6. The Suame Magazine

Henry A. Brown-Acquaye
University College of Education of Winneba, Winneba, Ghana

Introduction

When Ghana gained its independence in 1957 from the British colonial government, there was already a corps of highly educated Ghanaians in all disciplines, including science and engineering. The colonial government recognised the contribution that higher education could make towards the general well-being of the nation.

In 1945 the Asquith Commission on Higher Education reported:

The immediate objective is to produce men and women who have the standards of public service and capacity for leadership which progress of self-government demands, and to assist in satisfying the need for persons with professional qualifications required for economic and social development of the colonies.

The 'Elliot Report' presented to the British Parliament by the Secretary of State for the Colonies in June 1945 cleared the way for the establishment of the University College of the Gold Coast and later the College of Technology, Science and Arts at Kumasi.

Indeed, the fundamental political character underlying the British colonial government's policy for the provision of education had already been established. In 1882 an education ordinance was enacted and was to be applied generally to British West Africa. The education system was to be modelled on the English pattern.

Following all the expressed motives inherent in the colonial government's promotion of higher education, it came as no surprise that the motto chosen for the University of Science and Technology, the successor to the College of Technology, Science and Arts, was, translated literally into English: 'The knot of wisdom can be untied only by the wise'. The ordinance promulgating the legal existence of the College of Technology, Science and Arts was passed by the Gold Coast Government on 6 October 1951. The role of the university was to produce the personnel needed for the technological development of the country and, in doing so, to attempt to solve some of the difficult problems that confronted the country.

By the time the College of Technology, Science and Arts achieved full university status in 1961, it had a list of highly-qualified Ghanaian academic staff members, including the late Dr R.P. Baffour OBE, M.I. Mech.E., M.I.Nucs.E, F.R.A.S., who became the first Vice-Chancellor. There was also a large number of internationally respected foreigners on the academic staff.

During the period 1971–85, most developing countries such as Ghana experienced the disastrous effects of the global economic recession after the crude oil price hikes of the early 1970s. This serious economic situation caused social problems that led to mass migrations. Many highly-qualified personnel left the country for Europe, particularly the UK, USA and neighbouring West African countries, especially Nigeria, which was then experiencing an oil boom. University lecturers joined the mass exodus.

However, it did not look too easy for highly-qualified university engineering lecturers to find suitable jobs outside the country. Hence a number remained but the situation at home was so bad that they had to find other ways and means to supplement their income by establishing their own small-scale businesses. The functions and activities of the dormant Technology Consultancy Centre that had been established to offer consultancy services to industries were activated by these engineering lecturers who remained in Ghana. The situation compelled them to innovate in problem solving to sustain the informal sector, from which they made extra earnings.

The formal sector was collapsing. While other non-engineering lecturers who had remained in the country supplemented their incomes by becoming involved with commerce, engineering lecturers worked more and more closely with the informal sector, and students' dissertations were based on it.

Suame Magazine

In the early 1970s the Technology Consultancy Centre (TCC) of the then University of Science and Technology, now called Kwame Nkrumah University of Science and Technology (KNUST), introduced the concept of the Intermediate Technology Transfer, after interacting with the many artisans working in the informal industrial sector, particularly with those at Suame Magazine, located in the north-western suburbs of Kumasi, the second largest city in Ghana.

At that time Suame Magazine was an informal first-generation engineering industrial centre, concerned mostly with the needs of the motor vehicle. The artisans were mostly engaged in some aspects of the repair of road transport

vehicles such as general auto-fitting, engine overhauling, body straightening, vulcanising, auto-electrics, battery servicing and upholstery.

A survey conducted by the Department of Housing and Planning Research of the Faculty of Architecture, University of Science and Technology, in 1971 recorded a total population of 5485 artisans in the area. Of this number, 1615 were masters and 3870 were apprentices. The breakdown is given in Table 6.1.

Table 6.1. Composition of Artisans in Suame Magazine, Ghana in 1971

Number of Shops	1085
Number of Masters	1615
Number of Apprentices	3870
Total Population	5485
Shops by Trade	
General Fitters	287
Diesel Fitters	4
Land Rover Fitters	5
Tractor Fitters	4
Traders – General	101
General Spare Parts Dealers	99
Secondhand Spare Parts Dealers	16
Brand New Spare Parts Dealers	32
Secondhand Car Dealers	6
General Welding and Straightening	194
General Blacksmith	98
Block Machine Maker	1
General Electrical Works	48
Battery Charging	23
Lathe Turner	7
Spray painting	32
Printing Press	1
Carpenters	49
Tailoring	9
Car Lining	28
Vulcaniser	5
Others	566
Total	**1615**

In the same survey, the educational background of the masters was also established and is given in Table 6.2.

The artisans at Suame Magazine in those days were mostly engaged in the repair of imported machinery. However, there were some activities that bordered on innovative manufacturing processes such as the building and installation of new wood and steel bodies on old chassis. Examples of the innovative designs and products of the artisans at Suame Magazine included locally designed trailers used for agricultural tractors and the very popular pull-along trolleys with four car wheels found and used in Ghanaian markets to cart goods. These artisans also produced charcoal stoves using the steel sheeting of old car bodies. Later, products such as steel burglarproof screens and ornamental iron work gates were also produced at Suame Magazine.

A group of lecturers at the Faculty of Engineering of the University of Science and Technology, Kumasi, recognising the skills of these artisans at Suame Magazine, decided to assist them by forming the Suame Product Development Group. This was done to establish a link between the university and the local artisans in the informal industrial sector at Suame Magazine.

Table 6.2. Percentage of Masters having Education

Level of Education	Percentage
None	12
Primary	17
Middle School Leavers Certificate	42
City and Guilds Test	1
Private Trade Test	24
Other	4
Total	**100**

What kind of science has been promoted?

There are aspects of both indigenous science and modern technical practices at Suame Magazine. University authorities realised the important contribution the Suame Product Development Group was making towards the utilisation of research findings for the informal industrial sector and thus decided to integrate the group with the official (TCC). Through this integration the artisans at Suame Magazine gained access to the use of semi-automatic capstan lathes for the production of steel bolts and nuts of many different types. Initially there were different levels of operation. This was partly why, despite the attempt to attract and sustain the interest of the artisans in new production techniques to the extent of TCC establishing production and training units on the university campus, it was later realised that the proper location of the production and training units was the hub of the informal

industrial area and thus the concepts of the Intermediate Technology Transfer Unit (ITTU) came into focus. If the training had continued to be based at the university campus, the curriculum and qualifications of the candidates would probably have risen to a point whereby the original target audience would have been eliminated.

The non-engineering or secondary industries, such as agricultural and craft industries, provided many opportunities for the ITTU to introduce new equipment. The involvement of a Rural and Women's Industries Extension Officer (RAWIEO) ensured sustenance of the non-engineering industries. This officer identifies new opportunities for the local manufacture of tools and equipment and also organises training programmes to ensure their effective use. The RAWIEO concentrates on promoting employment opportunities for women, even encroaching on traditional male enterprises such as cloth weaving and engineering.

The peculiarities of each region are highlighted by the ITTU through the programmes of rural and women's industries, depending on their local natural resources and basic traditional skills. For example, rice, cotton and bullock farming have influenced the work programmes of Tamale ITTU in contrast to Kumasi ITTU. The fishing industry in the southern parts of Ghana is taken care of by the Cape Coast and Tema ITTUs.

It is thus evident that while the ITTUs all possess essentially the same range of engineering capabilities, there is a bias in their secondary manufacturing activities. The ITTUs work with people at the grassroots and share the same economic and social environments. By design the ITTU promotes grassroots industrial development by means of technology transfer to the small-scale and informal sectors, and by so doing the informal sector gains some of the advantages of the large-scale formal sector industries such as consultancy services, training and access to imported plant and machinery. Information, advice and training are three basic services provided free of charge by the ITTUs.

The ITTUs are self-financing in terms of recurrent expenditure. An important aspect of the ITTUs is that they are not technical training institutes in any formal sense. They do not train beginners but rather provide an in-service training programme for the informal sector. All trainees have some practical skills acquired from a master artisan or some theoretical knowledge acquired at a technical school or polytechnic. The training programmes of ITTUs are designed to enable the trainee to find self-employment later. Trainees are afforded a range of services to help them establish new and sustainable

enterprises and are also assisted to acquire the machinery and manufacturing equipment needed to establish their own workshop on cash and credit terms.

Who were the anticipated beneficiaries?

The Suame Magazine ITTU was formally commissioned on 23 February 1981. The success of the intervention by the university lecturers of the Faculty of Engineering in the early 1970s was demonstrated by the artisans who had received training at the Suame ITTU established by the Technology Consultancy Centre Clients Association in 1982 when they successfully mounted an exhibition of their products at the 'Ghana Can Make It' Exhibition held in October 1983.

The need to establish ITTUs in the other regions thus became apparent and in 1984 the Technology Consultancy Centre drew up plans for the establishment of ITTUs in all other regional capitals in the country and recommended the setting up of the Ghana Regional Appropriate Technology Industrial Service (GRATIS). This recommendation was accepted and in 1987 GRATIS was established and two new ITTUs were immediately commissioned at Tamale in the Northern Region and at Tema, the port city in the Greater Accra Region. These early commissions were possible because there were already existing facilities in those two towns. Further establishments were started from scratch. The European Community (EC) and the Canadian International Development Agency (CIDA) heavily supported the GRATIS project. All ten regions of Ghana now have ITTUs.

Owing to the success of the ITTUs in Ghana, GRATIS has now been converted into a non-profit making development organisation under the new name GRATIS Foundation. It is a company limited by guarantee with this mission statement: 'The corporate Mission of GRATIS Foundation is to support Ghana's vision to become a middle-level income country through the development of micro, small and medium enterprises'.

Following its positive results in the field of technological advance, the European Union (EU) in March 2000, at the request of the Ghana Government, agreed to give further financial support for the third phase of the GRATIS projects that will cover the enhancement of the development service programme at each ITTU, the restructuring and expansion of the technical apprentices training programme, and the establishment of a loan fund for GRATIS/ITTU registered clients and graduated apprentices.

The Intermediate Technology Transfer Unit (ITTU)

An ITTU is composed of a group of basic engineering workshops, physically placed in the centre of an informal industrial centre that offers:

- Metal machining
- Welding, steel fabrication and steel metal working
- Blacksmithing
- Ferrous and nonferrous metal casting
- Woodworking/pattern making.

Ideally, each section of the ITTU is designed to be a replica of an informal sector workshop. In each section a master is assisted by between four and six apprentices as is the case in the informal sector. Each section emphasises the promotion of new manufacturing activities in addition to offering repair services, and the ITTU searches for markets for the new products or services to ensure motivation. In a dynamic process the ITTU activities are passed over to the clients and as they become competent the ITTU continues to help them by identifying new products and manufacturing technology to meet future needs and market opportunities.

Can School Science Benefit from these Examples?

Schools can benefit from these examples in that a number of activities are not beyond the capabilities and capacities of schools as long as they select what to do based on the human, material and financial resources available to them. Some of the practices of artisans in their trade have many of the principles taught in standard technical schools and conventional schools that have technical subjects in their curriculum. There is the added advantage of enabling pupils to appreciate what can be done with limited resources and the many opportunities that exist.