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VoR (Version of Record)

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REPOSITORY RECORD

Rugumayo, Albert, and Charles Niwagaba. 2019. “Training of Engineering Students Through District-focused Internship Attachments”. figshare. https://hdl.handle.net/2134/29272.

31st WEDC International Conference, Kampala, Uganda, 2005

MAXIMIZING THE BENEFITS FROM WATER AND ENVIRONMENTAL SANITATION

Training of engineering students through district - focused internship attachments

A.I. Rugumayo and C. Niwagaba, Uganda

Rural areas of Uganda have been experiencing a shortage of adequately trained district technical staff. Many graduate engineers are unwilling to offer their services to the rural areas. Furthermore, those that eventually go to the rural areas are ill prepared and are not readily accepted by the district staff. This has resulted in the inadequate capacity for the technical management of the district's needs. In order to address this situation, Makerere University with support of Rochfeller Foundation initiated a Pilot Project. Eleven civil engineering students were trained in a pilot district for a period of seven weeks. The training was done on a week rotational basis around the different departments of the district of local government. This paper describes the development of the pilot project and the experience of the students, the districts and staff of Makerere together with the lessons learned and the way forward.

Introduction

As part of its annual training activities for undergraduate students, the Faculty of Technology in Makerere University attaches its students to the world of work for industrial training for ten weeks, during the recess term. Many of the students end up in the urban areas, especially in Kampala. Upon completion of their studies, they are unwilling to go and offer their services to the rural areas where most employment opportunities are. Those who do, are ill prepared for the tasks at the districts and may not be readily accepted by the district staff. This has resulted in inadequate capacity of the district technical staff for technical management of the districts' needs. Furthermore, lecturers at the University have little or no interaction with the district staff and may not appreciate the needs at the district. Neither is there a sensitization programme to link the district to the training institutions.

According to the findings of the feasibility study, both the need and opportunities for on the job training of future district technical staff existed in all the districts visited (Apac, Hoima, Kabale, Kamuli and Mpigi). All the districts had planned ongoing infrustructure projects involving building of schools, Teacher Development centers, health units, feeder roads, construction of water supply schemes(gravity flow schemes, spring protection, shallow wells, rainwater harvesting tanks etc. Practical training opportunities were therefore available in the districts.

Objectives

The overall objective of this project was to produce graduates that are better suited to meet the evolving needs of the districts. In addition, it was expected to enhance delivery of services at the district level through the implementation and subsequent interaction with the district staff.

Specifically the project was expected to:

- Improve the capacity of graduates (engineering) to appreciate the need and conditions of operation at the decentralized levels through focused practical trading that will improve their problem solving skills.
- Improve the problem solving capacity (and research) at the districts through enhanced collaboration between the trainers (from Makerere), the students and the district stakeholders
- Generation of new knowledge and possibilities for improved curriculum, through the interaction.

Methodology

The following activities were undertaken during the pilot phase of the project:

- A training programme was prepared by the Makerere staff together with the district staff. The programme gave the students an opportunity to rotate around the departments of the Directorate of Works and Technical Services of the District Local Government.
- A one day orientation workshop was held to acquaint the students and Makerere University staff to the district staff and the stakeholders.
- The students were involved in the typical activities of the district technical staff, as they were rotated round the different technical departments of the District Local Government.
- An evaluation workshop was held to asses the pilot phase of the project.
- The pilot study report was prepared at the end of the project.

Selection of a pilot district

During the feasibility phase five districts were visited (Apac, Hoima, Kabale, Kamuli and Mpigi). The feasibility study was carried out to identify one or two districts that could offer the best opportunity for the training of the students. It was noted that the all the districts visited could offer opportunities for training. However, the district with the best opportunities was chosen. This being the pilot phase of the project, it was decided for maximum benefit, efforts should be concentrated in one district. Financial constraints were another reason for concentration the efforts in one district.

Selection of students to train under the project

Towards the end of the second semester in July 2001, a circular was put up in the Faculty of technology notice board inviting interested students to train in Kabale under the Rockefeller funded Project for Capacity Building for Decentralization. Registration was open to both second and third year engineering students. Eleven students were chosen on a first come first serve basis.

Introductory workshop

An introductory workshop of the Makerere staff, students, the district staff and stakeholders was held on 23rd July 2001 in Kabale Rukiiko Hall. The workshop was aimed at introducing the players to each other, presentation and discussion of the training programme and proposed rosta with the district staff.

Training session

The students were divided into four groups to undertake training on a rotational basis for a period of seven weeks.

Evaluation workshop

An evaluation workshop was held at Victoria Inn Hotel in Kabale on 6th September 2001. The aim of the workshop was to assess the project and come up with recommendations for future improvement.

Kabale district industrial training

Introduction

Kabale district was chosen as the pilot district. Industrial training was carried out starting from 23rd July 2001 to 6th September 2001. The training was done in three main areas/Departments of the Directorate of Works and Technical Services of the District Local Government, namely; Roads Department, Buildings Department, and Department of Water. The fourth area was the Southwestern Towns and Water and Sanitation Project (SWTWSP).

Roads department

This department was under the Directorate of Works and Technical services, and was headed by the Director of Technical Services (DTS). The activities carried out included the maintenance and opening up of feeder roads.

The works carried out included; routine maintenance, periodic maintenance, rehabilitation and opening of new roads. The students had an opportunity to train with local companies that were carrying our periodic maintenance. AFRICARE (and NGO in Western Uganda) was involved with the rehabilitation and opening up of new roads. The students had hands on experience working with the AFRICARE Engineers on the road projects.

Buildings department

This department was also under the Directorate of Works and Technical services. This department was responsible for all Government owned building construction These included classroom blocks, Teacher Development centers, health centers, Doctor's houses in health centers and alike.

Water department

This was headed by the District Water Officer. The department was responsible for monitoring all water and sanitation projects in the district. The students gained practical experience in the construction of water and sanitation facilities such as; gravity flow schemes, spring protection, shallow well construction, school latrine construction, construction of rainwater harvesting tanks.

South Western Towns and Water and Sanitation Project (SWTWSP)

SWTWSP is a Government of Uganda project assisted by the Government of Austria. It was in involved in the provision of water and promotion of sanitation in growing centers of the southwestern region. The students took part in the construction of Ecological Sanitation toilets in Kabale town and its peripherals.

Stakeholders and their roles

In order to bridge the gap between the trainers (at Makerere University) and the districts, thereby matching training with decentralization requirements, it was considered a necessity to involve a number of key district stakeholders in the pilot phase activities. The stakeholders that were involved included the Chief Administrative Officer, District Planner, Personnel Officer and his assistants, Director of Technical Services and works, District Engineer, District Water Officer and his assistants, NGOs (AFRICARE), SWTWSP staff and contractors (Spencon Services (U)Ltd.

The District staff was involved in the deployment and the supervision of the students while carrying out field based activities.

Indication of success

The following indicators were used to measure the success of the pilot phase of the project:

- Eleven undergraduate students were successfully trained in Kabale District as part of their internship.

- The district staff fully participated in the programme and showed willingness for continued cooperation with Makerere University staff and students in activities of this nature. They also expressed interest in collaborative applied research that can solve the districts' needs.
- The Orientation and the Evaluation Workshops that were held in the district were a success.
- Relevant research areas/topics aimed at solving the problems at the districts were identified. The District staff together with the Makerere University staff and the students identified the following possible research topics: Effects of Landslides on construction and maintenance of roads as well as their mitigation, Acidic water problems in Kabale District, Drought Analysis, Occurrence and possible mitigation.

Potential risks and constraints

An evaluation of some of the assumptions and risks that had been anticipated during the preparation of the pilot phase are listed below:

- The funds were not released on time and this did not give the trainers adequate time to prepare the training materials.
- It was assume that the students would be willing to train in the district and that once they were deployed, that they would stay there until the end of the training period. This happened as it had been anticipated.
- The district staff actively participated and their cooperation enabled the project to progress well; as it had been assumed.
- That the team of lecturers and students would be readily adaptive to the local conditions in Kabale District and no time would be lost. There was no problem in this respect.
- That Security would prevail throughout the training period; and this was the case.

A sample students' report

At the end of the training the students wrote reports that gave their individual detailed accounts of the training period. These reports were assessed by the University staff and the assessment contributed to the final degree that students would obtain at the end of their studies. The general layout of the report was composed of an introduction, an account of the work carried out during the training and a conclusion.

Introduction

In the introduction the objectives of the training, a brief description of the project (Makerere University Capacity Building for Decentralisation) and the background of the District (Kabale District) was also included. The information about the district that was given was the location, administration, and population of the district.

Main body

The work carried out in the various departments of the Directorate of Works and Technical Services of the District Local Government and the SWTWS project was included. To give a comprehensive report on the various departments a brief introduction into the activities of the department was given including the administrative structure. The students went on to detail the work that was done; as shown in the methodology.

Challenges faced, conclusions and recommendations

The students also included the challenges faced, conclusion on the training and recommendations for future training. It was noted that the existing technical manpower in the district was inadequate to meet the needs of the district; this was evident in the reporting of poor construction techniques. The students also noted that there were many available researchable areas and training opportunities. The students expressed satisfaction in the practical experience that they gained and the managerial exposure.

The students also made some recommendations that are list below:

- Introduction of more courses into the university curriculum that would prepare them for work in the District, such as the preparation of Bills of Quantities and Building Economics.
- The rotation of the students during training should be flexible to enable the student to shift to other departments where there is ongoing work.
- The training should be structured such that the students spend more time on construction sites of each department.
- The students cited the need for the inclusion of managerial skills in their training; through lectures by non-technical staff.
- The district staff should also include the training of students in their budgets.

Expenditure

The total project cost was US$ 10,000 (Ushs. 17,250,000/=). The funds were used on the following activities:

- Selection of participants and communication with the district staff.
- Introductory workshop
- Student expenses(Field training period)
- Makerere Staff Expenses (Field training period)
- Evaluation workshop
- Students' accommodation and welfare at Makerere University
- Reports and other expenses

Conclusions

- There was enhanced appreciation of the technical requirements within the district by the university staff. This was as a result of the open discussions between the District field staff and the university staff.
- Relevant Research areas/topics aimed at solving problems at the district were identified. Two students further on carried out final year projects that were related to their work during the training carried out in the district.
- The students gained considerable experience in the district operations and problem solving. Because of the reportedly good working relationship with colleagues and supervisors at work, their ability to work with professionals and communities greatly improved.
- Due to exposure, it was hoped that service delivery efficiency would be improved, once the students returned to take up positions in the District Local Government.
- During the training period, it was noted that the District development plans had already been submitted (since the new financial year had just began), therefore the students, unfortunately did not participate in the development planning of the district. However, the concept was explained to the students.

Recommendations

In view of the fact that there were measurable indicators of success of the pilot phase of the project, it was highly recommended that:

- Full implementation of the project should be planned for.
- A large number of students should be involved each year in undertaking industrial training in all the districts since their exposure would improver their ability to solve problems.
- For successful and sustainable training of students, the districts should have a specific training budget.
- There should be continual cooperation and interaction between the District staff and the University trainers for problem identification and subsequent solutions.
- There should be fora for disseminating University based research findings so that they reach the communities for whom they may be useful.

Way forward

1. This is a very useful approach for training university students, then staff and the district staff.
2. It provides opportunity for all the needsof the respective parties to be appreciated so as to determine a way forward.
3. Because of its success, Rockfeller has continued to sponsor subsequent years.

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