

The Marathon Petroleum/ONU Engineer-in-Residence Program

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Introduction

Since its inception in 2001, the Engineer-in-Residence program has provided students at Ohio Northern University (ONU) with the opportunity to gain professional work experiences through employment with the Marathon Petroleum Company. The Engineer-in-Residence office is co-located within the facilities that support the College of Engineering at ONU and the Engineer-in-Residence from Marathon Petroleum typically spends two days a week in the office mentoring and guiding four students that work in the office. The Engineer-in-Residence program represents a unique collaborative relationship between ONU and Marathon Petroleum that serves to enhance the hiring program at Marathon Petroleum and to provide real-world work experiences for those ONU students who are employed by the office.

Now that the Engineer-in-Residence program has been in existence for an extended period of time, both Marathon Petroleum and ONU have taken a critical look at the program's outcomes in terms of the number of students that have been converted from Engineer-in-Residence students into full-time hires by Marathon Petroleum and the visibility of Marathon Petroleum within ONU's College of Engineering. This paper discusses these program outcomes in detail including a prioritization of the relative importance of the program expectations by both Marathon Petroleum and ONU and student survey results regarding program visibility.

Program Overview

The Engineer-in-Residence (EiR) program began in September 2001 and represents a unique collaborative effort between Marathon Petroleum Company, LLC, located in Findlay, Ohio, and Ohio Northern University (ONU) located in Ada, Ohio [1, 2]. As part of the EiR program, Marathon Petroleum leases space within the Biggs Engineering Building on the ONU campus for the EiR office. This office is staffed by a Marathon Petroleum engineer who guides and mentors four engineering students on engineering projects that are specified by Marathon Petroleum. Currently, the EiR office hires students who are pursuing undergraduate degrees in civil, electrical or mechanical engineering. The EiR program typically hires two students at the junior-year level and two students at the senior-year level with these students working 10-15 hours per week in the EiR office. The hiring process seeks to identify the strongest student candidates for the program and does not take into account the discipline of the student or the discipline of the current Engineer-in-Residence.

The EiR program provides a unique alternative to the traditional co-operative education program whereby, in the co-op program, students leave the campus environment for up to a year to work in a professional work setting and extend their undergraduate degree program by a year. In contrast, the EiR program allows students to complete their undergraduate degree in a four-year

time frame while picking up valuable employment experiences through project work that is accomplished through the EiR office. In addition, the Engineer-in-Residence is given the opportunity to interact directly with many students in the college by visiting various classrooms and discussing topics such as program management, project scheduling, etc.

A formal program agreement and lease agreement between Marathon Petroleum and ONU has been in place since 2001. All of the equipment located in the EiR office is owned and managed by Marathon Petroleum with ONU providing the office with both telephone and internet access through the existing university network. The Engineer-in-Residence typically staffs the office two days a week whenever ONU is in session. The EiR office shuts down during university breaks including fall, winter and spring breaks as well as during the summer months.

A total of 5 Marathon Petroleum employees have staffed the Engineer-in-Residence office at ONU since its inception in 2001. In addition, approximately 21 students have been hired by Marathon Petroleum to work in the office through the 2008-09 academic year. Of the students that have worked within the EiR office, 47% of these students have been hired by Marathon Petroleum as full-time employees. Overall, the EiR program has been viewed as a success by both Marathon Petroleum and ONU's College of Engineering.

Program Expectations

As anticipated, Ohio Northern University and Marathon Petroleum Company have a different set of expectations for the Engineer-in-Residence program. During the summer of 2008, ONU and Marathon Petroleum engaged in a number of conversations regarding the future of the EiR program, especially in light of the 7-year history of the office. These discussions led to a number of suggested improvements in the operation of the program and also led to the formulation of a survey to be administered to the students in ONU's College of Engineering.

Marathon Petroleum Program Expectations

In preparation for these discussions, managers and engineers at Marathon Petroleum's Marketing and Transportation Engineering (M&TE) division sat down to define a set of EiR program expectations from their perspective. The program expectations discussion included the M&TE managers who oversee the EiR office at ONU, the current Engineer-in-Residence, the M&TE human resources manager, and a former student who worked in the EiR office. This group of managers and engineers defined three expectations for the EiR program which are listed below in priority order:

1. Recruitment of full-time employees
2. Resource for project work
3. Public relations and name recognition

By far, the most important function of the EiR program according to Marathon Petroleum is for the office to serve as a tool for recruiting future employees of Marathon Petroleum. This includes those students who work within the EiR office as well as other students who become aware of Marathon Petroleum through the EiR office in addition to the traditional recruitment tools (e.g.,

career fairs, on-line employment sites, etc). Assuming that the students working in the EiR office achieve the performance goals outlined by their direct supervisor, Marathon Petroleum has an expectation of hiring the EiR students as they complete their senior-year at ONU. In addition, Marathon Petroleum also expects to hire ONU students through the traditional recruitment methodologies and hopes that these students have a higher appreciation for Marathon Petroleum as a potential employer.

The current Engineer-in-Residence has been particularly proactive in terms of interacting with the college's students and faculty through a number of activities. In particular, the Engineer-in-Residence has provided project management lectures to senior-year students, served as a project customer for a senior-level capstone design project during the 2007-08 academic year, and introduced real-world engineering examples from Marathon Petroleum operations into a power electronics course. All of these activities serve to increase the visibility of Marathon Petroleum on the ONU campus and within the College of Engineering.

According to the M&TE managers and engineers at Marathon Petroleum, the final two program expectations are significantly less important than the first program expectation. While the EiR students work on engineering design projects for Marathon Petroleum, the ability of the EiR students to perform this work is somewhat hampered by the fact that travel to project sites is limited due to the student course schedules. As such, the type of work that can be assigned to the students can be limited and may not be representative of the work the student may do as a future Marathon Petroleum employee. The Engineer-in-Residence must take these factors into consideration as he or she assigns activities to the students who work in the EiR office.

As part of the EiR program, Marathon Petroleum expects the College of Engineering to be an advocate of Marathon as a potential full-time employer of graduating seniors, to support and advertise the EiR program, to promote the use of Marathon presentations and examples in the classroom, and to encourage the Engineer-in-Residence to serve as a resource for the senior capstone design projects.

ONU Program Expectations

The faculty and staff in ONU's College of Engineering have not formally defined a set of expectations for the EiR program, however, it is clear that two program expectations have emerged from a number of discussions related to the operation of the EiR program and are listed below in priority order:

1. Recruitment of prospective students
2. Support and enhance ONU's accreditation process

First and foremost, the EiR program provides the College of Engineering a competitive advantage in terms of attracting the best and brightest students to study engineering at ONU. The EiR program is mentioned multiple times during the admission visits by prospective students as a wonderful way for students to gain real-world work experience while they are a student at ONU. The competitive nature of the program is also highlighted as well as the obvious advantage that the EiR students have in terms of gaining employment at Marathon Petroleum after they graduate

with their engineering degree. Another point that is made during the admissions process is that the EiR students essentially get the benefits of a co-op program while not having to spend an additional fifth year progressing towards their bachelor degree. The EiR office is highlighted during the prospective student tour of the college's facilities and students who work in the EiR office are encouraged to invite the prospective students into the office to further the discussions regarding the EiR program.

In addition, the Marathon Petroleum EiR program supports and enhances ONU's accreditation process by providing a unique opportunity for students to participate in an activity "to design a system, component, or process to meet desired needs within realistic constraints" and "to identify, formulate and solve engineering problems" (ABET Criteria 3(c) and 3(e)). While the EiR program is not a necessary component of the college's programs since other engineering programs are accredited without an EiR program, the existence of the EiR office within the college's facilities strengthens the notion that the college's programs take seriously the need to provide students with opportunities for significant professional design experiences as they pursue their undergraduate degree program.

Student Perspective

During the Winter Quarter 2008-09, the students in the College of Engineering were surveyed regarding their knowledge of Marathon Petroleum and the EiR program. The survey was distributed electronically to 426 students in the college with majors in civil engineering, computer engineering, computer science, electrical engineering, and mechanical engineering. Students were given two weeks to complete the survey with a reminder sent out to those who had not responded half-way through the time period. A total of 235 students completed the survey or 55% of the students in the College of Engineering. The number of students responding from each major is shown in Table 1 along with the total number of students in that major who were surveyed.

Table 1: College of Engineering survey responses by major

Major	Total Students	Total Survey Responses
Civil Engineering	92	47 (51%)
Computer Engineering	52	25 (48%)
Computer Science	22	7 (32%)
Electrical Engineering	77	40 (52%)
Mechanical Engineering	183	116 (63%)
<i>Total</i>	<i>426</i>	<i>235 (55%)</i>

The survey contained sixteen questions. Four questions were devoted to demographics and general college information (major, class standing, plans for participating in co-op program, reasons for not participating in co-op program). The remainder of the questions centered on the student's knowledge of the Marathon Petroleum Company, the work accomplished by Marathon Petroleum engineers, and the EiR program.

For the respondents, 40% of students stated that they plan to participate or have participated in the College of Engineering’s five-year co-op program. Of the students who chose not to participate in the five-year co-op program, the major reason provided was that students did not want to extend their engineering program to five years. Instead, they wanted to graduate “on time.” The majority of students not completing the co-op program (58%) stated that they obtained engineering experience through summer internships.

The results of the survey demonstrates some areas of fulfillment of Marathon Petroleum’s primary goal for the office; that is to increase awareness of Marathon Petroleum as an employer in order to improve recruiting efforts for several constituents including the EiR program, co-op program and full-time hires. Areas supporting fulfillment of the primary goal of the EiR program include:

- 73% of students would consider applying to Marathon for a full-time, co-op, internship, or EiR position in the future.
- 60% of students had knowledge of the EiR program.

The data showed that a large number of students obtained their information about the work performed by Marathon Petroleum engineers and the EiR program from other students. A summary of the student responses to questions regarding their knowledge of Marathon Petroleum’s work and hiring practices is shown in Tables 2 and 3.

Table 2: Source of student knowledge about type of work and hiring practices

Source of Knowledge	Responses to “Knowledge of work performed”	Responses to “Knowledge of hiring opportunities”	Responses to “Knowledge of EiR program”
Marathon employee presented in a class	77 (50%)	61 (46%)	86 (50%)
Attended a Marathon Information Session	33 (21%)	29 (22%)	29 (17%)
Attended an Open House at the EiR Office	29 (19%)	21 (16%)	26 (15%)
On-Campus Career Fair	29 (19%)	33 (25%)	16 (9%)
Bulletin board by the EiR Office	43 (28%)	39 (29%)	57 (33%)
ONU Career Services office personnel	0 (0%)	3 (2%)	3 (2%)
ONU Career Services On-line Job Search Software (Symplicity)	4 (3%)	7 (5%)	5 (3%)
Faculty Member	33 (21%)	30 (23%)	62 (36%)
Other Students	83 (54%)	53 (40%)	93 (54%)
Participated in a Marathon sponsored campus activity	2 (1%)	1 (1%)	1 (1%)
Other	25 (16%)	9 (7%)	6 (3%)

For example, regarding the work performed by Marathon Petroleum engineers, 40% of students knew about the type of work and the majority of them (54%) learned about it from other students. Additionally, 50% of students stated that they learned about it from a Marathon Petroleum employee presenting in one of their classes. Regarding the EiR program, 60% of

students knew about the office and, again, the majority of them (54%) learned about it from other students. Many of them (50%) also learned about the program from a Marathon Petroleum employee presenting in one of their classes. (Please note that students were allowed to select all answers that applied for this question.)

When asked about hiring opportunities with Marathon Petroleum, 43% of students had knowledge of opportunities, with approximately 40% of students gaining that knowledge from other students and 46% of students gaining that knowledge from a Marathon Petroleum employee presenting in one of their classes. (Again, students were allowed to select all answers that applied for this question.)

Table 3: Summary of questions pertaining to type of work and hiring practices

Question	Response		
	Agree/Strongly Agree	Neither	Disagree/Strongly Disagree
Have knowledge of work performed by full-time, co-op, intern engineers	92 (39%)	75 (32%)	67 (29%)
Have knowledge of full-time, co-op, intern hiring opportunities	96 (43%)	42 (19%)	86 (38%)
Have knowledge of ONU EiR program	137 (60%)	42 (19%)	47 (21%)

The survey showed that even though a majority of students had knowledge of the EiR program, fewer students knew about the type of work performed by Marathon Petroleum engineers or about the company itself. Therefore, the EiR office employees could place more emphasis on informing students about Marathon and the work its engineers perform in order to better meet the company's goals for the office.

Students were also surveyed (see Table 4) about whether or not they had applied to any undergraduate employment program (co-op, internship, EiR) at Marathon Petroleum. Only 13% had applied to Marathon Petroleum for a co-op, internship, or EiR position. However, there was no overwhelming reason given for not applying. It can be noted that of those who did not apply; 31% felt they had too many other commitments (such as varsity athletics and extracurricular activities), 23% already had another co-op or internship position secured, 17% did not meet the GPA requirements, and 16% stated that they did not have knowledge of the available opportunities. For graduating students who met the Marathon Petroleum requirements to apply, approximately 18% had applied to Marathon for a full-time position. Excluding those who did not have knowledge of the available opportunities, 80% had applied for a full-time position.

Table 4: Summary of questions about applying to Marathon Petroleum

Question	Response	
	Yes	No
Have ever applied for co-op, intern, EiR position	29 (13%)	194 (87%)
Have ever applied for a full-time position	8 (4%)	213 (96%)
Would consider applying for a full-time, co-op, intern, EiR position	157 (73%)	57 (27%)

Managers at Marathon Petroleum have reviewed the student survey results and will use the information in the survey to determine if there is any particular group (class, discipline, etc.) that appears to be missed by Marathon's current recruitment efforts. Once these groups are defined, new strategies will be developed to make sure these students are include in the future.

Conclusions

This paper has provided a summary of the Marathon Petroleum/ONU Engineer-in-Residence program in terms of the program outcomes, program expectations, and the current student perspective regarding the EiR program. The student survey results have been particularly helpful in terms of understanding the reasons why students choose to pursue employment opportunities with Marathon Petroleum as well as the reasons why students do not pursue employment with Marathon Petroleum. In addition, the formalization of the program expectations has been useful in terms of guiding possible changes and improvements to the program. Overall, the program has been viewed as a success both by Marathon Petroleum and ONU with both organizations continually seeking to improve the program in the years to come.

References

- [1] B. Farbrother and M. Chow, "Paralleling the Workplace on the University Campus: The EiR Program at Ohio Northern University," *Proceedings of the 2003 ASEE Annual Conference*, Nashville, TN, June 2003.
- [2] B. Farbrother, K. Stoodt, B. Crombie, R. Korkos, M. Launsbach, J. Wagner, and K. Zwingler, "Win, Win, Win: The Engineer in Residence Program at Ohio Northern University," *Proceedings of the 2004 ASEE Annual Conference*, Salt Lake City, UT, June 2004.