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Editorial: Calculus counts in new economy

Feb. 6, 2006. 01:00 AM

Every nation in the world today is chasing the same elusive prize: to capture the promise and wealth of a new economy built on innovation and continuous technological change.

Even the richest country in the world knows it cannot take the preconditions of the new economy for granted. In his State of the Union address Tuesday night, U.S. President George W. Bush said: "We need to encourage children to take more math and science, and to make sure those courses are rigorous enough to compete with other nations."

Canada is one of those other nations, and the future well-being of Ontario, the country's industrial heartland, depends vitally on the ability of our children to master science and math.

And that is why Ontario residents should be concerned the provincial government is considering a proposal to drop calculus from Ontario's high-school curriculum. A curriculum review committee of academics and education ministry officials suggested last fall that calculus be taken out of Grade 12 and left for university to teach. The idea was floated because of concerns there was not time in the new, packed four-year high school program to teach it, as well as algebra, geometry and trigonometry.

Supporters of calculus argue that if science is the doorway to the new economy, then calculus is an essential key to unlocking that door.

Had Sir Isaac Newton not "invented" calculus, a branch of mathematics that deals with rates of change, he could not have uncovered secrets of the universe that are now synonymous with his name. Albert Einstein struggled for years with his general theory of relativity before a colleague suggested he learn tensor calculus, which enabled him to complete one of the greatest scientific achievements of the last century.

And what was true for these scientific geniuses is also true for university students today. First-year students cannot do physics without calculus. Engineering students cannot do circuit theory — the theory that underlies the workings of the cellphone, computer and digital camera — without calculus. Biology students need it to understand how diseases spread and how populations shrink or grow.

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University of Waterloo president David Johnson was not exaggerating when he told the government that Ontario risks becoming a "second tier" province if it eliminates high-school calculus.

And second-tier status is just another term for failure in the new economy on which Ontario's standard of living will depend.

Ontario cannot hope to compete in the future, when Bush is proposing to train 70,000 advanced high-school math and science teachers, bring 30,000 math and science professionals to teach in classrooms, and give early help to students who struggle with math.

Ontario Education Minister Gerard Kennedy won't just be settling a curriculum issue when he makes his decision in the next few days. He needs to do the economic calculus, which he can find in any advanced textbook on the theory of economic growth.

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