

Teacher Workshops Evaluation

Executive Summary and Recommendations

EXECUTIVE SUMMARY

An evaluation of the Calgary Science Network Teachers Workshop Program was conducted during spring 2008 by Terri MacDonald, Ph.D. Principal Consultant, Perception Research. This evaluation considered the effectiveness of CSN workshops over the last five years with respect to promotion, format, content, resources, impact and value. A total of 412 CSN stakeholders participated in this evaluation, including CSN staff (2) and the board of directors (10), teacher participants (325), and teacher-scientist presenters (75). 325 teachers and 75 presenters completed an online survey. Supplemental focus groups and interviews were conducted with teachers, presenters, CSN staff, and the CSN board in order to further illuminate initial findings from teacher and presenter surveys. The research methodology also included an analysis of findings from formative assessments (2003-2008) and a literature review focused on effective science-based professional development programs for teachers.

The literature review revealed that the most effective professional development programs were teacher-driven, long-term in nature, connected to a teachers' career-long professional development continuum, included opportunities for peer interaction (including mentorship between new and experienced teachers), and were supported by a cross section of stakeholders (Department of Education, school boards, scientists, informal science institutions, school administrators, scientists, teachers, parents and students). In addition, effective elements included an inquiry-based approach to science teaching including integration with other subjects (cross-curricular connections). An analysis of formative assessments served to reinforce findings from survey, focus group, and interview data, specifically the need to ensure applied hands-on applications and curriculum connections, to consider varying and sometimes limited levels of scientific literacy of workshop participants, to provide opportunities for peer interaction, and ensuring handouts include experiment guidelines and equipment suppliers.

Promotion and Registration

Findings from surveys, focus groups and interviews with teacher participants revealed the majority of teachers learned about upcoming workshops by email or a poster or flyer in their school mailbox and preferred these methods of communication in the future. It is important to note that school board email systems tend to classify large-scale email mail-outs as Spam. For this reason, the CSN Coordinator focuses email-based advertising efforts on former CSN participants. Regardless, a number of participants reported that they still did not learn of upcoming workshops in time. A breakdown in board and school-level communications was reported as the primary challenge related to promotion efforts. Due to busy schedules school staff may neglect to place flyers in teachers' mailboxes or science-specialists and department heads may neglect to pass along email information to relevant teachers. Future efforts should be focused on improving these critical lines of communication and ensuring other methods of communication continue (i.e. poster in staffroom, word of mouth, conferences, and relevant websites). To ensure direct communication, CSN could incorporate a quarterly email-out to all teachers working for Calgary and area school boards, charter schools and independent schools. These efforts should utilize existing board and school-based communication lists. This email-out should include a PDF copy of the annual workshop schedule and specifics related to upcoming

workshops for that quarter. This would also involve direct coordination with school boards to ensure this email-out would not be identified by SPAM software. Teacher participants also indicated that while the current registration and payment system was convenient, an online registration and payment process would be beneficial. Online registration and payment would allow a participant to immediately confirm his / her seat in the workshop and would assist with direct processing of credit card payments. An online registration process could also tie into a participant-only access area on the CSN website providing resources and supports.

Presenter Recruitment and Orientation

The majority of teacher and scientist-presenters were recruited by referral from a colleague and / or through direct contact from the CSN Coordinator. Future recruitment efforts should focus on targeted advertising through professional associations and networks (including outreach through teachers and scientists presenting or attending CSN workshops). Referrals should continue to be followed up directly by the CSN Coordinator. The majority of teacher and scientist-presenters indicated the orientation process was effective, especially one-on-one meetings with the CSN Coordinator and pairing new with experienced presenters. Future orientation efforts should focus on specific presenter needs with an emphasis on the needs of new presenters and presenters with low scores on formative assessments. It was also noted that scientists should be reminded of the sometimes limited literacy levels of participants and should seek support from the teacher-presenter and / or the CSN Coordinator to ensure science information is level appropriate and connected to the curriculum. In addition, the orientation package should include tips for success including the need for hands-on applications, curriculum connections, relevant science information directed at teachers with varying levels of scientific literacy, interactive workshop format allowing for peer interaction, resource considerations (online and digital format preferred, pre-workshop overview including basic science concepts, how-to guidelines for experiments, a list of suppliers for difficult to find supplies), and an overview of effective presentation skills.

Format and Content

Teachers and presenters agreed that the most effective and unique elements of CSN workshops were hands-on applications connected directly to the curriculum, the interactive format of workshops allowing for peer networking and use of science equipment, scientist-teacher presenter teams, useful workshop handouts, the inclusion of science background information, 1 to 2 hour symposiums and 2.5 to 3 hour workshops. A limited number of respondents preferred the 5 to 6 hour workshop format, therefore this workshop format should continue only if interest permits.

While the majority of teachers and presenters agreed that current workshop topics are relevant, it was recommended that future improvements focus on expanding offerings to include advanced and more in-depth topics and applications. Current content was reported as useful to teachers new to the subject material and those looking for new ideas. In order to engage teachers with more content experience, CSN should begin incorporating a series format to allow for exploration into advanced topics in addition to introducing more topics related to the senior division, teaching methods (inquiry-based), and cross-curricular connections.

Resources and Impact

The most effective resources identified from survey, focus group, and interview data included the workshop handout, hands-on materials and equipment used in workshops, and equipment samples for use in classrooms. With limited resources (human and financial),

presenters indicated it was difficult to provide extensive resource packages or equipment samples. Future efforts should focus on ensuring handouts include detailed 'how to instructions' and a list of suppliers for less common equipment. The CSN Coordinator should continue to support presenters in their preparation of workshop resources on an as-needed basis. Teachers also requested online availability of a pre-workshop overview, a digital version of workshop handouts and related resources (i.e. power point presentation), a concise list of web-based resources for teachers and students, a list of science experts for content-specific follow-up (currently available through CSN staff), and a forum for post-workshop discussion that would allow for sharing questions and best practices including those related to proposed experiments. CSN should seek funding to develop and maintain a participant-only area of their website incorporating the above supports. With registration, participants could receive annual access to these online resources and supports.

The majority of teacher respondents reported that they were inspired as a result of their participation in CSN workshops and had used suggested activities in their classrooms. Teachers were more likely to use handouts if they were in digital form allowing for modifications and were more likely to use suggested activities if detailed how-to instructions and a list of equipment suppliers (for hard to find items) were included. While presenters highlighted the amount of time required to prepare for a presentation and related resources, current remuneration and support was sufficient. Findings clarified that presenter motivation revolved around passion for science and a desire to impact classroom practice. In order to address this motivation, teachers should be surveyed 3 to 6 months following participation in order to specifically track impact on classroom practice and identify emerging needs. These findings should be shared with presenters in an effort to communicate the impact of their efforts. In addition, presenters should be surveyed or interviewed on an annual basis in order to ensure their perspectives guide ongoing improvement efforts.

It is important to highlight that CSN staff and the Board of Directors were identified as highly effective, knowledgeable and committed to ongoing improvements of the CSN Teachers Workshops Program. In conclusion, evaluation findings indicate the Teachers Workshop Program has a high level of effectiveness in the areas of teacher promotion and registration, presenter recruitment and orientation, format, content, resources, and impact on classroom practice. Improvement recommendations are primarily focused on expanding and fine-tuning existing professional development offerings.

RECOMMENDATIONS

Findings from this evaluation indicate the Teachers Workshop Program has a high level of effectiveness in the areas of teacher promotion and registration, presenter recruitment and orientation, format, content, resources, and impact on classroom practice. Improvement recommendations are primarily focused on expanding and fine-tuning existing professional development offerings.

Promotion and Registration

- An annual schedule for CSN workshops should be developed and disseminated widely in early August of each year allowing teachers to coordinate workshops with unit planning for the year – this annual schedule should be featured prominently on the CSN website (with revisions updated regularly)
- Future promotion activities should focus on disseminating information through direct emails to teachers and flyers in teachers mailboxes – CSN should work directly with school boards (and charter and independent schools) to ensure access to teacher emails and ensure emails are not blocked by SPAM software

- A quarterly e-newsletter / print flyer could be used as a regular communication tool featuring details of upcoming workshops and a snapshot of the annual schedule
- Future improvements to the registration and payment process should include an online option in addition to existing methods (phone, mail, fax) – online registration will allow for swift processing of payment and immediate confirmation of available space (and a online receipt could be available to print)

Presenter Recruitment and Orientation

- Future recruitment of presenters should focus on identifying and targeting relevant associations and networks (science associations, retired teachers) through advertising in publications and presentations at conferences or meetings
- Presenter recruitment should continue to encourage referrals from CSN stakeholders (presenters, participants, board of directors) – a referral box could be used at relevant conferences to encourage teachers and scientists to recognize colleagues (this contact information could then be used by the CSN coordinator for direct follow up)
- The CSN Coordinator should continue to meet one-on-one with new presenters, new presenters should be encouraged to attend a workshop prior to their presentation, and new presenters should be paired with experienced presenters when possible – ongoing orientation and training support for presenters should continue to be provided by the Coordinator based on identified need (new presenters, presenters with low formative assessment scores)
- The presenter orientation package should include an emphasis on the following tips for success: hands-on applications with direct curriculum connections, grade appropriate science information directed at teachers with varying levels of scientific literacy, interactive workshop format allowing for peer interaction, resource considerations (online and digital format preferred, pre-workshop overview including basic science concepts, how-to guidelines for experiments, a list of suppliers for difficult to find supplies), and an overview of effective presentation skills

Workshop Format and Content

- The format of workshops should continue to prioritize the following elements: hands-on applications connected directly to the curriculum, the interactive format of workshops allowing for peer interaction and use of science equipment, scientist-teacher presenter teams, workshop handouts including how-to guidelines and equipment suppliers, and the inclusion of science background information
- 1 to 2 hour symposiums and 2.5 to 3 hour workshops should continue (length based on the amount of information to be covered) - a limited number of respondents preferred the 5 to 6 hour workshop format, therefore this workshop format should continue only if interest permits
- Workshop content improvements should focus on curricular and cross-curricular connections, and ensuring varying scientific literacy levels of teachers are addressed
- In order to meet evolving professional development needs (especially for teachers with more content experience), select workshop topics should be expanded into Part I, II (and III) allowing teachers to explore advanced topics including advanced science information, additional hands-on applications, cross-curricular connections, emerging teaching methodologies (inquiry-based), and cross-grade connections
- New topics should be based on teacher needs (as identified through ongoing formative assessments and tracking surveys) – special consideration should be given

to expanding senior high topics, addressing the new curriculum, addressing the needs of the large number of new teachers entering the Calgary education system, and addressing the needs of more experienced teachers

Resources and Impact

- The CSN Coordinator should continue to work with presenters in order to support the preparation of relevant resources
- A pre-workshop overview should include science information and activities that will be covered – in addition, an overview of basic science concepts should be included in order to address the needs of teachers with limited scientific literacy levels, this overview should be available on the CSN website and a condensed overview should be featured in the quarterly e-newsletter
- Workshop handouts should specifically include how-to guidelines for activities and a list of equipment suppliers (for hard to find items) – presenters should be encouraged to use equipment that is available to teachers
- CSN should work with presenters, school boards and equipment suppliers to ensure materials are available to teachers
- Presenters should be encouraged to provide resources online in digital format to allow for easy access and ability to modify – handouts should be available after the workshop to ensure teachers attend
- CSN should seek funding to develop and maintain a participant-only area of their website incorporating online availability of a pre-workshop overview, a digital version of workshop handouts and related resources (i.e. power point presentation), a concise list of web-based resources for teachers and students, a list of science experts for content-specific follow-up, and a forum for post-workshop discussion that would allow for sharing questions and best practices including those related to proposed experiments - with registration, participants could receive annual access to these online resources and supports
- CSN could also facilitate more formal peer networking and mentorship programs following a model similar to the Alberta Women's Science Network 'SCIBerMENTOR' Program
- An online tracking survey should be administered to workshop participants 3 to 6 months following participation in order to track impact on classroom practice and to identify emerging professional development needs – tracking results should be shared with presenters in order to communicate their impact on classroom practice and identified needs should guide the selection of new and expanded topics
- An annual online survey should be administered to presenters in order to identify emerging needs and to ensure presenter perspectives guide future improvement efforts