

Management Response to the Mid-term Review of the CRYSTAL Pilot Program

Overall Response and Action:

The CRYSTAL Pilot Program was created as a result of commitments stemming from NSERC's Vision, which was approved by Council in October 2003. The objective of the CRYSTAL Program is to provide a collaborative environment for researchers in the natural sciences and engineering, education researchers in the social sciences, education administrators in provincial Departments of Education and School Boards and teachers to work together to improve the teaching and learning of science and mathematics in K-12. A key part of the objective is to ensure that the results of the research would be available in classrooms as expeditiously as possible, either through curriculum revision or better teacher preparation. The CRYSTAL Program was established as a five year pilot, with funding of \$200,000 per year to each of five Centres. One of the Centres serves as national coordinating body to ensure that research results and best practices are shared among all of the Centres. A mid-term review during the third year of the pilot (the subject of this Management Response) was meant to provide NSERC Council with an assessment of the effectiveness of the program in order to determine a course of action following the completion of the pilot. Overall, Council found that the mid-term review was well done and that it provided useful input to its discussion on the future of the pilot program. Council accepted the conclusions of the mid-term review and found that they were consistent with its understanding of the program.

In parallel to the mid-term review of the CRYSTAL program, NSERC undertook a review of all of its programs as part of the federal government's Strategic Review process. This exercise requires departments and agencies to review all direct program spending on a four-year cycle to ensure their effectiveness and efficiency, and identify a minimum of 5 percent of their budget for potential reallocation to other federal government priorities. As part of this Strategic Review process, NSERC conducted a comprehensive review of all our programs according to the following criteria: (1) need and impact of this program on the community it serves; (2) federal role and fit to NSERC's mandate; (3) alignment with the government's S&T strategy; and finally, (4) value for money (efficiency and effectiveness), management performance and accountability.

The findings and conclusions from the mid-term review informed the Strategic Review process. As a result termination of the pilot program was recommended and accepted. The CRYSTAL program will be phased-out and funding for the five centres currently supported will not be renewed at the end of the current pilot. Existing funding commitments will be honoured, and no new competitions will be held.

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Mid-term Review Conclusions	Comments
<p>1. The CRYSTAL Pilot Program is making progress toward the achievement of immediate outcomes.</p>	<p>One of NSERC's goals in designing the CRYSTAL program was to promote collaboration among researchers from the NSE and education fields and require them to interact with the user community from the outset, to ensure that user needs were known and research results transferred as quickly as possible into the classroom. The mid-term review of the CRYSTAL pilot appears to confirm that this approach can be effective and can accelerate knowledge translation to the user community. While the pilot confirmed that this integral interaction with the user community did indeed accelerate transfer and use of knowledge, the scope of the pilot was too small and for too short a duration to have had a transformative effect on provincial education programs and practices. Also, the time cycle of curriculum reform is usually much longer (10-15 years). In cases where curriculum reform was taking place at the same time as the CRYSTAL project, as in the case of the province of Québec, interaction between the provincial Department of Education and the CRYSTAL Centre proved to be very close and beneficial. When out of synch, there was not always the same level of engagement and interaction.</p>
<p>2. The Centres are increasing the understanding of the skills and resources needed to improve the quality of sciences and mathematics, and the best ways to enrich the preparation of young Canadians in these foundation subjects.</p>	<p>The program was designed to focus on achieving near-term (resources and teaching strategies) and long-term (research) benefits in improved learning and teaching. The close interaction of researchers with teachers ensured that research projects addressed "real world" needs. The establishment of good working relationships among researchers, teachers, school boards and Departments of Education was meant to facilitate quick acceptance and use in the classroom of novel teaching strategies and resources. We accept the conclusion that the pilot demonstrated that these benefits were being achieved to some degree. This reinforces the value of going beyond academic research, and publication in scholarly journals, in achieving an effective knowledge translation strategy. This is clearly a "best practice" in any future activity of this nature.</p>
<p>3. The CRYSTAL Pilot Program has enhanced the capacity of education researchers to conduct science, mathematics and technology education research.</p>	<p>By its very design the CRYSTAL Pilot Program focused the research activities of the participating education researchers on science, mathematics and technology education research. Most of the education researchers were already doing, or were familiar with, work in this area, but the concentration of resources in a centre and the closer association with other centres and with in-service teachers and others in the education community (the "user" sector) fostered new perspectives, insights and greater appreciation of the practices and needs of those who would benefit from the research. We recognize that the small scale of the pilot project limited the impact to those directly supported.</p>

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<p>4. There is limited involvement of scientists and students from the natural sciences and engineering in Centre research, knowledge translation and outreach activities.</p>	<p>From NSERC's perspective, this was the most disappointing aspect of the CRYSTAL Pilot Program. The original hope was that natural sciences and engineering (NSE) researchers would collaborate with education researchers and that together they would interact with the user community. This appeared to happen to a limited degree, with some very dedicated and engaged individual researchers, but there was never the sense that the NSE community was actively involved in the program. The objective of improving the teaching and learning of science and mathematics in K-12 is certainly one that resonates as worthwhile in the NSE research community. One would expect that the importance of this objective would have generated more support and involvement among NSE researchers. This would need to be taken into account in any future activity of a similar nature, in terms of program design and addressing other disincentives.</p>
<p>5. Given the nature of the research being funded and the level of the involvement of natural sciences and engineering community, the continued funding and administration of the CRYSTAL Pilot Program solely by NSERC should be discussed by Council.</p>	<p>The analyses that were part of the Strategic Review exercise indicated that the CRYSTAL Pilot Program was attempting to address an important issue that has a direct bearing on natural sciences and engineering research. However, it was also clear that education research, even science, mathematics and technology education research, better fits within the mandate of the Social Sciences and Humanities Research Council. Education, curriculum reform and teacher training and effectiveness are areas of provincial jurisdiction. Hence, the results of this CRYSTAL Pilot Program mid-term review and of the parallel Strategic Review exercise lead to the conclusion that NSERC should consider carefully whether it should undertake this type of activity alone or at all.</p>