# Using graduates as key stakeholders to inform training and policy in health professions: The hidden potential of tracer studies

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Background. Tracer studies are alumni surveys that attempt to track activities of graduates of an educational institution, which enable the contextualisation of these professionals through a dynamic and reliable system to determine their career progression. It also enables the gathering of information to feed back into training institutions and to inform policy bodies on key issues. The purpose of this study was to track career paths of radiography graduates in Uganda, examine their contribution to their profession, and establish their opinions on how to improve training and inform policy.

Methods. A cross-sectional descriptive survey of radiography graduates who completed their training between 2001 and 2011 was conducted. Names of graduates were obtained from university records and contact details were sought from the register of the Uganda Radiographers Association, Facebook, Twitter, and friends. Data were collected using a self-administered questionnaire distributed electronically to the students. In a few instances, the survey was completed telephonically.

Results. A total of 90 questionnaires were sent out; 72 (80%) were returned. The majority of the respondents (95.8%) were employed as radiographers at the time of the survey and were all satisfied with their work. A significant number were employed abroad, while those who remained in the country worked for private health facilities and only a few worked in government health facilities. Key suggestions were identified to improve training and influence policy.

Conclusion. Graduate radiographers were generally satisfied with their current work. Many trained radiographers, however, are leaving the country, thereby creating a skills shortage in the government healthcare system.

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Tracer studies are alumni surveys that attempt to track activities of graduates of an educational institution.[1] According to Boaduo et al.,[2] tracer studies enable the contextualisation of graduates of a specific institution through a dynamic and reliable system in order to determine their career progression. Such studies also enable the evaluation of training provided by institutions, graduates' career paths, nature and status of employment, professional and job satisfaction, and geographical distribution.[3] It is particularly important for policy makers to assess the presence, status and distribution of the health workforce within a country or region, which subsequently contributes to planning.[1]

Health professions training institutions in Africa have paid much attention to transform and align training with the health needs of communities and current global trends.[4] For example, teaching and learning have been modified, moving away from the traditional didactic teacher-centred approach to the student-centred, competency based, community-orientated and transformative learning approaches.

All of these are aimed at improving the quality of graduates and providing them with the necessary skills and competencies to address community health needs. Many health workers have completed this training. Consequently, evaluation studies have been conducted at training institutions in Africa and worldwide, aiming to further improve the training of future healthcare professionals.

However, most of the aforementioned evaluation studies focus on the training process, including course delivery, materials, content, resources and tutor performance.[5] These evaluations normally culminate in curricular reviews and reforms facilitated by education experts, and graduates of these programmes are rarely consulted for their input. Often, faculty in training institutions are detached from the workplace environment of many healthcare workers, the latter frequently being in a better position to offer opinions on how the training needs to be adjusted to meet the required demands on ground level. Their responses can also gauge the level of satisfaction with the training in relation to work demands, which can assist trainers in initiating improvements in cases of dissatisfaction.[6] Schomburg[3] suggests the use of tracer studies as a method of acquiring useful information from graduates to feed back into the training process. Such information can be used to make the necessary adaptations to impart skills demanded in the work environment and to improve the quality of the training. It can also be used as a marketing tool for the institution's programmes.[7-11]

Iloeje[12] reported that surveys of graduates are important tools for institutional development because of systematic feedback from former students. The opinion of former students and their retrospective assessment of the training are not only likely to stimulate curricular debates, which can be very useful to current or future students, but also to inform policy makers and institutions about the contribution of these professionals to national development.[13]

The current study focused on tracing radiography graduates from Makerere University, Kampala, Uganda over a 10-year period. Radiography training at a Bachelors degree level in Uganda commenced in 2001 at Makerere University. Although training has been ongoing, there are no data regarding the career status of the graduates and the impact of their training on their lives or the healthcare system. The graduates have also not been contacted to feed back their comments into the training programme for improvement of training. Therefore, the aim of this study was to track the career paths of radiography graduates to examine the retrospective contribution of their training to their current work demands and to use their views to improve the training of current and future students in an attempt to influence policy formulation in healthcare planning.

## Methods

### Study design

A cross-sectional descriptive study was conducted at the School of Medicine, College of Health Sciences, Makerere University, Kampala, Uganda.

### Participants and sampling

The study involved radiography graduates (N=90) who completed their training between 2001 and 2011. All were eligible to participate in the study and their names were obtained from Makerere University records. The contact details of the graduates were sought and obtained from multiple sources, including the register of the Uganda Radiographers Association, social media channels, e.g. Facebook and Twitter, and friends of former students.

## Data collection

Data were collected using anonymised self-administered questionnaires distributed by e-mail to the graduates (N=90). Questionnaire items were developed by the researchers from an initial critical review of the literature on the subject. The questionnaire was then piloted with two graduates and improvements were made before administering it to ensure validity of the instrument. Information was sought regarding demographic information of the graduates, job placement profiles, factors vital to obtaining employment, and how the radiography curriculum was relevant to eventual job requirements.

## Data analysis

Data were majorly quantitative and analysed by a statistician in the presence of the researchers. Responses from the questionnaires were tallied, coded, counted and entered into an Epi-Info statistical package to obtain percentages and frequencies, the final data being presented by means of descriptive statistics.

## Ethical issues

The questionnaire did not identify the names of the respondents. They could opt out of te study at any one time. Data were kept securely and only accessed by the researchers. Ethical approval to conduct the study was granted by the Review Board, School of Medicine, Makerere University.

## Results

Ninety questionnaires were sent out and 72 (80%) were returned.

## Sociodemographic profiles

The demographic characteristics of the respondents are summarised in Table 1. All the respondents were registered with the Uganda Radiography Board and Allied Health Professionals Council. Being lawfully registered is therefore one manifestation that the qualification obtained was recognised and accredited by professional bodies.

Table 1. Sociodemographic profiles

| Demography | % (*n*) |
|---|---|
| Gender | |
| Males | 59.7 (43) |
| Female | 40.3 (29) |
| Age distribution (years) | |
| 25 - 29 | 83.3 (60) |
| 30 - 34 | 15.3 (11) |
| >34 | 1.4 (1) |
| Marital status | |
| Married | 16.7 (12) |
| Single | 83.3 (60) |

**Job placement profiles**

All respondents were employed at the time of this survey. Table 2 illustrates job placement status and distribution at the time of the study.

**Table 2. Current employment and satisfaction status and distribution of radiographers**

| Employment status | % (*n*) |
|---|---|
| Employed | 100 (72) |
| Unemployed | 0 (0) |
| Full- time employment | 97.2 (70) |
| Part-time employment | 2.8 (2) |
| Employment related to radiography/imaging | 95.8 (69) |
| Employment not related to radiography/imaging | 4.2 (3) |
| **Satisfaction with employment** | |
| Very satisfied | 45.8 (33) |
| Satisfied | 54.2 (39) |
| Less satisfied | 0 (0) |
| Dissatisfied | 0 (0) |
| Very dissatisfied | 0 (0) |
| **Distribution of radiography graduates** | |
| Ugandan public facilities | 5.8 (4) |
| Ugandan private facilities | 68.1 (47) |
| Outside Uganda | 26.1 (18) |

As all graduate radiographers were employed and satisfied with their work, it illustrates that the demand for radiographers in Uganda and beyond is currently high. All the respondents working in radiography and imaging or related work reported holding more than one radiography appointment simultaneously, and all of them reported working in major urban centres. Thirty (41.7%) reported practising radiography at three different venues.

Those who left Uganda worked in Kenya, Cameroon, South Africa, Namibia, Australia and the UK. Therefore, many graduate radiographers left the country to work abroad, while those who remained worked for private health facilities, and very few sought employment in government health facilities. Of the three radiographers who were not engaged in radiography-related work, two were operating private businesses unrelated to radiography and imaging and one was engaged in agriculture. On the survey tool, these three radiographers reported poor remuneration as the major reason for engaging in other work.

Regarding satisfaction with their current work, 84.7% (n=61) said they were happy and satisfied with their work. With regard to further training, 25% (n=18) had either acquired a postgraduate qualification or were engaged in postgraduate training, leaving 54 (75%) without postgraduate education.

**Factors that contributed to obtaining employment**

Fifty (69.4%) of the respondents said their study record had bearing on obtaining employment as radiographers, indicating that many employers still value the academic merit of graduates. Again, 50 (69.4%) said generic skills, including communication, interpersonal skills and problem-solving skills, were key to obtaining employment. Twenty (27.8%) respondents indicated that limited experience was a major factor affecting their employment prospects and 10 (50%) of these said they had to first perform volunteer work at their workplace before finally being offered full-time jobs.

**Relevance and satisfaction with regard to curriculum subjects**

The majority of the radiographers reported that various curriculum subjects were indeed relevant to their practice (Table 3). The majority of respondents were generally satisfied with most subjects of the radiography curriculum, except two areas, i.e. X-ray image interpretation and research skills. All 72 respondents commented that being graduates, employers expected more input from them in giving opinions on X-ray images.

**Table 3. Satisfaction with radiography curriculum components**

| Component | % (*n*) |
|---|---|
| Community health courses | 100 (72) |
| Research skills | 27.7 (20) |
| Plain radiography | 100 (72) |
| Fluoroscopy | 100 (72) |
| Computed tomography | 100 (72) |
| Ultrasound | 100 (72) |
| Mammography | 76.4 (55) |
| Magnetic resonance imaging | 66.6 (48) |
| Nuclear medicine | 68 (49) |
| Dental radiography | 100 (72) |
| Clinical/practical hours | 62.5 (45) |
| X-ray film interpretation/pattern recognition | 13.8 (10) |

Community-based training courses were rated highly by the graduates. All respondents suggested that strengthening the research component in the radiography curriculum should be addressed, and 10 (13.8%) of them had been denied entering postgraduate studies owing to this. It can therefore be concluded that the curriculum is largely relevant to the current demands, but needs to be improved to address the identified gaps.

**Discussion**

The majority of the graduates were in their mid-20s - mid-30s as the study covered 2001 - 2011, bearing in mind that the radiography degree course started in 2001. More male than female graduate radiographers were trained during 2001 - 2011. Although admission criteria do not discriminate on the basis of gender, more males than females tend to work in science professions in Uganda. The majority

of graduates were single, probably because many were establishing themselves and building up their careers.

Regarding training, most respondents cited the crucial role of generic skills (e.g. communication, inter-personal skills, and problem solving), besides technical knowledge and skills, in obtaining employment. It is therefore important to inculcate generic competencies such as professionalism, inter-disciplinary training, leadership, management, communication and inter-personal skills during radiography training. Additionally, training of undergraduate radiographers needs to include basic aspects of image interpretation and reporting, research skills, independent student research projects, and more time for practical and clinical training. These are some of the key issues that need to be addressed urgently by, for example, curricular reviews.

Former radiography students clearly supported community health courses in the radiography curriculum. They normally undertake these during community placements, together with students from other disciplines, e.g. medicine, nursing, dentistry and pharmacy. These courses focus mainly on primary healthcare activities, community settings and community empowerment. The explanation for the observed interest in such courses is probably because students are then exposed to work in rural communities, where they are likely to be employed, away from teaching hospitals. Additionally, students then have opportunities to interact closely with their colleagues from other disciplines, thus appreciating the role of teamwork in healthcare delivery.

A significant number of graduate radiographers have left Uganda to go abroad, while the remaining few hold more than two radiography positions in their daily work schedule, mostly in private urban health facilities. Holding more than two jobs results from poor pay and the limited numbers of radiographers. This trend is not only limited to radiographers, but also applies to other health professionals and science graduates in Uganda.

Many radiographers leave the country in search of training opportunities and career development. Few radiographers have the opportunity to pursue postgraduate studies for career growth, mainly because Uganda has had no accredited postgraduate programmes in this discipline. This drawback is found in many African countries outside South Africa. When radiographers leave for further training abroad, many never return, further constraining the remaining workforce. Therefore, training institutions, professional associations and other government bodies should initiate career advancement programmes locally. This is likely to reduce the number of radiographers who leave the country, as has been observed in other reported studies.[14]

It is also possible for governments to formulate policies that call for rural community service programmes for newly qualified professionals, not only radiographers, but also other health professionals. In such a programme, new graduates can work in rural community facilities under supervision and be remunerated by government for at least a year before registration. This would benefit both the graduate and the government, with the former gaining much-needed experience and mastery of skills, and the latter maintaining a continued presence of health workers in underserved areas. It is implied that rural communities have a higher shortage of radiographers, as all respondents were working in the major urban centres. This could be because urban centres have more private health facilities and it is possible to be employed in more than one workplace. However, this study did not specifically set out to investigate disparities in radiographer distribution between rural and urban settings and the possible causes of such disparities. This is therefore an area that warrants further research.

This study has highlighted that alumni surveys can generate useful information to feed back into the training process, thus enhancing the quality of teaching and learning. Useful information can also be generated from tracer studies, which can assist in formulating policies aimed at retaining health workers in areas where they are most needed. Although this study focused on radiography graduates, some findings are also most likely applicable to many other health professions.

The study has some limitations. Firstly, the researchers did not conduct individual interviews or focus group discussions to obtain qualitative experiences of the participants, mainly due to difficulties in accessing the participants physically. Perhaps in-depth qualitative interviews or focus group discussions would have provided more data to supplement the questionnaire data. Secondly, the study focused on radiography graduates from one institution and findings may not be fully applicable to those from other institutions or even to all other healthcare professions. However, the study still provides a foundation to further explore tracer studies to inform both training and policy decisions.

**Conclusion**

This study has shown that tracer studies can be useful for gathering information that positively impacts on training and policy. The majority of graduate radiographers in this study were satisfied with their work, but made suggestions, such as improving their remuneration and reviewing curricular content, to address the current demands in the work environment. Training institutions are therefore called upon to engage graduates as key stakeholders in enhancing learning, while government bodies are called upon to utilise the information from graduates to formulate appropriate policies that positively influence healthcare delivery.

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