

Evaluation: Bridging the Gap- Technical Learnings

Africa Catalyst Programme
Institute of Engineers Rwanda

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Summary

The Institute of Engineers Rwanda (IER) designed the project around a core justification; that a gap exists between the theoretical knowledge and practical skill that graduate engineers hold. Whilst graduates possess strong theoretical grounding in engineering, limited opportunities and exposure result in low skill development. In turn, this lack of practical experience proves to be a barrier for employment. To address this gap, IER designed a project which would focus on raising the practical skill level of graduates.

The evaluation below considers the project as a whole before focusing on identifying the initial outcomes that have occurred as a result of the programme. In general, the work and effort put in by IER has been to a high standard. Their reasoning for the programme is sound and the overwhelming feedback from beneficiaries, mentors and construction firms was positive.

The most significant point for improvement is the length of the placements but given the funding budget and timelines, there is little IER could have done to improve this in this instance. Moving forward, it is the understanding that IER is aware of these consideration and amendments and adjustments would be made for further funding applications and project design.

Key Achievements

100% of interns completed their placements

100% of interns received excellent (58%) or good ratings[1]

68% of interns felt their theoretical knowledge had increased[2]

100% of interns felt their practical skills had increased[2]

1. Based on the post programme evalation completed by the internee mentors. Evaluations were submitted for 24 out of 30 interns.
2. Based on the post programme survey completed by interns. Survey's completed by 25 out of 30 interns.

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Project Justification

The table below considers the primary justifications for carrying out the project alongside evidence obtained during the evaluation process. As is seen below, the reasoning for designing a project which offered graduates a practical engineering placement was justified.

	Justification	Evidence
	Engineering students graduate with a strong level of theoretical knowledge but weak practical skill	✓ The average rating for theoretical knowledge was 8, in comparison to practical skill at 5[1] ✓ All interview respondents stated that the gap in their knowledge was around practical skills and application of taught knowledge[2] ✓ Engineering syllabus in Rwanda universities prioritises theoretical knowledge. Some practical placements are provided for 2 months. ✓ One company owner and mentor remarked whilst interns had some practical knowledge, it was out of date.[3]
	Weak practical skills and lack of documented experience make it difficult for engineering graduates to secure employment	✓ All interview respondents stated that lack of experience as a significant barrier to employment.[2] ✓ 32% of interns had applied for but not obtained jobs.[4] ✓ Private sector and construction companies remarked that lack of experience made them hesitant to hire individuals due to the investment into their development that would need to be expended[5]
	Opportunities for graduate engineers to get practical experience is limited	✓ Only 16% of interns had held temporary positions of longer than nine months, many of these being made up of three, three month placements.[4] ✓ Private sector and construction companies do offer internships, but these are unpaid. ✓ All interview respondents commented that they would not be able to complete these practical placements without remuneration.[2]

Candidate Selection and Training

Candidate Selection and Examination

The project offered the opportunity for 18 civil, 6 mechanical and 6 electrical engineers who had recently graduated to undertake a two-month practical placement. To select candidates for the programme, IER invited applications to complete an assessment test, the results of which would decide which applicants gained places on the programme. In the first instance, applications were only sent to graduates who had registered with the institute, a call out that resulted in only a hand full of applications. Realising the limitations to this approach, IER expanded their remit, reaching out to

[1] This score was obtained from the post programme survey completed by 25 out of 30 interns. The question asked interns to rate their techincal knowledge and practical skill at the start of the programme.

[2] Based on interviews conducted with 10 out of 30 interns. Summaries provided in the document: Interviews- Bridging the Gap

[3] Interview conducted with Jean Sauveur Uwintwari

[4] Based on results from post programme survey completed by 25 out of 30 interns

5 Based on interviews conducted with programme mentors and private companies

universities in Kigali and their networks, resulting in a total of 54 applications being submitted. It was well noted that IER rapidly responded and adapted its application process to increase applications but the focus on institutions in Kigali may have resulted in graduate engineers stationed around the country being less likely to access the programme.

Once applications had been received, applicants undertook an assessment test, the top performers being admitted to the programme. The tests were developed by senior engineers for each engineering profession, the content of which was designed to be particularly rigorous. In reviewing this process, the evaluation noted that the process was conducted in a fair and clear way, with no recommendations for improvement.

Training

Prior to placement, all interns took part in a training workshop designed to prepare for them for placement. As the workshop was undertaken at a different time to the evaluation visits, specific comments on the content and delivery of the workshop cannot be made. Based on interview responses, it is possible to comment that interns found the training to be useful and was good preparation for site. Based on the responses captured from the interviews, one key recommendation put forward for future projects is the development of a professional development plan for each intern. This plan would outline the key skills the intern hopes to gain during their placement, enabling to make a placement plan with their mentor and more systematically map their progress against this.

Placements

Placements were located across Rwanda, reflecting IER's commitment for the project to impact not only Kigali but also secondary cities in Rwanda. This being said, 20 out of the 30 placements were in Kigali, but it is understood that this reflects the level of construction and is not a major concern.

When asked about their placements, interview respondents were very positive, highlighting that the opportunity to be on a working site was providing them with invaluable experience and enabling them to build capacity in a way they had not been able to before. It was also strongly noted that the provision of a stipend by IER for the placements had been crucial in their ability to take part in the programme. With each placement lasting two months, the length of placement was the subject of most feedback. 100% of interns[6] responded that the placement period was too short, with not enough time given to experience the construction cycle and their development being cut short. This call for longer placements was echoed by mentors and construction companies. It was put forward by mentors that at a minimum the internship should last four months, but the ideal would be six months.

Initial Outcomes

The three main outcomes that were identified through the evaluation process were:

1. Increased practical skill
2. Increased soft skills, particularly project management
3. Improved professional networks

[6] Based on the post programme survey completed by interns. Survey's completed by 25 out of 30 interns.

As the primary objective of the project, the increase in practical skill was an anticipated outcome. All interns[7] felt that their practical skill had increased, with an average score[8] of five being given for their pre-project practical level in comparison to eight at the end of the project. This increase was supported by feedback from mentors, captured in both the interviews[9] and in the post placement reference forms. Although the increase was evident, the evaluation did notice that in some cases the increase in practical knowledge was limited to a specific element of engineering practice. This was due to the short placement time, with interns only learning skills relevant to their site at that point of construction. It was noted that interns whose placement company had multiple sites gained a broader breadth of skills as they could work on construction projects at different stages.

In the completion of the post project surveys, 30% of the interns[6] marked project management as one of the primary skills they had acquired through their placement, the highest response for any specific skill. The development of soft skills had not been specifically highlighted as an outcome of the project but the development of these skills is a good indication that the project is impacting on skills that will raise professionalism in engineering.

Finally, the third outcome that was captured in the evaluation process was the opportunity the project gave graduate engineers to build professional networks. Identified through the interview process, many of the respondents remarked that through their placement on a construction site, they had been given an opportunity to showcase their skills to senior professionals and construction firms, as well as building relationships. The interns felt that the ability to gain this exposure put them in better stead for future job applications and offered them a network on which to draw on.

Sustainability

One of the key concerns identified by the evaluation was the sustainability of the model. Whilst it was clear that such internships were providing invaluable opportunities to graduates, the need for longer and stipend placements was overly reliant on Royal Academy funding. Although no definitive solution was identified to increase the security of the project, the following options could be considered by IER:

- Increase the yearly IER fee for corporate members, reinvesting the additional revenue into graduate internships
- Lobby the government to provide funding for engineers to undertake practical placements, either during university or after graduation
- Work with universities to adapt the engineering syllabus to include more practical placements
- IER to identify additional funding sources

Key Recommendations

- Placements of six months
- Intern development plans
- Placements with companies that can offer more than one site, especially in the case that placements remain at two months

[7] Based on responses from 25 out of 30 interns.

[8] This score was obtained from the post programme survey completed by 25 out of 30 interns. The question asked interns to rate their practical skill level on a scale of 1 to 10 (1 being the lowest and 10 the highest) at the start and end of the project.

[9] See document: Interviews- Bridging the Gap