary education, and in tertiary education not preparing for specifically mathematical professions.

Terminological issues are mostly tedious and boring. Nevertheless, for a scholarly or scientific discourse to be serious, in fact possible, it is essential that at least the key entities and concepts of that discourse are reasonably clear to those involved. This is particularly true with a field like mathematics education in which transparency and clarity are not easily achieved, let alone to be taken as a matter of course. So, please bear with me during the few pages it takes to set the terminological stage.

Before dealing with the goals of mathematics education we need to spend a few remarks on some closely related notions which we shall also be using in this chapter: 'reason', 'justification', 'argument'. By a (real) **reason** for providing mathematics education to students within some segment of the educational system we understand a driving force, typically of a general nature, which in actual fact has motivated and given rise to the existence (i.e. the origination or the continuation) of mathematics teaching within that segment, as determined by the bodies which make the decisions (including non-decisions) in the system at issue.

Reasons for mathematics education need not be explicit, well defined and articulated, let alone agreed upon and stated in public. More often than not, reasons are implicit, indirect, fuzzy and vague, and form part of a complex conglomerate of other reasons, societal or group interests, cultural and political ideals, and so on. They include also, in fact quite frequently, impersonal societal forces, of which inertial forces are particularly relevant in this context. Only in rare cases, therefore, do we have direct access to reasons for mathematics education. For such access to be possible, it is not sufficient to identify explicitly stated and formulated reasons which seem, at first sight, to express the underlying motivation of the bodies equipped with the power to establish, continue or discontinue mathematics education. The mere fact that some explicitly stated reason for mathematics education can be identified, say in official documents, does not in itself make it a *real* reason. For this to be convincingly established, a thorough analysis of the genesis, nature, role and status of the said reason has to be carried out. In other words, it requires in-