

Administrative Report regarding the Notice of Motion to implement non-semestered Grade 9 Mathematics and Physical Education courses in semestered secondary schools

Administrative Recommendation:

Based on the research and the current level of responsiveness by schools to maximize student success, the administration does not support the Board motion. The current focus should remain on improving instructional practice and enhancing the differentiated use of transformational practices in a K to 12 approach. The Peel District School Board continues to emphasize that literacy and numeracy should not be confined to certain classrooms, but rather be a focus that is embedded within all subject areas.

Background:

At the Regular Meeting of the Board held on September 23, 2008, the Board considered the following Notice of Motion, tabled by Trustee Kavanagh.

"There is evidence of a better way to structure the teaching, learning and retention of mathematics in a semestered secondary school. Currently in Peel, semestered students can have math in the fall of grad 9 and then not have math again until the winter of their second year (grade 10) year. This has been observed to be a significant barrier to mathematical learning and retention. Long intervals between learning are a proven barrier. Math is often described as a language and it would be difficult to learn and retain a new language if it was taught in this manner.

Physical Education (P.E.) should be reinforced as often as possible. In fact, in elementary years, the Ministry enforces "DPA" (daily physical activity). Grade 9 P.E. is mandatory, but in a semestered school, a student would only receive P.E. in 1 semester.

Therefore, it is proposed that grade 9 math and physical education be twinned as year-long, alternate day courses within Peel semestered secondary schools. Other grade 9 courses would remain on the regular semester schedule.

With the advent of sophisticated timetable models, this should be relatively simple to implement. It is likely that there would be some additional financial resources required for texts, etc., but this is unlikely to be insurmountable.

Therefore, be it resolved that Board staff develop an implementation plan for the concept and that the plan be implemented in time for the 2009-2010 year."

Following a brief discussion, the Board referred the motion to the administration for a report on staff time required to prepare a detailed report on the implications of implementing non-semestered Grade 9 Mathematics and Physical Education courses in the Board's semestered secondary schools.

Prepared and Submitted by:

Chuck Waterman, Superintendent of Instructional Programs Support Services

Judith Nyman, Associate Director of Instructional Support Services

Report:

The Peel District School Board prides itself on being a progressive Board that is data driven and results oriented. The Report Card for Student Success, the board's strategic plan, has high expectations for staff and students as a key goal. The organizational work in this goal is directly aligned to the work in the classroom through the school success planning process. Every school, based on a review of their perception and achievement data, develop SMART goals(s) that are reflective of their school community and student needs. This has allowed schools to individualize their approach to support student achievement within an identified "greatest area of need". This school-based process has ensured that the Peel District School Board does not utilize a "one-size fits all" approach.

In September 1999 the OAC year was eliminated and the completion of the 30 secondary credits for an Ontario Secondary School Diploma was compressed into four years from five. Within the 18 compulsory credits only one Health and Physical Education is required and 3 Mathematics credits are required, with one being a senior level mathematics credit (Appendix A). Although students may remain for four and a half or five years, the majority of students do graduate within four years. This has affected the degree to which students can select a variety of optional courses especially in the Arts area. As a result, it is even more important than ever to allow students to individualize their program to reflect their own personal interests and areas of strength.

Current Timetabling/Scheduling Approaches in Peel Schools:

The Peel District School Board has always encouraged schools to look at ways in which they can offer a wide range of programs for students. Over the years Peel has developed a selection of Regional Programs in the Arts, Cooperative Education, Strings, Science and Technology, International Baccalaureate, International Business and Technology, Flexography and Heating, Ventilation, Refrigeration & Air Conditioning. In addition, the advent of Specialist High Skill Majors and Pathways will allow students to focus on knowledge and skills that are of particular importance in certain economic sectors and to obtain certifications recognized in those sectors. This requires schools to package programs within the school timetable to ensure that students can select courses for the post secondary destination of their choice whether it be apprenticeship training, a college or university program or the workplace.

A review of our 32 secondary schools already demonstrates individual schools being responsive to student need and interest. There are currently non-semestered schools that offer semester courses within their timetable:

- Careers and Civics, which are half credits;
- ESL courses to allow students to progress through two levels of ESL in one year as appropriate;
- Advanced Functions Mathematics course and the Calculus and Vectors course as students benefit from these being offered sequentially rather than concurrently.

There are currently semestered schools that offer non-semestered courses:

- Arts courses such as band, jazz, vocal jazz, repertoire, dance etc.;
- Learning Strategies courses
- A number of IB courses
- Leadership and Peer support courses

Schools are committed to reviewing their student progress and program offerings in order that they maximize the opportunity for success for each and every student.

Overview of the Research on Semestering:

Three large research synthesis studies on the benefits and challenges of semestered and non-semestered school organizations were reviewed. The first, a two-part study from 1997, *What We Know About Block (Semestered) Scheduling and Its Effects on Math Instruction*, was authored by Steven L. Kramer. The second, *An Analysis of Research on Block Scheduling*, from Spring

2006, was written by Sally J. Zepeda and R. Stewart Mayers. Combined, these studies reviewed 114 research projects and the findings clearly supported semestered over non-semestered school organizations.

When semestered school organizations were compared with non-semestered school organizations, semestered schools offered enhanced opportunities for student success in the following key areas:

- school atmosphere and climate for learning
- fewer suspensions and/or discipline referrals
- improved pupil-teacher relationships
- improved student attendance
- reduced failure rates
- greater benefits for at-risk students (credit completion, grades)
- higher course completion rates
- improved student grades and averages
- students enrolled in more math courses

In a semestered organization, students enrolled in more math courses than in a non-semestered organization. On the critical issue of "content loss" between semesters, the studies indicated that students with an extra semester time gap did have more difficulty recalling recently learned concepts, but they recovered quickly during the subsequent math course, typically within a couple of weeks.

With the significant positive effect that semestered organizations present in enhanced conditions for the climate for learning, with improved grades and averages, and with no negative effects on grade results in all subjects, including mathematics, the evidence does not support a change to a non-semestered structure for mathematics education in our secondary schools.

The College Mathematics Project (CMP) 2007 Final Report (Appendix A) was the report referenced in the delegation on September 9, 2008, as evidence to support the delegates assertion that "there is something wrong with the delivery of math studies". In responding to a question about research related to semestered versus non-semestered organizations, the delegation said that this was the only evidence he had to support his contention that the solution to improve math results is to move to a non-semestered delivery of mathematics.

To put the delegate's comments in context, the conclusions of the CMP 2007 Final Report were as follows:

- Students who take more advanced math courses in grades 9 and 10 do better in first-semester college math courses, and
- Changing these results requires students to select secondary school courses based on the most appropriate preparation for their desired goals/destinations.

While the delegate inferred that the CMP 2007 Final Report supported his contention that non-semestered math scheduling was the better way to go, there is nothing in the data of the Report that can be used to either reach or support this conclusion. For example:

- semestered and non-semestered schedules were not included as variables in the study; therefore, conclusions about the impact of semestered vs. non-semestered schedules on first-semester college math grades is not possible.
- the study attributes student results in first year college math courses to the type of math course taken (more advanced/academic vs. applied) in secondary school, not whether they occurred in a semestered or non-semestered organization;
- there was no differentiation in the study of the students in the study – students from Ontario were included with students from other jurisdictions – the determining factor for being in the study was enrolment in a first year college mathematics course.

Most significantly, the delegation spoke to the math curriculum that CMP 2007 addressed as if it were the current math curricula. In fact, new mathematics curriculum policy documents were released in Ontario during 2006 – 2007. The York Seneca Institute Study is based on grades from 2006, prior to the release of the revised Mathematics curriculum. The newly defined courses, particularly those aimed at preparing students for college and the newly defined pathways, should have an impact on the overall increases in student success in math courses at college beginning in 2008.

Professional Learning Opportunities in Mathematics

The importance of effective, ongoing professional development programs for teachers of mathematics is stressed in the following Ministry of Education documents and is supported in research as key strategies to improve outcomes for students:

- Leading Math Success, Mathematical Literacy Grades 7 – 12
- The Report of the Expert Panel on Student Success in Ontario

As Peel secondary schools establish their Greatest Area of Need (GAN) through school success planning, a significant number have identified "students at risk" of not earning 8 credits in grades 9 and 10 as the greatest area of need. Mathematics is one of the subjects for which these students are most likely to not earn a credit and this has become a common focus for both the secondary school and their feeder schools. A key focus in the professional learning offered for Peel educators is how to embed the Transformational Practices in their daily work with students. Much attention was given to the "big ideas" inherent in the expectations, the teaching and learning of concepts and skills in mathematics using strategies that include rich problem-solving situations, the use of thinking tools such as manipulatives and technology, purposeful talk about mathematics, the seven mathematical processes, and the three-part lesson design to support mathematical reasoning.

Some of the professional learning opportunities available to teachers of mathematics in the Peel District School Board are similar to the types of strategies utilized at Cardinal Leger Secondary School, which was identified by the delegation. They include:

- Sharing Nspiration Mini-Conferences (Spring 2008, Fall 2008, Spring 2009) – focus is on professional learning and classroom practices related to the use of the TI-Nspire CAS handheld units and software programs – also, hope to again support interested teachers who wish to participate in TI-Nspire CAS institutes in the Summer of 2009
- meetings of Peel Mathematics Heads Association (PMHA) – starting with the last meeting in May, 2008, there will now be time (one to two hours) devoted to professional learning and dialogue – this school year, heads will also have the opportunity to invite a department member to join them for these professional learning components of the meetings – topics are aligned with Transformational Practices and Student Success/Learning to 18
- series of book talks based on the resource "MathThatMatters" by David Stocker – combines concepts and activities related to Social Justice, Critical Literacy, and Mathematics (hope to plan and present the talks with Marta Mulhern, Mary Samuel and a few interested resource teachers)
- OAME - Leadership Conferences (February 2008, February 2009)
(OAME – Ontario Association for Mathematics Education)
- OAME - Annual Conferences (May 2008, May 2009)
- annual CHAMP Fall Events (October 2007, October 2008) – numerous workshops available for secondary teachers
(CHAMP – Credit Humber Association for Mathematics Promotion; local chapter of OAME)
- TIPS4RM (Targeted Implementation and Planning Supports for Revised Mathematics) for Grades 7, 8, 9 Applied and 10 Applied – ongoing professional learning provided by resource staff – there are plans to once again have two TIPS4RM Institutes in July/August 2009

- there is regular, ongoing support provided by resource staff on numerous topics including effective use of thinking tools such as manipulatives and technology, assessment and evaluation, purposeful talk about Mathematics, etc.
- OISE Learning Consortium – teams from selected schools
- Critical Thinking Team – current involvement of two secondary school teachers; with intent to expand learning to other secondary school teachers
- ONAP/PRIME – possibility that there will be professional learning opportunities for secondary teachers related to the use of ONAP/PRIME to support at-risk students, differentiated instruction, assessment driving instruction, and precision teaching

As Peel educators work to embed the Transformational Practices in their daily instruction, the opportunity to support and expand their professional development by means of these valuable and effective strategies is highly valued. An outstanding team of mathematics educators in Peel is dedicated to providing ongoing professional learning opportunities so that teachers may continue to enlarge their capacity for exemplary instructional practice in mathematics, with the goal of improved success for all students.

College Mathematics Project (CMP) 2008

The CMP 2008, co-sponsored by the Ministry of Education and the Ministry of Training, Colleges and Universities, is a project of the York/Seneca Institute for Mathematics, Science and Technology Education designed to:

- Analyze the mathematics achievement of first semester college students, particularly in relation to their secondary school mathematics backgrounds;
- Deliberate with members of both college and schools communities about ways to increase student success in college mathematics.

CMP 2008 extends the work of the past two years. The project now comprises 11 colleges in several regions of Ontario and the many school boards in those regions. The Peel District School Board is a participant in CMP 2008 and will participate in the GTA Invitational Forum on Friday, October 24 at Seneca College.

The Curriculum Context in Ontario

The Credit System

A credit is granted to a student in recognition of the successful completion of a course that has been scheduled for a minimum of 110 hours by the principal of a secondary school on behalf of the Minister of Education. In order to earn an Ontario Secondary School Diploma (OSSD), a student must earn a minimum of 30 credits, including 18 compulsory credits and 12 optional credits. Students must also complete 40 hours of community involvement activities and must successfully complete the Ontario Secondary School Literacy Test (OSSLT).

Since September 2005, two co-operative education credits can be counted toward the 18 compulsory credits.

Note: For students who entered grade 9 in September 2008, requirements for the Ontario Secondary School Diploma are currently under revision by the Ontario Ministry of Education.

Credit Requirements in Ontario Secondary Schools

Compulsory – 18 compulsory credits

English	4 credits
Mathematics	3 credits (at least 1 senior math credit)
Science	2 credits
Arts	1 credit
Geography	1 credit (Canadian)
History	1 credit (Canadian)
French	1 credit (French as a second Language)
Health & Phys Ed	1 credit
Civics	½ credit
Career Studies	½ credit

107

An additional credit in one of:

Group 1

English
 French as a second Language
 Native Language
 Guidance and Career Education
 Co-operative Education

Group 2

Health & Phys Ed
 Arts
 Business Studies
 Co-operative Education

An additional credit in one of:

Group 3

Senior Science
 Technological Education
 Co-operative Education

Optional Credits – 12 optional credits

In addition to the 18 compulsory credits, students must earn 12 optional credits selected from the courses listed as available in the course calendar.

Referred Motion re Delivery of Grade 9 Mathematics and Physical Education Programs

Recommendations:

Resolved, that the Board now deal with Resolution No. 08-315, which was referred to the administration at the September 23, 2008 Regular Meeting of the Board.

.....

(Note: Once the above motion is approved, the original motion will automatically be back on the floor.)

"Resolution No. 08-315

moved by Steve Kavanagh
seconded by Rick Williams

Whereas there is evidence of a better way to structure the teaching, learning and retention of Mathematics in a semestered secondary school. Currently in Peel, semestered students can have Mathematics in the fall of Grade 9 and then not have Mathematics again until the winter of their second (Grade 10) year. This has been observed to be a significant barrier to mathematical learning and retention. Long intervals between learning are a proven barrier. Mathematics is often described as a language and it would be difficult to learn and retain a new language if it was taught in this manner. Physical Education should be reinforced as often as possible. In fact, in elementary years, the Ministry enforces "DPA" (daily physical activity). Grade 9 Physical Education is mandatory, but in a semestered school, a student would only receive Physical Education for one semester.

Therefore, it is proposed that Grade 9 Mathematics and physical education be twinned as year-long, alternate day courses within Peel semestered secondary schools. Other Grade 9 courses would remain on the regular semester schedule. (With the advent of sophisticated timetable models, this should be relatively simple to implement. It is likely that there would be some additional financial resources required for text books, etc., but this is unlikely to be insurmountable.)

Therefore, be it resolved that Board staff develop an implementation plan for the above concept and that the plan be implemented in time for the 2009-2010 year."

Background:

At the Regular Meeting of the Board, held September 23, 2008, the Board referred Resolution No. 08-315 back to the administration for a report to be brought to the October 28, 2008 Regular Meeting of the Board on the staff time required to prepare a detailed report on the implications of implementing year long paired Grade 9 Mathematics and Physical Education courses in the Board's semestered secondary schools. The administrative report is brought forward to this meeting.

Prepared by:

*Nicole Fernandes
Board Reporter*
