

Solving the Surveying and Geoinformatics Undergraduate Student Enrolment Problem: The University of Lagos Experience



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Abstract

The first Survey School in Nigeria was established in 1908 as a Departmental post-secondary school, to cater for the education of the country's youth who could not proceed overseas for further training. But it was not until 1962 that the first Department of Surveying in a Nigerian University was established at the University of Nigeria, Enugu Campus. In 1970 the University of Lagos (UNILAG) also began the training of Surveyors by establishing a Sub-Department of Surveying in her Department of Civil Engineering. The sub-department became a full fledged department in 1973. About the same time survey training started in UNILAG, another Department of Surveying was established at the Ahmadu Bello University in Zaria, in the northern part of the country. All these departments were domiciled in the Faculty of Engineering. At present, there are eleven Universities in Nigeria, offering courses in Surveying and Geoinformatics leading to the award of Bachelor's and other degrees.

One common and major problem faced by all the Universities is in recruiting interested and qualified candidates as students in their respective departments. This problem is aggravated by the large number of Universities struggling to recruit limited number of available qualified candidates. Other factors contributing to this problem include the following: the very low regard and poor publicity for Surveying profession in Nigeria, perception of poor career prospects for graduates in Surveying, poor financial yield for Surveying professionals, centralized admission process in the University and the stringent uniform requirements for all courses in the Faculty of domicile, and the physically demanding, and sometimes boring nature of some aspects of the training of Surveyors.

The Department of Surveying and Geoinformatics, University of Lagos, has taken some steps to solve the problem of recruiting qualified candidates into the department. These include: organizing career talks in Secondary Schools, making admission requirements more relevant, encouraging and engineering positive publicity for the profession, and undertaking a review of the curricula, to make the course more interesting and attractive to young school leavers. The result of the efforts made at University of Lagos has generated a lot of interest in the profession amongst the students. By the 2008/2009, the Department had been able to fill its admission quota with qualified candidates, almost exclusively from those who indicated Surveying and Geoinformatics as their first choice course, in the central admission system.

Introduction

Surveying is one of the oldest professions in Nigeria (Atilola, 1999). The Nigerian Surveyor was among the first professional man to be exposed to formal training locally. The first Survey School in Nigeria was established in 1908 as a Departmental post-secondary school, to cater for the education of the country's youth who could not proceed overseas for further training. That school was later moved to Ibadan in 1927, from where it finally moved to Oyo in 1935. When the Yaba College of Technology was established around 1932 as the highest institution in Nigeria, a provision was made for prospective surveyors to undergo basic educational studies in the institution for two years, followed by two years of training

at the Survey School, Oyo. Successful candidates were subsequently awarded diploma of the College. The first exposure to university education came in 1947 with the establishment of the University College of Ibadan. There, provision was made for the training of professional surveyors for the country. The programme was later discontinued following a change in the policy of the colonial administration (Fajemirokun, 2008).

In 1962, the Nigerian College of Technology, Enugu became part of the then two year old University of Nigeria, Nsukka and the Nigerian Surveyor was again exposed to university education. The first set of 5 students of surveying from the University graduated in 1966, 58 years after the first Survey school was opened in Lagos (Fajemirokun, 1976).

In 1970, the University of Lagos (UNILAG) also began the training of Surveyors by establishing a Sub-Department of Surveying in her Department of Civil Engineering. The Sub-Department became a full fledged department in 1973. The initial programme of the sub-department at the time was a two-year postgraduate course of studies and research leading to the M.Sc. (Surveying) degree. Graduates in fields cognate to surveying were admitted into the programme (Department of Surveying and Geoinformatics Unilag, 1999). Prior to all these, the Faculty of Engineering of the University of Lagos in 1967 arranged for a few students who were surveying undergraduates of the University of Nigeria, Enugu Campus and who were displaced by the Civil War, to complete their degree programmes in the Faculty, and earn a degree of the University. About the time survey training started in Lagos, another Department of Surveying was established at the Ahmadu Bello University in Zaria, in the northern part of the country. All these three departments were domiciled in the Faculty of Engineering at the time of their establishments.

At the beginning of the 1974/75 session, the first set of five students was admitted to Unilag to pursue a three year B.Sc. programme in Surveying, after obtaining A' Level papers in relevant courses or having completed a one year preliminary programme in Engineering in the Faculty of Science. In addition, a postgraduate diploma programme for graduates with relevant degrees was introduced (Department of Surveying Unilag, 1981). The three-year undergraduate programme was later changed to a four-year programme to allow for enough practical experience before graduating. Presently, the Department runs a five-year undergraduate programme.

University training in surveying in Nigeria is also offered at the Enugu State University, Enugu, Federal University of Technology Minna, Rivers State University of Science and Technology Port-Harcourt, Abubakar Tafawa Balewa University Bauchi, Imo State University Owerri, University of Uyo Uyo, Nnamdi Azikiwe University, Awka, and the Federal University of Technology Yola.

The duration of university training programme in Nigeria is five years for candidates entering

through the University Matriculation Examination (UME), four years for candidates entering with National Diploma certificate (ND) and three years for holders of Higher National Diploma Certificate (HND). Postgraduate programmes in Surveying and Geoinformatics at M.Sc. and Ph.D. levels also exist in a few of these Universities.

The minimum entry requirement for Surveying and Geoinformatics courses in Nigerian Polytechnics is four credits (in W.A.E.C and NECO) at not more than two sittings in Mathematics, Physics, English, and Chemistry or Geography. Candidates are also required to sit and get above the cut-off marks in the Polytechnic JAMB Examination.

At the university level the minimum entry requirement is five credits at not more than two sittings in Mathematics, Physics, English, Chemistry or Geography and one other subject. The minimum entry requirement in University of Lagos for Surveying and Geoinformatics is five credits in Further Mathematics, Mathematics, Physics, English, Chemistry or Geography at one sitting.

Candidates seeking University admission are required to sit and pass the JAMB examination and the Post JAMB test. The JAMB and Post JAMB test subjects for Surveying and Geoinformatics are Mathematics, Physics, English, Chemistry or Geography.

2. Dearth of Qualified Candidates for Surveying and Geoinformatics Programme

One common and major problem faced by all the Universities is in recruiting qualified and interested candidates in adequate numbers as students. This problem is aggravated by the large number of Universities struggling to recruit from the limited number of available qualified candidates. While the number of Universities offering Surveying increased from one in 1962 to three in 1970, the position remained the same till the mid '80s. Within the next 15 years, the number had increased to eleven. Table 2.1 shows Surveying and Geoinformatics students' enrolment statistics at the University of Lagos between 1998 and 2009.

S/N	Session	No of UME Applicants	No of UME Admitted		No of DE Applicants	No of DE Admitted		No of Applicants for Change of Course
			Merit	Supplementary		Merit	Supplementary	
1	1998/1999	*na	26	105		10		
2	1999/2000	64	28	27		13		
3	2000/2001	*na	11	65	23	25		
4	2001/2002	*na	14	147		44		301
5	2002/2003	*na	28	27		20	30	54
6	2003/2004	42	23	*na		28	1	
7	2004/2005							
8	2005/2006	52	39	17	62+	32		
9	2006/2007	36	13	45		18	2	102
10	2007/2008	36	19	23	16+	7		
11	2008/2009	59	26	2	15+	9		

*na — not available

Table 2.1: Students Enrolment Statistics in University of Lagos Between 1998 and 2009

From table 2.1, most of the candidates coming into the department through the University Matriculation Examination (UME) are mostly through supplementary admission, which picks from candidates crossing from other departments because they could not be admitted for their first choice courses. The situation is different in the current session, as almost all admitted students were on merit. It is hoped this trend will continue.

Most of the candidates coming in through direct entry (into year two and three) got admitted by merit. This is the case because many candidates with National Diploma (ND) and Higher National Diploma from polytechnics were able to come in between 1998 and 2002. However, when the entry qualification was changed from Upper Credit to Distinction in 2003, many of them could no longer come in. Most of the candidates coming into the department through direct entry at present are candidates from the University Diploma programme.

From table 2.1, it is clear that we have candidates enrolment problem into Surveying and Geoinformatics programme. Many factors are responsible for the dearth of qualified and

available candidates for recruitment into the Surveying and Geoinformatics programmes in Nigerian's Universities, these factors include:

- i. Very low regard and poor publicity for the Profession of Surveying in the country.
- ii. The centralized process of admission of students into the various University programmes.
- iii. The perception of poor career prospects for graduates in Surveying.
- iv. The physically demanding (and sometimes dangerous) nature of the practical aspects of the training of Surveyors
- v. Poor financial yield for qualified professionals in Surveying in comparison to others
- vi. The stringent entry requirements into the course, which is the same for other courses within the Faculty of domicile, while some of these courses are considered 'better' than surveying
- vii. Perception of students that surveying as a course is not only difficult, but also boring.

2.1 Very Low Regard and Poor Publicity for the Profession of Surveying in the Country

The poor enrolment rate in the profession of surveying can be largely attributed to the low regard people have for the profession. Majority of the public erroneously think that all surveyors do is to carry poles and theodolites, and enter the bush to demarcate landed properties. Many young school leavers want courses or professions like engineering, law and medicine that will make them popular and give high financial yields. We live in a community where people worship titles and like to be called doctors, lawyers or engineers. This low regard for the profession is however changing as more people get enlightened. The impact of recent advances in Information Technology, coupled with the emergence of GIS, has made many enlightened people to know the power of GIS and surveying in managing spatial data.

Poor publicity for the profession has also contributed to the enrolment problem. For instance, ethics of the profession as practiced in the country does not permit self advertisements. As a body, the profession also shies away from aggressive publicity of its activities and capabilities. It is also our opinion that established professionals have also not done enough to attract and encourage young ones, through personal contacts, print and electronic media to join the profession. It is however interesting to note that some of our professional colleagues have succeeded in getting their children to join the profession. Many of them did this because of the wealth that the profession has brought to them, while others did so because of the love they have for the profession.

2.2 The Centralized Process of Admission of Students Into the Various University Programmes

Admission of students into university programmes in Nigeria is through the Joint Admissions and Matriculation Board (JAMB). JAMB stipulates the minimum entry requirements into all university programmes. For the University of Lagos, candidates are expected to score at least 200 out of 400 in the JAMB exams before they could be given any consideration into any degree programme. In addition, the cut off marks are usually high because of the large number of candidates seeking admission into the university. The JAMB examination is written at the same time by all the candidates; because of this, candidates usually

prefer to choose popular courses, to the detriment of the other ones like Surveying. The eleven universities offering surveying and geoinformatics programmes are left to struggle to attract the very few school leavers, who are genuinely interested in the course, and who have applied to JAMB for the course.

Within the university, admission is handled on faculty basis. Invariably, there is uniformity in admission requirements within the faculty, and this works to the detriment of the less popular courses like surveying. The department, often times, is forced to make do with candidates who were unable to get admission into their first choice course. The problems associated with the centralized process of admission have made enrolment into surveying programmes difficult.

2.3 The Perception of Poor Career Prospects for Graduates in Surveying

There is a general belief by the general public in Nigeria that there are little or no career prospects for graduates in the surveying programme in the country. Many people still see surveyors as people who work only in the bush. This impression is however changing slowly, due to education and public enlightenment.

2.4 The Physically Demanding Nature of the Practical Aspects of the Training of Surveyors

One of the reasons for the low enrolment of candidates into surveying and Geoinformatics programmes is the fact that some aspects of work in the profession is physically demanding. Though with modern instrumentation like GPS and remote sensing, the physically demanding part has been reduced, people still have the old mentality of surveyors always carrying poles and traditional instruments about in the bush. In any case, the physical nature of aspects of the surveyors' work cannot be totally eliminated.

2.5 Poor Financial Yield for Qualified Professionals in Surveying in Comparison to Other Professions

The poor financial yield in the profession as compared with some other professions where charges are based on percentage of the cost of project has discouraged quite a number of intending entrants. Despite the fact that efforts are made by the profession to see that surveyors are adequately remunerated, we still have a lot to contend with in this regard. Most survey projects

are not given directly to members of the profession, but are awarded to Engineers, Architects and even lawyers, who only give the survey components of the job out to surveyors at ridiculous fees.

2.6 The Stringent Entry Requirements into the Course

The stringent entry requirement in some universities and especially University of Lagos has discouraged many candidates from seeking admission into Surveying and Geoinformatics. University of Lagos demands that all candidates must pass all the required subjects in the Ordinary School Certificate level at one sitting for all courses in the university. In addition, Faculty of Engineering, where the Department of Surveying and Geoinformatics is domiciled, also requires a credit pass in further mathematics for any degree programme in the Faculty. The Faculty also requires distinction from candidates with polytechnic diplomas for direct entry admission. The situation in the past used to be Upper Credit for candidates coming in through the polytechnics. Since most of the candidates seeking admission into the department through direct entry have upper credit, they are therefore unqualified for admission.

2.7 Perception of the Students that Surveying is Difficult and Boring

Many students in the profession believe that surveying as a course is not only difficult, but also boring. Most of those complaining are those who are ill advised to choose the course instead of some other courses that are not so much mathematically oriented. Also, some students admitted after effecting a change of course, or during supplementary admission, find it difficult to move along with other students in the class.

3. Measures taken to solve Students' Enrolment Problem

The following steps have been taken by the Department of Surveying and Geoinformatics, UNILAG to encourage students' enrolment into the department:

- Organising career talks in Secondary Schools
- Reviewing admission requirements, and making it more relevant to the course
- Encouraging and engineering more, and positive publicity for the profession

- Reviewing the curricula, to make the course more interesting and attractive to young school leavers.

3.1 Career Talks and Positive Publicity

Public campaign to get qualified candidates into the profession has been stepped up in recent times. Career talks have been given to secondary school students. The 'GIS Day', a day set apart to popularize GIS, has also been exploited to give career talks and sensitize candidates on the profession. Secondary school students are being invited to the department to see some of the facilities, and also get acquainted with what they stand to gain by joining the profession. The department of Surveying and Geoinformatics, Unilag, has used some of the public enlightenment campaign and career talks to identify areas of job opportunities for graduates in Surveying and Geoinformatics. The department also publishes, regularly, students' prospectus for undergraduate and graduate programmes. The prospectuses, among other things, list several job opportunities that await graduates of this profession. Some of the places where graduates of this profession could be employed in the country include, but are not limited to:

1. Telecommunication Industry like MTN, ZAIN, GLO MOBILE and, STARCOMMS
2. Military (i.e. Nigerian Army, Navy, Airforce and Police)
3. Oil Companies (i.e. Shell, NNPC, Exxon-Mobil, Chevron, Department of Petroleum Research (DPR))
4. National Space Research and Development Agency (NASRDA)
5. Federal Airport Authority of Nigeria (FAAN), Nigerian Airways Management Authority (NAMA)
6. Federal and State Survey Departments
7. Federal and State Universities and Polytechnics
8. Federal and State Ministry of Solid Minerals
9. Federal and State Ministry of Water Works
10. Federal Capital Development Authority (FCDA) Abuja
11. Banks and Insurance Companies
12. Institutes of Agriculture and Forestry
13. Nigerian Ports Authority (NPA)

14. National Institute of Marine and Oceanography Research Department (NIOMR)
15. Nigerian Institute of Waterways Authority (NIWA)
16. Federal and State Environmental Protection Agencies
17. Dredging Companies like Dredging International
18. Engineering Construction Firms (i.e. Julius Berger)
19. Survey and GIS Companies and organisations
20. Personal Survey Practices.

The poor perception by the public concerning career prospects for graduates in the profession is fast changing because of the high rate of general unemployment in the country. People have now come to know that it is easier and more lucrative to own a private Surveying and Geoinformatics company than to build a hospital or set up an engineering firm. In addition, many of our graduates are working in telecommunication firms, oil companies, and federal and state government establishments.

The Lagos State government in July 2007, through the office of the Surveyor General, embarked on a public forum to sensitize the citizens on the benefit of the Lagos State Mapping project to the general public. Through this forum, which was chaired by the Deputy Governor of the State, many people including prospective students have come to know more about surveying and geoinformatics. The Nigerian Institution of Surveyors has also, in recent times, been aggressively promoting the publicity of the profession. The President and other officers take every opportunity that comes their way to publicize the profession and its valuable and key contributions to the society

Besides career talks and publicity, many efforts are being made to counsel students who find the course difficult and boring, and majority of them have come to love the course, especially as they get to higher levels where they are introduced to GIS and modern instrumentation in surveying.

3.2 Reviewing Admission Requirements

It is worthy to note that University of Lagos pioneered efforts to reduce some of the problems associated with the centralized admission by conducting post JAMB examination for candida-

tes who chose the university as their first choice and scored more than 200 in JAMB examination. This laudable step was initially rebuffed by JAMB, but as more universities aligned with University of Lagos' position, the post JAMB examination has come to stay and it is now being conducted by all the universities in Nigeria. The post JAMB examinations have succeeded in getting qualified candidates into the Nigerian universities.

The Department of Surveying and Geoinformatics, University of Lagos is also planning to move out of the Faculty of Engineering to the Faculty of Environmental Science, where the department actually belongs, and it is most likely that the admission requirements there will be more favourable to prospective students. These steps, when taken, will further improve students' enrolment into the department.

3.3 Curricula Review and Change of Name

In line with the development in Colleges of Education and Polytechnics, the National Universities Commission (NUC) directed all institutions offering surveying to modernise their curricula. Due to recent advances in Information Technology and its effect on the profession, the Department of Surveying and Geoinformatics, University of Lagos recently reviewed its various degree programmes and came out with new structures, whose curricula tended to address the shortcomings of the past (Fajemirokun and Nwilo, 2000). Some of the new courses introduced at the undergraduate level include Computer Applications in Surveying, Principles of Geoinformation, Digital Mapping, Coastal Mapping and Management and GIS Tools and Applications. At the Graduate level, some of the new courses introduced are Data Acquisition Systems, Advanced Concepts in Geoinformatics, Spatial Data Structures, GIS Implementation Strategies, Spatial Statistics, Policy Issues in GIS Implementation and Digital Cartography.

Advancement in technology coupled with the changing trends in the surveying profession led to a worldwide debate on the appropriate name for the profession. A number of training institutions and establishments after the debates changed their names. Some of the new names adopted include Geomatics, Surveying and Geoinformatics, and Geodesy and Geomatics Engineering. The global wind of change in name of the profession also blew across Nigeria.

The Department of Surveying and Geoinformatics, University of Lagos formerly known as the

Department of Surveying University of Lagos led the campaign for the change in name of the profession in Nigeria. The campaign for the change in name was cushioned with a workshop on Surveying and Spatial Information Technology in July 1999 organised by the Department. The objectives of the workshop were to determine the appropriate name and direction for the profession in the Department as well as in the country (Nwilo *et al*, 2000). Experts in the profession across the country from tertiary institutions, oil companies, government agencies and other key management leaders participated in the workshop. Papers were delivered by some of the experts in the profession. At the end of the workshop, the Department adopted the name "Surveying and Geoinformatics". The new name had since been approved by the University Authority.

The modernization of the curriculum and change in the name of the department has attracted more people into the profession. There are many graduate students from other fields coming to do professional Masters in Geoinformatics in the department. In recent times many of the former graduates have been coming back to do M.Sc. programme in the department. The department graduated two Ph.D. students in surveying and Geoinformatics this year, and has close to ten registered Ph.D. students presently.

3.4 Improved Financial Yield for Professionals

The Federal Government has taken some steps to correct this anomaly by moving the Office of the Surveyor General of the Federation (OSGoF) from the Ministry of Works to the Presidency. Notably, some State governments have recently awarded GIS and mapping projects directly to surveyors. These efforts by both Federal and State governments have rekindled hope in the profession.

4. Conclusion and Recommendation

4.1 Conclusion

Recruiting qualified and interested candidates into Surveying and Geoinformatics programme has been a huge problem. Many factors like the large number of Universities competing for limited number of candidates, poor publicity for the profession, centralized process of admission of students into the various University programmes coupled with stringent entry requirements into the course have contributed to the inability to recruit interested and qualified students into the programmes in adequate numbers.

The Department of Surveying and Geoinformatics, University of Lagos, had been concerned and has been in the forefront of the vanguard to solve the problem of the dearth of qualified candidates for the Surveying and Geoinformatics programme. The Department paid attention to the very narrow interpretation given to "surveying" by the general public, and the need to reflect the tremendous impact that the advances in technology and modern techniques have had on the profession of surveying. In 1998, the Department, in conformity with the reviewed programme changed its name from 'Department of Surveying' to the Department of Surveying and Geoinformatics, to portray a discipline that deals with acquisition, analysis, storage, distribution, management and application of spatially-referenced data.

Public campaign to get qualified candidates into the profession has been stepped up in recent times. Career talks have been made to secondary school students. The GIS Day has also been exploited to give career talks and sensitive candidates for the profession.

It is worth noting that University of Lagos pioneered efforts to reduce some of the problems associated with the centralized admission by conducting post JAMB examination for candidates who chose the university as their first choice and scored more than 200 in JAMB examination. The Department of Surveying and Geoinformatics, University of Lagos is also planning to move out of the Faculty of Engineering to the Faculty of Environmental Sciences, and to review the entry requirements for prospective students.

The efforts made at the University of Lagos have generated a lot of interests in the profession amongst students and prospective students. By the 2008/2009, the Department had been able to fill its admission quota with qualified candidates, almost exclusively from those who indicated Surveying and Geoinformatics as their first choice course, in the central admission system. There are also many graduates from other fields coming to do professional Masters in Geoinformatics in the department. In recent times many former graduates have been coming back for the M.Sc. programme in the department. The department also graduated two Ph.D. students in Surveying and Geoinformatics this year, and has close to ten registered Ph.D. students currently.

4.2 Recommendation

The following recommendations if carefully implemented will go a long way in attracting qualified candidates to join the Surveying and Geoinformatics profession.

1. More career talks and public enlightenment campaigns on surveying and geoinformatics should be made in secondary schools, electronic and print media.
2. The Federal and State governments should award survey projects directly to competent and qualified professionals in their respective fields.
3. All impediments like stringent admission requirements that are counter productive should be removed.
4. Surveying and Geoinformatics curricula should be reviewed and modified from time to time in line with advances in information technology and instrumentation.
5. The Nigerian Institution of Surveyors and the Surveyors' Council of Nigeria should work closely with professionals in Higher Institutions, Public Service and in private practice to modernize professional practice in Nigeria, and promote the well being of the profession.

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