ENHANCING CO-OP AND CAREER DEVELOPMENT ACTIVITIES THROUGH A STUDENT-DRIVEN MENTORSHIP PROGRAM

Allan MacKenzie and Fei Geng
McMaster University, W. Booth School of Engineering Practice & Technology
mackenza@mcmaster.ca; gengf@mcmaster.ca

Abstract – McMaster's University Bachelor of Technology (B.Tech.) Program has a mandatory 12-month cooperative (co-op) work experience as part of its academic requirements for graduation. To assist students in attaining co-op opportunities they must enroll in a career development credit course to equip them with vital knowledge and tools necessary to obtain and retain co-op work experiences. Students also receive ongoing support and guidance from Engineering Co-op & Career Services (ECCS) department, which connects students with employers and provides individual career counselling services. Despite this training and the availability of services, many students struggle to obtain workplace co-ops. In response the School of Engineering Practice and Technology (SEPT) implemented an undergraduate career peer co-op mentoring program as a further support mechanism to engage and motivate students. A pilot mentorship program was launched in 2014-15 for a select group of students and based on the positive response; an ongoing program was adopted and has run for the last two years. The program is formal in nature with a senior student mentor randomly matched with approximately 10-12 junior students as their mentees. To date, the program has impacted 362 second-year students (the mentees) and 36 senior students (the mentors). For the purposes of knowledge sharing, the paper will discuss the benefits of peer mentoring research, the SEPT undergraduate peer career mentoring program design and structure, and lessons learned from the outcomes of the last three years.

B.Tech. is a skills-based engineering technology and management program at the university level. The program is a partnership between McMaster University Faculty of Engineering and Mohawk College’s School of Engineering Technology. The program combines traditional lectures with hands-on practice in high-tech modern labs, along with real-world industry experience obtained through 12-months of workplace co-op in one of three areas of program specialization: Automotive and Vehicle Technology (AVT), Biotechnology (BIO), and Process Automation Technology (PAT). The B.Tech. program also uniquely blends engineering technology with management and societal courses to explore the human side of engineering. The outcome is T-shaped graduates equally savvy in technical as well as management skills, and who have breadth of perspective to tackle broad-based engineering issues in creative and practical ways.

In the B.Tech. program all the students must complete a minimum of 12-months paid co-op work experience in their industry specialization as part of the academic requirement for graduation. Experiential workplace learning brings about a number of benefits. These include, increased disciplined thinking, taking personal responsibility for learning, improved problem-solving skills, overall improved performance in the classroom, increased commitment to educational goals, and increased ability to finance education [1]. Overall, this unique program feature helps students build transferrable and technical skills essential for future career success.

To support the mandatory cooperative (co-op) education outcomes students are required to complete a Professional Workplace Practices (GENTECH 2PW3) credit course in order to be eligible for their workplace co-op experience. The course is strategically positioned in the fall term of second year before students endeavour to secure their first workplace co-op during the summer at the end of second year. Career development courses for academic credit are well established in many leading American universities in response to student lack of awareness around career development issues [2]. The purpose of GENTECH 2PW3 is to have a rigorous mandatory course aimed at enriching the career development experience for B.Tech. students and to
support their integrated management education. The clear short-term objective is to provide students with the necessary knowledge and skills to successfully fulfill their mandatory cooperative educational program requirement. Kolb’s experiential learning cycle [3] is incorporated into discussion exercises, weekly workshops, assignments, and the final exam.

Students also have ongoing support and guidance from McMaster Engineering Co-op & Career Services (ECCS), which connects students with employers and provides individual career counselling services. Experienced career advisors are available to help students with cover letter and resume critiques, one-on-one interview coaching and industry specific job search strategies.

Despite receiving structured career development training and the availability of career services, many students struggle to obtain their first four-month workplace co-op during the summer after completion of second year. Tracking data from the ECCS office indicates over the last three years, approximately 60% of the students in these cohorts do not secure a four-month co-op position after second year. Those left behind have a co-op deficit which they must make-up in the future to fulfill the requirements for graduation. Therefore the B.Tech. faculty and administration implemented a career co-op peer mentoring program as a further support mechanism to engage and motivate students with information sharing and career strategizing. Research shows that peer mentoring is an effective means of supporting the career-related and psychosocial needs of students in higher education [4]. Some researchers suggest that informal mentoring relationships are more successful than formal ones; however, both types have shown that the mentor and mentee can benefit [5].

Peer mentoring, in which qualified senior students provide guidance and support to vulnerable students to enable them to navigate through their education is regarded as an effective intervention to ensure these outcomes [6,7,8,9,10,11]. The traditional form of mentoring consists of a hierarchical relationship in which the mentor is considerably older and more experienced than the mentee [4]. However, Kram and Isabella [12] have described peer mentoring as a valuable alternative to the traditional concept of mentorship. Unlike traditional mentoring, peer mentoring matches’ mentors and mentees who are roughly equal in age, experience, and power to provide task and psychosocial support [13].

Several reviews of mentoring and peer-mentoring programs in higher education found large variations in the definitions, goals, parameters, training, and organization of such programs [14,15,16]. Kram and Isabella [12] differentiated mentoring programs on the type of support that they provided, those that had a task or career related function (providing advice, support, and information related to task accomplishment) and those that had a psychosocial function (providing emotional and psychological support). Jacobi [16] agreed that mentoring relationships are helping, reciprocal, and personal relationships that include any or all of the following: (a) emotional and psychological support; (b) direct assistance with career, academic, and professional development; and (c) role modeling. More recently, Nora and Crisp [17] cited evidence that effective mentoring programs could provide: (a) psychological and emotional support, (b) degree and career support, (c) academic subject knowledge support, and (d) role modeling.

2. MENTORSHIP PROGRAM DESIGN

In 2014-15 a pilot career peer co-op mentorship program was launched only for the Biotechnology (BIO) stream. Based on the positive response, an ongoing co-op mentorship steering committee was formed to manage the process for all three B.Tech. program streams over the last two cohort years. This initiative targets second-and fourth-year students uniquely. While second year students learned about their peers’ first-hand co-op experiences and receive career advice, senior students honed their professional skills through this leadership experience. To date, as shown in Table 1, the program has impacted 362 second-year students (the mentees) and 36 senior students (the mentors).

Table 1: Peer Co-op Mentorship Program Data

<table>
<thead>
<tr>
<th>Academic Year</th>
<th>Mentees</th>
<th>Mentors</th>
<th>Ratio (rounded)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014-15</td>
<td>35</td>
<td>9</td>
<td>4:1</td>
</tr>
<tr>
<td>2015-16</td>
<td>161</td>
<td>15</td>
<td>11:1</td>
</tr>
<tr>
<td>2016-17</td>
<td>166</td>
<td>12</td>
<td>14:1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>362</td>
<td>36</td>
<td>10:1</td>
</tr>
</tbody>
</table>

The program is formal in nature with a senior student mentor randomly matched with approximately 11-14 junior students as their mentees. The formal mentorship approach is supported in the research when the primary purpose of the mentors is to provide advice, coaching, and some career planning assistance [18]. Mentees are introduced to their mentors nearing the completion of their mandatory career development course; this timing coincides with the start of the second-year students (the mentees) search for their first summer co-op positions.

2.1 Mentor Recruitment and Selection

The co-op mentorship steering committee, which has a faculty representative from each of the program streams, manages the recruitment and hiring process. An email is sent to all the potential mentor candidates, approximately 300+ third and fourth year students to advertise the Peer
The Co-op Mentorship Program in early October. This gives approximately one month to complete the selection and on-boarding process. Preferred mentor qualifications include: strong interpersonal communication skills, comprehensive knowledge of the co-op process and successful job search strategies, solid academic performance and previous successful co-op workplace experience with more than one employer. The process includes each student applicant being screened and selected based on the qualifications required for the position. However, what has transpired over the last three years, is no senior student who has applied to be mentor has been rejected.

During the past three academic years the distribution of mentors as represented by each program stream has been unequal. Figure 1 graphically depicts the mentors by program stream.

The 2014-15 academic year was the peer co-op mentorship pilot which focused only on students from the BIO program stream, including the nine mentors. The last two years has seen strong representation of mentors from both the BIO and PAT program streams. Unfortunately, the AVT program stream has had the lowest mentor representation, despite accounting for 38% of the entire B.Tech student population.

Gender representation of peer mentors throughout the three academic years, as shown in Fig. 2 has been fairly balanced. This is surprising considering female students only account for approximately 17% of the enrollment across all three cohort years. The highest female mentor representation comes from the BIO program stream at 37%, followed by PAT at 12% and AVT at 3%.

The number of mentors, along with the program and gender distribution seems to be mostly related to the student candidate selection pool constraints, rather than by any deliberate design of the co-op mentorship steering committee members.

The mentors are required to sign and abide by a Peer Co-Op Mentorship Program Agreement, which outlines the purpose of the program, specific milestones and time commitment, along with expectations about types of communication activities to connect with mentees. All mentors receive a $500 honorarium paid in two equal installments (December and April) based on confirmation the work is completed in accordance with the Peer Co-Op Mentorship Program Agreement. There is a one week opt-out period which allows for a co-op mentor to withdraw from this commitment if they choose.

There is mandatory training which matches new peer mentors with a senior peer mentor who has previously participated in the peer co-op mentorship program. This allows the new mentors to become acquainted with the program expectations and procedures. To help ensure all the mentors fulfill their role effectively and consistently, the co-op mentorship steering committee faculty members act as supervisors. They organize and meet biweekly with mentors from their particular program stream to discuss issues the mentors may be experiencing and how to best resolve them.

The number of mentors, along with the program and gender distribution seems to be mostly related to the student candidate selection pool constraints, rather than by any deliberate design of the co-op mentorship steering committee members.

On completion of training the mentors are officially announced to the second year students (mentees) who learn which mentor they have been randomly matched with during the Professional Workplace Practices course. A specific peer co-op mentorship communication platform was created on the university learning management system (LMS), which provided a mechanism for the mentors and mentees to remain connected with each other throughout the rest of the academic year. Other popular social media platforms (Facebook and LinkedIn)
are also used to further engagement. These invitation only
groups provided alternative channels for the mentors to
reach out to their mentees and post event updates, shared
important job opportunities and conducted the online live
chats.

The co-op mentorship steering committee and mentors
organized a number of touchpoint type events to further
enhance opportunities for engagement. Throughout the
term, three time a week, 2-hour ‘Coffee House Events’
were held for mentees to drop-in for informal chats to
receive feedback and advice from mentors on job search
and completing co-op job applications. There were also
virtual ‘Let’s Chat Co-op’ events held daily for two hours
on weekdays. During this particular event, at least two co-
op mentors were available online to provide suggestions
for mentees on job search challenges and directing them
to other supporting resources to assist them, such as
ECCS.

3. MENTEE FEEDBACK

At the end of the academic terms in 2015-16 and
2016-17 mentees were asked to participate in confidential
post-mentorship survey questionnaire. The participation
rates for the surveys were 12.4% and 21.7% respectfully.
The purpose was to gain further understanding of the
effectiveness of the peer co-op mentorship program
from mentees and to assess whether SEPT should continue to
offer this experiential peer-to-peer career development
intervention. The surveys were completed online using
the LimeSurvey as required by McMaster’s Research
Ethics Board. Mentees’s self-selected their involvement by
giving consent to participate in the research and were able
to opt-out at any time. For the purposes of this paper the
survey results chosen for discussion are focused on the
qualitative results obtained from open-ended questions
about what the mentees like about the program and what
suggestions they had to improve the peer co-op
mentorship program.

Many of the mentees liked that the fact program gave
them another person to talk to regarding the co-op job
search and indicated it was nice having someone to talk
with who went through the same thing they did and had
suggestions to help them. They pointed out the mentors
were much more approachable than professors or the
ECCS career advisors. They liked how they could ask
questions without feeling “dumb” about asking them.
Some mentees mentioned the moral support they
received, especially before they embarked on co-op
employer interviews. Overall, the mentees indicated peer
mentors were approachable, helpful, provided valuable
insights on career materials and responded to inquiries
and questions in a timely fashion.

When prompted, mentees suggested the following
improvements. A number of mentees suggested the
mentors needed to be introduced to them earlier in the
term and have the mentors come to their classes and
personally introduce themselves. Others indicated it
would be nice to have a seminar or presentation to fully
explain everything the mentors can do to help them in
regard to their co-op search. The issue was raised about
the need to hire more mentors so they could be assigned
fewer mentees in order to be able to provide more help or
ensure they were from the same program stream. Mentees
indicated seeming opposite perspectives about their
mentors: (1) that the mentors didn’t know much more
than themselves; or (2) that they should replace the
ECCS.

Overall, the mentees understood the purpose of the
mentorship program and felt a number of their peers were
not making use of the program, despite the value the
mentors provided. Numerous comments suggested the
mentors tried very hard to get people (mentees) involved
in the program, even giving up their personal class time to
come to their classes or were left waiting in rooms during
events in which no mentees attended, such as the drop-in
coffee houses.

4. MENTOR FEEDBACK

At the end of the 2015-16 academic term, just over
half of the mentors voluntarily participated in confidential
one-on-one interviews to share their expectations,
experiences, challenges and to provide recommendations
for improvements of the mentoring program. The 45-60
minute interviews were conducted either face-to-face, by
phone or over Skype and were sanctioned by McMaster’s
Research Ethics Board, with consent required by the
senior students (mentors) to participate in the interviews.
To further ensure anonymity, the interviews were conduct
by Ph.D. research candidate from McMaster’s DeGroote
School of Business and only the aggregated comments
from the questions were shared with the faculty involved
with the B.Tech. peer co-op mentoring program.

4.1 Why Become a Peer Mentor

When the senior students were asked why they wish to
become peer mentors; many indicated they just wanted to
give back to the B.Tech. Program and felt that it fostered
a deeper sense of belonging in the program. They also
were driven by the need to help junior students and
mentioned they did not want the mentees to make the
same mistakes they did when they were in their position
trying to find their first co-op work experience. In fact, all
the senior students interviewed wished they could have
had a peer mentor when they were going through their co-
op search during the second year of the program.

The mentor’s personal motivation and decision to be
involved in the peer mentoring program were focused on
a sense of giving back, an opportunity to work on their
personal leadership skills, to become a greater part of the
B.Tech. community and for some, it was another achievement they could list on their resume to support their personal career search opportunities after graduation. The small honorarium payment of $500 did not seem to be a major motivator to become a mentor. In fact, one mentor indicated they considered mentoring to be an extra-curricular activity.

4.2 Mentorship Program Design Feedback

In the interviews, the mentors were asked to comment on the specific aspects of the mentorship program structure, such as recruitment, training, and process of the matching mentors with mentees.

4.1.1. Recruitment and Selection. The majority of mentors specifically mentioned that they were approached individually about participating in the mentorship program and seemed pleased to be recruited in this manner. Most indicated that they were comfortable with the interview process as they already knew the professors who were on the co-op mentorship steering committee. They indicated the expectations of the position were clearly communicated during the interview process, such as working one-on-one with mentees and have regular meetings and activities e.g. reviewing cover letters and resumes, performing mock interviews, and answering questions about workplace co-op in general.

4.1.2. Training. Most mentors indicated that they had little to no training – “barebones” as suggested by a few. Some said they were given the opportunity to shadow existing mentors, but this tended to be more of a discussion about the questions asked and how to answer them. All mentors interviewed indicated this seemed like an area that could be improved in the future and to set up formal training initiatives which would outline the appropriate expectations for the mentors of their role and responsibilities as well as what to expect from the mentees.

4.1.3. Mentor-Mentee Matching Process. Most mentors suggested that after the matching stage they found that most mentees did not respond and indicated a desire for some type of formal process to encourage (or demand) mentee participate, such as a course grade or academic review process. Mentors suggested that both they and their mentees were busy and it was difficult to coordinate schedules, especially with the mentees from different program streams.

Some mentors indicated that the mismatch in programs caused distrust to the point of mentees believing the mentor would not be able to help the mentee. This was mostly related to not knowing about their particular program and industry, but the mentors said they still had a lot of beneficial information to share about the co-op process. Most mentors mentioned that they would have accepted more mentees if they were from their specific program stream. One specifically said they wouldn’t care if they had 6 or 13 mentees as long as they were all in their stream (and would respond).

Many mentors indicated that they wished they could have a stronger relationship with their mentees and were only close with one or two mentees. An interesting point from one mentor was they felt they were like a stranger to the mentees and that mentees may be more likely to go visit a mentor if they could go with friends.

4.1.4. Structure and Organization. Mentors liked the bi-weekly meetings where they could talk with other mentors about issues and challenges. Many indicated that they liked the coffee houses and discussion board and suggested that these things should be implemented earlier in the year to encourage participation by the mentees. Overall the mentors continually mentioned increasing mentee engagement and awareness, but they didn’t know how specifically to do this without making the program mandatory.

5. DISCUSSION

With any new experiential initiative, it has challenges in terms of design and implementation. A number of gaps and improvement areas have been identified by the co-op mentorship steering committee based on the feedback received from the mentees and mentors.

5.1 Mentor Recruitment Challenges

Although the co-op mentorship steering committee members conducted interviews with all mentor candidates who applied, none were vetted as there were a limited number of candidates, compared to the number of mentees to be assisted. This led to the discrepancies of knowledge, communication skills and diligence across peer mentor group. This resulted in a wide variance of performance between the mentors, which negatively impacted the quality and effectiveness of the overall mentorship program. This limited mentor applicant pool creates an adverse selection challenge which is clearly evident in the low mentor representation from the AVT program. This imbalance limits knowledge sharing and stifles AVT mentees participation in the program. As well, it is likely to become a barrier that discourages current mentees from applying to become peer mentor in their senior years. The mentorship program clearly needs to improve the recruitment methods and value proposition so more senior students apply to be become mentors.
5.2 Mentor Training Challenges

As most mentors indicated, minimal training was provided other than the opportunity to shadow the senior mentors. The shadow method provided only limited skills and approaches for maneuvering within the mentoring relationship. As a result, many of the first-time mentors relied on their own knowledge, experience and judgment when performing their mentorship outreach activities. This not only generated a large discrepancy in the performance outcomes between the mentors, but also further reduced the engagement of the mentees in the program.

To help improve and formalize the training, the co-op mentorship steering committee has begun developing a comprehensive mentor e-guide that will clearly outline standard operating procedures (SOPs) in order to structure the mentoring relationship protocols.

5.3 Mentor-Mentee Matching Challenges

When the full mentorship program was launched in 2015-16 to include all three program streams the mentors were randomly matched to mentees regardless of the stream origin for either the mentor or mentee. This randomized system was used to minimize the amount of matching bias either by program stream or gender between mentor and mentees. Moreover, this approach reduced the issue of the mentor shortage within the AVT stream. However, many mentees stated they preferred a mentor from the same technical stream to be matched with them. Some suggested their reluctance to engage fully in the mentorship program was due to the fact their assigned mentor had no professional understanding of their industry.

Steps were taken to resolve this challenge in 2016-17 by matching mentors with mentees in the same technical stream and then randomly assigning the specific mentor-mentee pairings. Unfortunately, this was not possible in all cases for the mentees in the AVT stream due to the low mentor representation. In this case, PAT mentors were assigned to AVT mentees due to the similarities between the technical streams and the respective industries.

5.4 Mentee Engagement Challenges

As identified above mentee engagement was one of the greatest challenges. This challenge was reflected in the low email reply rate from mentees to their mentors and the low participation rate of mentorship events (e.g. coffee houses). Insufficient advertisement, the ineffective communication between mentor and mentees, and lack of following-up were all potential causes of low mentorship program engagement.

To fix these issues, the co-op steering committee has created mentor profile brochures that describe the stream, expertise and past co-op experience of each mentor. Further, the committee will make better use of social media (Facebook and LinkedIn groups) early in the process and throughout the term to enhance the engagement of mentees.

6. CONCLUSION

To summarize, the B.Tech. program at McMaster University has launched a peer co-op mentoring program as a means to better support its students with their mandatory workplace co-op experiences. This program seeks to further engage and motivate second year students with information sharing and career strategizing with peers. This paper described the design of this mentorship program, feedback from program participants, and has identified four gaps that will be the focus of future improvement.

Acknowledgments

The authors wish to acknowledge the dedicated of the 36 senior B.Tech students for their time and energy to be peer mentors. We are also indebted to Megan Murphy, a PhD. candidate at McMaster’s DeGroote School of Business for the confidential interviews with the mentors in 2015-16 and Jennifer Long for the review of and feedback on this paper.

References


