



Request for proposals: Where is the E in STEM? A review of K-12 STEM Education in Canada

Date issued: September 21st, 2021

Proposal Submission Deadline: October 8, 2021

Questions concerning this RFP should be directed to:

Kim Bouffard
Manager, Outreach and Engagement
kim.bouffard@engineerscanada.ca
613.232.2474 x207
(the "Contact Person")

1 Table of contents

1	Table of contents	2
2	Statement of purpose	4
3	Background information	5
3.1	Engineers Canada background.....	5
3.2	Background on K-12 engineering education.....	5
4	Project Scope	6
4.1	Scope of Work.....	6
4.2	Deliverables.....	7
4.3	Project Budget.....	7
4.4	Project timelines	7
5	RFP submission and evaluation process	8
5.1	Submission schedule.....	8
5.2	Inquiries	9
5.3	Proposal submission	9
5.4	Proposal evaluation	9
5.4.1	Evaluation Process	9
5.4.2	Mandatory Requirements.....	9
5.4.3	Scoring.....	10
5.4.4	Scoring Legend	10
5.4.5	Proposal evaluation	11
5.4.4	Confidentiality.....	12
6	RFP terms and conditions	12
6.1	Process conditions	12
6.2	Competitive process	13
6.3	Proposal revisions	13
6.4	Cost of preparing proposals.....	13
6.5	Clarification of proposal.....	13
6.6	Acceptance of RFP conditions.....	14
6.7	Notification of success	14
6.8	Negotiation delay.....	14
6.9	Reservation of rights.....	14

6.10 Limitation of damage 14

6.11 Proposal Documents 15

2 Statement of purpose

Engineers Canada is seeking proposals from entities (“**Bidders**”) for the development of a research report providing guidance to key stakeholders regarding the creation and implementation of K–12 engineering curricula and instructional practices, focusing on the connections among science, technology, engineering, and mathematics (“**STEM**”) education (the “**Project**”). This is a component of our operational imperative to “Foster recognition of the value and contribution of the profession to society and sparking interest in the next generation of engineering professionals” (the “**Program**”).

Successful completion of the Project will entail that the Bidder:

1. Conduct a literature review of the current research related to the impact of engineering-related K-12 initiatives, to the extent such information is available. The literature review will provide knowledge of existing research and identify gaps so additional research can be encouraged.
2. Survey the landscape of current and past efforts to implement engineering-related K–12 instructional materials and curricula in Canada and describe the ways in which STEM education has incorporated engineering concepts or used engineering as a context to explore STEM.
3. Using enrollment data from the Ministry of Education from each province and territory, provide a benchmark on the number of and demographics of students graduating from high school with the necessary grades and prerequisites to pursue an undergraduate degree in engineering.

The objective of the Project is to shed light on two guiding questions:

QUESTION 1: How might K-12 engineering education complement the learning objectives of other content areas, particularly science, technology, and mathematics, and how might these other content areas complement learning objectives in engineering education?

QUESTION 2: What educational policies, programs, and practices at the local, provincial, and federal levels might permit meaningful inclusion of engineering related K–12 curriculum in Canada?

3 Background information

3.1 Engineers Canada background

Engineers Canada upholds the honour, integrity, and interests of the engineering profession by supporting consistent high standards in the regulation of engineering, encouraging the growth of the profession in Canada, and inspiring public confidence. For over 80 years, we have worked on behalf of the provincial and territorial engineering regulators that regulate engineering practice and license the country's more than 300,000 members of the engineering profession.

Our work is focussed on ten (10) core purposes, as established by Engineers Canada's members, the engineering regulators:

1. Accrediting undergraduate engineering programs.
2. Facilitating and fostering working relationships between and among the regulators.
3. Providing services and tools that enable the assessment of engineering qualifications, foster excellence in engineering practice and regulation, and facilitate mobility of practitioners within Canada.
4. Offering national programs.
5. Advocating to the federal government.
6. Actively monitoring, researching, and advising on changes and advances that impact the Canadian regulatory environment and the engineering profession.
7. Managing risks and opportunities associated with mobility of work and practitioners internationally.
8. Fostering recognition of the value and contribution of the profession to society and sparking interest in the next generation of professionals.
9. Promoting diversity and inclusivity in the profession that reflects Canadian society.
10. Protecting any word(s), mark, design, slogan, or logo, or any literary, or other work, as the case may be, pertaining to the engineering profession or to its objects.

3.2 Background on K-12 engineering education

In recent years, the importance of STEM learning in primary and secondary education has received increased attention from the private, public, and non-profit sectors. The focus on STEM topics is closely related to concerns about Canada's competitiveness in the global economy and about the development of a workforce with the knowledge and skills to address technical and technological issues.

To date, most efforts to improve STEM education in Canada have been concentrated on mathematics and science; however, increasingly provinces and school districts across the country are adding technology education and design thinking principles to the mix.

Although there is no shortage of analyses of existing systems' shortcomings or recommendations for improvements to STEM education, educators, researchers, and policy makers lack a clear picture of the extent to which K-12 classrooms across Canada are implementing design thinking and engineering in STEM education or the impact of engineering-related K-12 initiatives.

The presence of engineering curricula in K–12 classrooms is important, particularly for the engineering profession given that, despite a steady increase in the representation of women at all levels in STEM, women continue to be underrepresented throughout the engineering profession. A recent report by the University of Guelph's College of Engineering and Physical Sciences identified that high school is the critical point where the largest number of potential female engineers are lost in Ontario and concluded that this loss has nothing to do with achievement gaps between the sexes. To our knowledge, this report has not been replicated across the country leaving the question as to whether high schools across Canada have witnessed the same experience, or if the report's findings are isolated to high schools in Ontario.

4 Project Scope

4.1 Scope of Work

Working closely with Engineers Canada (including the Manager, Outreach and Engagement as the primary point of contact), the successful Bidder will deliver a research report of no more than 25 pages (including all appendices and references) with a detailed description of work performed, findings, and conclusions. The final research report should include:

- A literature review of approximately 2,500 words (or 4 to 5 pages) that summarizes existing research and its relevance and applicability to professional regulation of engineering. Include a comprehensive list of all research and literature evaluated.
- A summary of efforts at the provincial and territorial level to implement engineering-related K-12 instructional materials and curricula.
- A description of the ways in which STEM education has incorporated engineering concepts or used engineering as a context to explore STEM.
- A summary of the top influencers within the NGO sector that are supporting and/or contributing to engineering-related K-12 instructional materials and curricula.
- A summary and analysis of enrollment data from the Ministry of Education from each province and territory on the number of and demographics of students graduating from

high school with the necessary grades and prerequisites to pursue an undergraduate degree in engineering.

Considerations

- The audience for the report is STEM educators, policy makers, and parents from across the country. Basic or foundational knowledge of STEM education should be assumed.
- Engineers Canada will provide information on the necessary prerequisites for admission into engineering post-secondary programs.

4.2 Deliverables

The successful Bidder shall competently deliver to Engineers Canada a final research report, taking into consideration each of the items outlined in section 4.1 (Scope of Work), resulting in successful completion of the Project. All deliverables are subject to acceptance and approval by Engineers Canada.

4.3 Project Budget

Engineers Canada has a budget of \$20,000 for this Project. To be considered, proposals should cite a total Project cost within this range.

4.4 Project timelines

All proposals must include a timeline reflecting how each of the items outlined in section 4.1 (Scope of Work) will be completed by the proposed deadlines, noted below.

No.	Deliverable Description	Key Dates*
1	Research plan and outline for review and feedback	November 9, 2021
2	Summary of the top influencers within the NGO sector that are supporting and/or contributing to engineering-related K-12 instructional materials and curricula	December 9, 2021
3	Summary of efforts at the provincial and territorial level to implement engineering-related K-12 instructional materials and curricula. Including description of the ways in which STEM education has incorporated engineering concepts or used engineering as a context to explore STEM.	December 14, 2021

4	A comprehensive list of all research and literature evaluated for literature review	January 25, 2022
5	A literature review of approximately 2,500 words (or 4 to 5 pages) that summarizes existing research and its relevance and applicability to professional regulation of engineering. Include a comprehensive list of all research and literature evaluated.	February 22, 2022
6	Summary and analysis of enrollment data from the Ministry of Education from each province and territory	March 11, 2022
7	Draft report submitted for review (with feedback from Engineers Canada to be given on or about March 23, 2022)	March 18, 2022
8	Final report	March 31, 2022

* These dates are subject to change in Engineers Canada's sole discretion.

In addition to the above, a **kick-off meeting** between the successful Bidder and Engineers Canada is requested to be scheduled on or about **October 29, 2021**, and **two (2) feedback and progress report meetings** are proposed for **December 21, 2021** and **March 4, 2022**.

5 RFP submission and evaluation process

5.1 Submission schedule

The following is a list of key dates from Request for Proposal (RFP) issuance through to Notice of Award. The dates are subject to change by Engineers Canada, at its sole discretion.

No.	Description	Key Dates
1	Issue RFP	September 21, 2021
2	Proposal Submission Deadline	16:00 ET on October 8, 2021
3	Evaluation of proposals	October 11-15, 2021
4	Interviews with top Bidders and reference checks	October 18-22, 2021
5	Notice of Award issued (subject to negotiation of Service Agreement)	October 27, 2021

5.2 Inquiries

Bidders may submit questions concerning the RFP or the Project to the Contact Person, Kim Bouffard, Manager, Outreach and Engagement by email at kim.bouffard@engineerscanada.ca. Responses to questions that are relevant to all Bidders will be collated and made available to all invited Bidders, without attribution.

5.3 Proposal submission

Proposals must be submitted electronically, via email, no later than **October 8, 2021, at 4pm ET** (the “Proposal Submission Deadline”) to Kim Bouffard, Manager, Outreach and Engagement at kim.bouffard@engineerscanada.ca.

5.4 Proposal evaluation

5.4.1 Evaluation Process

Upon the closing of the Proposal Submission Deadline, Engineers Canada will evaluate proposals in accordance with the following process:

Stage 1: Initial Assessment

All proposals received by Engineers Canada will initially be assessed by the Manager, Outreach and Engagement (or their delegates) and any other individuals(s) that are deemed necessary.

The assessment of each proposal will be based on the contents of the Bidders’ written proposal and any statements provided in writing, if needed, in response to requests for clarification made by Engineers Canada. Engineers Canada will ensure compliance with the stated mandatory requirements and will score each proposal, in accordance with section 5.4.4 (Scoring Legend).

Stage 2: Interviews and Reference Checks

Following Engineers Canada’s initial assessment of the proposals, the 1-2 highest scoring Bidders will be contacted to conduct interviews and further confirm their ability and fit to provide the required services and deliverables. The references of the top-scoring Bidders may also be contacted at this stage.

Once this assessment is complete, Engineers Canada will proceed to select and notify the successful Bidder, by issuing a Notice of Award.

5.4.2 Mandatory Requirements

Engineers Canada has several requirements that are deemed mandatory when submitting a response to this RFP. The following criteria have been identified as mandatory:

- Interest disclosure must be received before the Interest Disclosure Deadline.
- Proposals must be received prior to the Proposal Submission Deadline.

- Proposals must indicate that the Bidder is able to deliver the services and complete the Project within the stated timelines (per section 4.4, Project Timelines).
- Proposals must include the information requested in section 5.4.5 (Proposal Evaluation).
- Proposals must clearly state a total Project cost within the range cited in section 4.3 (Project Budget), including all fees and expenses, in Canadian funds.

Proposals that, in the sole discretion of Engineers Canada, fail to meet any mandatory requirement will be eliminated from further consideration in the evaluation process. However, Engineers Canada reserves the right to waive any mandatory requirements it deems fit and appropriate to meet the interests of and provide best value to Engineers Canada. This clause should be interpreted solely for the benefit of Engineers Canada and not for the benefit of the Bidders.

5.4.3 Scoring

Proposals will be evaluated and scored by Engineers Canada, using predetermined criteria to determine which proposal potentially provides the best value. Scoring of proposals and evaluation comments are confidential and will not be disclosed.

In terms of relative importance, each criterion is given a pre-assigned weight, as outlined in section 5.4.5 (Proposal Evaluation), by which each proposal will be evaluated. Each criterion is rated on a scale of 0 to 10 (see section 5.4.4, Scoring Legend, below). Each criterion's rating is then multiplied by the assigned weight to yield a total for that element. Summation of the individual totals yields a total score, which represents the overall degree of satisfaction for the respective submission.

5.4.4. Scoring Legend

0 Points Deficient	1-3 Points Poor	4-6 Points Fair	7-8 Points Good	9-10 Points Excellent
The proposal fails to meet the requirements of the applicable scoring criteria in a suitable and documented manner.	The proposal fails to meet the requirements of the applicable scoring criteria in a suitable and documented manner.	The proposal barely meets the requirements of the applicable scoring criteria in a suitable and documented manner.	The proposal reasonably demonstrates that the requirements of the applicable scoring criteria are met in a documented and suitable manner.	The proposal fully demonstrates that the requirements of the applicable scoring criteria are met in a documented and suitable manner.
The proposal fails to demonstrate that the Project will be performed in an	The proposal reveals significant weaknesses that	The proposal reveals weaknesses that	The proposal reveals minor weaknesses that	There are no apparent weaknesses.

acceptable manner.	could result in unacceptable shortcomings in performance of the Project.	could result in tolerable or reasonably correctable shortcomings in performance of the Project.	should not significantly impact performance of the Project.	
--------------------	--	---	---	--

5.4.5. Proposal evaluation

The Bidder proposals will be evaluated as follows:

No.	Scoring Criteria	Weight	Points	Total Points
1	Mandatory requirements	Elimination		
2	Qualifications and relevant experience (with examples)	50		
3	Approach and methodology	30		
4	Fees and expenses	15		
5	Quality of submission	5		
Total		100		

To confirm the above criteria, Bidders must include with their proposal, at a minimum, the following supporting information:

A. Mandatory requirements

- See section 5.4.2 (Mandatory Requirements)

B. Qualifications and relevant experience:

- Bidders must detail their experience with:
 - Qualitative research and analysis
 - Knowledge of STEM and education in Canada
 - Writing research reports and literature reviews

C. Approach and methodology:

- Bidders are asked to describe how they will approach the research

- Bidders should describe their understanding of the Project requirements and deliverables.
- Bidders should identify the expected challenges for this Project and the proposed mitigation strategies.
- Bidders shall provide a detailed work plan, with timelines that respect those set out in section 4.4 (Project Timelines).

D. Fees and expenses:

- Bidders shall outline their proposed costs and fees.

In addition to the above, Bidders must supply the name, email address, and phone number of two (2) recent clients (within the past 24 months) who have received services similar to those requested in this RFP and who may be contacted as references. Bidders are asked to provide a short description of the work performed, including how it was similar to this Project.

Engineers Canada will communicate with the winning Bidder throughout this Project in English. All proposals must therefore be submitted in English.

5.4.4 Confidentiality

Proposals and information submitted by Bidders will be treated as proprietary, held confidential, and used only for evaluating the ability of the Bidder to handle the Project. The details of any proposals will be shared only with the persons involved in the Project evaluation and any others, as may be deemed necessary from time to time (for example, to our legal advisors for the purpose of conducting contract negotiations with the successful Bidder).

6 RFP terms and conditions

6.1 Process conditions

This RFP is not an offer by Engineers Canada to any person, and no contract of any kind whatsoever (including, without limitation, no “Contract A”) is formed between Engineers Canada and any Bidder upon the submission of a proposal in response to it. For greater certainty, nothing in this RFP, including without limitation, the use of mandatory language, language reserving rights to Engineers Canada, or other language that might, but for this clause, be indicative of contractual intention, is intended by Engineers Canada to indicate an intention to be contractually bound to any Bidder in any manner whatsoever. Engineers Canada retains the right, in its absolute discretion, to consider and analyze the proposals, negotiate with any Bidder at any time, select a preferred Bidder, or enter a service contract with a Bidder. Without limiting the foregoing, since this clause precludes Contract A, none of the usual Contract A terms apply, and Engineers Canada may:

- Reject or accept any proposal, whether or not complete, and whether or not it contains

all the required information;

- Require clarification of any proposal;
- Request additional information on any proposal;
- Reject any or all proposals without any obligation, or any compensation or reimbursement to the Bidders;
- Refuse to enter into a service contract with any of the Bidders;
- Re-advertise for new submissions, or call for tenders for this work or for work of a similar nature.

Engineers Canada may, in its sole discretion, independently verify any information in any proposal. The proposals submitted by Bidders must be offers made in good faith, and Engineers Canada reserves the right to make a choice from the various proposals, or not choose any. Engineers Canada shall not be obligated in any manner until a written agreement relating to an approved proposal has been duly executed.

6.2 Competitive process

With the issuance of this RFP, Engineers Canada is making a business opportunity available to Bidders having the experience, competence, and managerial sophistication to enter into a service contract to complete the work. Engineers Canada is committed to improving supplier diversity and encourages Bidders that are owned, managed, and controlled by persons from underrepresented groups, including Indigenous, Black, people of colour, person with disabilities (including invisible and episodic disabilities), and members of the LGBTQ2S+ community to submit a proposal.

6.3 Proposal revisions

All proposal revisions must be received by Engineers Canada prior to the Proposal Submission Deadline stated in section 5.3 (Proposal Submission), above.

6.4 Cost of preparing proposals

Bidders are solely responsible for all costs they incur in preparing and submitting proposals.

6.5 Clarification of proposal

Engineers Canada reserves the right, but does not have an obligation, to request clarification of a proposal or request further information from any or all Bidders. In addition, if, in the opinion of Engineers Canada, any proposal contains a minor defect or irregularity or fails in some way to comply with any requirement of the RFP in a way that, in the opinion of Engineers Canada can be remedied without providing an unfair advantage to one or more Bidders, the Engineers Canada contact person (identified in section 5.2) or their delegate may request rectification from the Bidder(s).

Engineers Canada, upon receipt of appropriate clarification and/or rectification, may waive the minor defect or irregularity and accept the proposal. Failure by a Bidder to provide a written

response that, in the opinion of Engineers Canada, properly clarifies or rectifies its proposal, within the time specified in the request for clarification or rectification, may result in disqualification of the proposal.

6.6 Acceptance of RFP conditions

Receipt of a proposal by Engineers Canada will be considered acceptance by the Bidder of the RFP terms and conditions and will be incorporated in the Bidder's proposal.

6.7 Notification of success

A written Notice of Award shall be the only valid form of notification of success in response to this RFP.

6.8 Negotiation delay

Engineers Canada will draft and provide the successful Bidder with a written agreement governing the provision of services and deliverables under the Project. If a written agreement cannot be concluded within fifteen (15) business days of notification to the successful Bidder, Engineers Canada may, in its sole discretion, terminate negotiations with that Bidder and either negotiate a service agreement with another Bidder of its choice or choose to terminate the RFP process and not enter into a contract with any of the Bidders.

6.9 Reservation of rights

Engineers Canada reserves the right, in its sole discretion, to:

- modify, amend, delay, cancel or suspend the selection process, or any or all stages of the selection process, including before or after provision of a Notice of Award, at any time for any reason;
- accept or reject any proposal based on the evaluation criteria in section 5, above, as determined in the sole discretion of Engineers Canada;
- not accept any proposal; and
- reject or disqualify all or any proposal without any obligation, compensation, or reimbursement to any Bidder.

6.10 Limitation of damage

Each Bidder, by submitting a proposal, agrees that:

- In the event any or all proposals are rejected or disqualified, or the Project or selection process is modified, delayed, suspended or cancelled for any reason, neither Engineers Canada, nor its employees, agents, officers, or directors will be liable under any circumstances for any claim, or to reimburse or compensate any person in any manner whatsoever, including but not limited to costs of preparation of the proposal, loss of anticipated profits, loss of opportunity, or for any other matter; and

- The Bidder waives any claim for loss of profits or loss of opportunity if : (i) the Bidder is rejected or disqualified or is not successful in the selection process; (ii) the selection process for the Project is delayed, suspended, cancelled or modified at any time; or (iii) cancellation occurs per the above.

6.11 Proposal Documents

All documents submitted by Bidders will become the property of Engineers Canada.