1980s INTRODUCTION

MATHEMATICS EDUCATION IN ALBERTA IN THE 1980s

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The 1980s produced a great deal of change in mathematics education in Alberta, both at the department level as well as in classrooms across the province. Some of this change occurred because of a wave of general education reform around the world, but some was a result of local economic, political, and social factors here in Alberta.

Globally, industry was changing in nature; there was a greater demand for workers in high-skilled positions and less need for low-skilled workers. The world was becoming more information-based and less industrial-based.

Provincially, many of the changes were related to assessment. In 1982, the Department of Education introduced the Achievement Testing Program for grades 3, 6, and 9 to assess the core subjects of language arts, mathematics, science, and social studies. As well, in 1984 the government brought back grade 12 examinations, formerly called departmental exams, now known as diploma exams. The English 30 or 33 exam became a requirement for high school graduation, and exams were developed for the Math 30 and 33 courses. Because of all these new assessment tools, the

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government developed a new student information system to provide accurate analysis of student data and information to policymakers.

Also at the provincial level, teacher mathematics organizations became more robust and assertive; they didn't just deliver information about curriculum and assessment, they pushed for more input into all issues related to mathematics education.

Many jurisdictions in Alberta moved away from set textbooks from major publishing firms in the early 1980s for junior high mathematics courses to a softcover locally produced, consumable workbook as their main teaching and assignment source. These workbooks contained very little in terms of instruction and virtually no context for mathematics concepts; instead, they emphasized repeated practice of procedural skills. The desire of school districts to save money on resources might have been the main force behind this. Later in the decade, the move to provide more practical applications of mathematics concepts grew and led to the government producing application and problem-solving related booklets in the early 1990s.

The 1980s still saw many students dropping out of mathematics courses. Not many high school students signed up for advanced mathematics courses like calculus or analytical geometry, and the vast majority of those who did were male.

Demographic shifts and population changes made school closures a large concern in many areas of the province during the 1980s. To counter reducing student numbers, many school districts began to introduce focus programs, such as the International Baccalaureate program at the high school level. This was successful in attracting students from outside school catchment areas and increasing numbers to a viable level. This trend later progressed to include a great variety of focus programs and sports academies, and students were not bound to their neighborhood schools anymore. This model was first introduced by Edmonton Public Schools and was later copied by many jurisdictions in North America, and was a result of the move to a site-based management style, which was piloted in the late 1970s and fully incorporated in the early 1980s. As Joan Cowling, former board chairperson of Edmonton Public Schools, said in 1995: "It was around 1984 or 1985 when the concept of school-based management seemed to become institutionalized and have taken on a life and philosophy of its own" (cited in Delaney, 1995).

The 1980s also saw huge changes in technology in education with the development of microcomputers at prices that schools could afford. The excitement of this new tool led many school districts to begin bringing computers such as the Commodore 64, Apple IIe, and Vic 20 into their classrooms in the early eighties. In mathematics classes, these computers were primarily used for interactive programs written in BASIC language to deal with concepts related to number. Some progressed further to look at geometry

concepts through the use of the LOGO program with its iconic turtle on the screen. This program was very successful, especially with young children and physically disabled children, and was also popular with teachers. Dr. Dale Burnett, of the University of Lethbridge, said in his article that the reasons for this were threefold: synthesis (the necessity to build on previous knowledge), self-control (the user had some control in the setting of tasks and how to approach them), and sharing (students helping students and feeling good about it, as opposed to working in isolation on a task). Floppy disks became the norm for program and data storage, although many teachers battled with cassette drives for this purpose. Technology for education changed rapidly and, later in the decade, IBM made its computers more affordable and applicable to education. Computer processing classes became widespread as did BASIC programming and word processing. Spreadsheet programs such as Lotus 1-2-3 became a popular area of study, and spreadsheet work was incorporated into mainstream mathematics curriculum later in the century. The universities around the province provided many in-servicing and professional development courses for teachers to learn how to use microcomputers in their mathematics classrooms. Dr. Milt Petruk at the University of Alberta was one of the leaders in this area.

The 1980s also saw the rising importance of statistics in secondary mathematics curriculum. Historically, this branch of mathematics had always been treated poorly, and its proponents had to fight for it to be treated the same as other branches in the mathematics field. With the growth of the consumer society, research companies, and an information-based global focus, the greater presence of market surveys and opinion polls in our lives pushed the need for population study and sample surveying as mathematics topics in schools. An indication of the new respect for statistical topics is evidenced in this comment from Dennis Haack, in the article entitled "Statistics in the High School": "But statistics has become more than a research tool. Statistics has become a language in its own right. We are bombarded by numbers, but what do the numbers mean?" (p. 7). The interpretation and understanding of statistics were seen as more important than the actual calculation of statistical measures.

A great deal of attention in the 1980s was directed at trying to make mathematics more relevant to girls. Many educators attempted to dispel the myth that females are innately poorer than males in mathematical ability. Conferences, NCTM initiatives, and much research were devoted to increasing female participation in all aspects of mathematics, including employment in scientific and mathematics-related careers. This movement was quite successful as evidenced by the increase in the number of females in mathematics classes and pursuing related postsecondary programs and careers through the end of the 20th century and beyond.

The search to understand more about how people learn and how to make mathematics teaching more relevant spurred the constructivist approach to teaching. Professors like Dr. Sol Sigurdson, at the University of Alberta, tried to help teachers understand the logic behind the constructivist approach to learning. As Sigurdson wrote in an article entitled "A Constructivist Approach to Teaching Mathematics," "The main tenet of this view is that all learners actively construct theories, no matter how minor, about what is appropriate action for responding to any particular situation" (p. 8). This was an indication that the processes of learning and teaching were being looked at from a more scientific point of view: recognizing relationships among all mathematics topics, acknowledging the many-faceted aspects of even the simplest of mathematical concepts, and paying more attention to what the learner brings to the situation.

By the end of the decade, mathematics curriculum had shifted to a three-pronged focus: intended, implemented, and attained. This approach came out of the Second International Mathematics Study of 1989. "Intended" referred to the curriculum developers, "implemented" to how the curriculum was realized in classrooms, and "attained" to how the curriculum was demonstrated by student achievement and attitudes.

In conclusion, the decade of the 1980s saw a great deal of change affecting mathematics education in Alberta, some of that change on the global stage, and much of it more local, at the provincial and district level. Great progress in mathematical resources occurred late in this decade. Technology use in mathematics classes made great inroads and was definitely here to stay. Overall, I believe that great strides were made in this decade to make mathematics education more interesting to a wider population and more relevant to the world around us.

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