

United Nations Conference on Trade and Development

8th GLOBAL COMMODITIES FORUM

23-24 April 2018, Geneva

Challenges in placing industrial engineering graduates in the cotton sector

By

Dr. Ildephonse Nibikora, Senior Lecturer, Head of Department of Textile and Ginning
Engineering, Busitema University

The views expressed are those of the author and do not necessarily reflect
the views of UNCTAD.

Challenges in placing industrial engineering graduates in the cotton sector

Dr. Ildephonse Nibikora, Senior Lecturer, Head of Department of Textile and Ginning Engineering, Busitema University

8th Global Commodities Forum
Building skills for sustainable development
Room XXVI, Palais des Nations
Geneva, Switzerland

4/26/2018

OUTLINE

- 1. Introduction**
- 2. Challenges of Graduates Students in Textiles and Ginning**
- 3. Short presentation of the Department of Textile and Ginning**
- 4. Presentation of the integrated training curriculum to a broader industrial Engineering**
- 5. Challenges and future plan**

1. Introduction

- ❖ Ginning and Textiles Graduates are responding to the skills requirement of Ginners and textiles producers but they are facing a big challenges to get permanent employment.
- ❖ After Training, they first work for one season of three months in the Ginning plant , then after they look for job in others sectors.
- ❖ How can we have an integrated multi-skill technical training programme grouping several processing activities?

- ❖ To help them , Busitema University revised the Programme to a broader Textile and Ginning and Industrial Engineering curriculum.
- ❖ It could increase the supply of trained technicians, while at the same time providing more attractive employment conditions for technicians & longer contract
- ❖ However, this multi skill training programme needs support of funding to meet all the requirements

2. Challenges of Graduates Students in Textiles and Ginning

- ❖ Lower number of students come for training (low production of raw materials)
- ❖ Lower rate of employment
- ❖ Lower pay (salary, income, wage)
- ❖ Short contract of employment (seasonal of 3months) in Ginning Industries
- ❖ Poor working conditions

- ❖ All production has its roots in technology, capital, material and labor
- ❖ Technology, capital and material are created by labor
- ❖ Labor is the root of all production

But

- ❖ How much do we pay them?
- ❖ How much wealth do they create?
- ❖ What motivates you in pursuing your future career? Job satisfaction or money

Principles of Supply and demand of labor

	Labor demand	Labor supply
Competitive market	workers are usually paid according to the value of what they produce.	people provide labor in exchange for wages
Quantity of Labor	The higher the price of labor, the smaller the quantity of labor demanded	The higher the wage, the larger the quantity of labor supplied: the higher the pay, the greater the number of people that will be attracted to the job
4/26/2018		8

Wages and Skills level

- ❖ Unskilled labor
- ❖ Semi-skilled labor
- ❖ Skilled labor
- ❖ Professional labor

Three reasons for employers to use short term workers

- ❖ Flexibility of staffing
- ❖ Reduction of costs
- ❖ Easy of dismissal

Staffing flexibility

- ❖ Due to the rapid innovativeness in science, increasing competitiveness, companies has established policies of flexibility and adaptation to economic changes in order to keep profits as high as they can
- ❖ When demand is high, the response is overtime

Reduction costs and ease of dismissal

- ❖ Key benefit for short term employees is the reduction of recruitment cost
- ❖ Short term workers are easy to dismiss but may be less productive due to their time spent in learning new tasks.

Impact of Textile and Clothing Industries (TCI) to The economic development

- ❖ TCI are majors contributor to incomes generation
- ❖ TCI are dominant source of exportation and foreign currency
- ❖ Employment in TCI are significant

3. Short presentation of the department of Textile and Ginning

Faculty of Engineering

Established in 2007

DEPARTMENTS

1. Department of Agricultural Mechanization and Irrigation Engineering
2. Department of Computer Engineering
3. Department of Textile and Ginning Engineering
4. Department of Agro-processing Engineering
5. Department of Water and Mining Engineering

Dep't of Textile and Ginning Engineering

The department was established in August 2009 (academic year 2009/2010).

VISION

A Centre of Excellence through Academic Research & Innovation in Ginning, Manufacturing & Textile Engineering.

MISSION

To Provide High Standard Training, Engage in Quality Research and Outreach for Sustainable Development

Academic Programmes

EXISTING PROGRAMMES

1. BSc. in Textile Engineering (Now **Polymer Textile and Industrial Engineering**) co-funded by the Government of Uganda and World Bank in 2008
2. Diploma in Ginning Engineering (Now **Ginning and Industrial Engineering**) co-funded by Government of Uganda and World Bank in 1998

PLANNED PROGRAMMES

1. MSc. in Materials Engineering
2. PhD in Materials Engineering
3. Short Courses

Textile Engineering Programme

Objective

To train the required human resource for the textile industry in Uganda in particular and the region in general.

Specific Objectives

To produce graduates capable of:

- ❖ Managing a textile industry.
- ❖ Designing textile processes and understanding textile manufacturing trends.
- ❖ Utilization of textile Materials for product innovation.
- ❖ Understanding linkages between properties and structure of textiles.

Ginning Engineering Programme

Objective

To train ginning technicians capable of solving the challenges facing the Uganda's cotton industry.

Specific Objectives

To produce graduates capable of:

- ❖ Designing ginning processes.
- ❖ Designing, construction and maintaining of ginning machinery.
- ❖ Maintaining of all aspects of industrial electrical engineering.

Industrial Training

- Southern Range Nyanza Textile
- Sigma Knitting
- UIRI
- TIC Plastics
- Africa Polysacks
- KARI
- Phenix
- Alpha Woolen
- BSFA – Sheema
- Fine Spinning
- Ginneries

Graduation Statistics

Program Year	GINNING	TEXTILE
2012-2013	1	19
2013-2014	8	17
2014-2015	7	15
2015-2016	8	18
TOTAL	24	69
Average	5	15

Human Resources

- Senior Lecturer – 2 (PhD)
- Lecturer – 6 (1 PhD; 5 PhD candidates; 1 MSc)
- Assistant Lecturer – 1
- Teaching Assistant – 1
- Chief Technician – 1
- Senior Technician – 1
- Technicians – 3

TOTAL - 15

Research and Publications

- 2009 to-date

Item	International	Regional (Africa)	National (Ugandan)	Total
Journal Manuscripts	38	1	-	39

Collaborations

1. Moi University, Kenya
2. Ivanovo State Textile Academy, Russia
3. Technical University of Liberec, Czech Rep.
4. Datajim Kadam Textile Engineering Institute (DKTE), India
5. Presidential Initiative for Banana Industrial Development (PIBID), Uganda
6. Donghua University , China

4. Presentation of the Integrated Training Curriculum to a broader Industrial Engineering

Framework for reviewing a course for its sustainability

- Identifying the learning objectives
- Make ethics and value explicit
- Identifying sustainability competencies
- Identifying learning outcomes, specific knowledge, understanding and skills and assessment procedures
- Decide on the best delivery methodology
- Promote the course
- Review and renew the course

Technician work activities

- ❖ Prepare and set up equipment for operations either manually or by programming settings
- ❖ Respond to sudden breakdowns during a production run
- ❖ Diagnose problem quickly and fix faults on workplace
- ❖ Re-assemble and test machinery to make sure it is safe to go back into production

- ❖ Carry out planned maintenance for example checking circuitry
- ❖ Clean, oil and grease machinery
- ❖ Record work in detail and inform shift managers of progress or problems

Training and Development

- ❖ Machine operations
- ❖ Healthy and safety
- ❖ Company procedures
- ❖ Quality training
- ❖ Computer training

Skills, interests and qualities

- ❖ High level of technical knowledge and strong practical skills
- ❖ Good problem-solving skills
- ❖ Ability to work alone and as part of team
- ❖ Ability to follow set procedures
- ❖ Computer skills
- ❖ Good communication skills
- ❖ Sound knowledge of healthy and safety regulations

Competencies for learners

- ❖ Technical Knowledge
- ❖ Skills
- ❖ Values and attitudes

Competencies for learners

- ❖ Appropriate **knowledge** and understanding provide fundamental opportunities for **skill development** and sharing of **values and attitudes** while **values and attitudes** enable skills to be successfully deployed with the knowledge context.

Core competencies

- **Envisioning**: be able to imagine better future
- **Critical thinking and reflection**: ability to participate in change
- **Systematic thinking**: manage complex situations
- **Build partnership**: learn to work together, communicate and exchange information
- **Participation in decision making**: to empower individuals to take action.

Diploma in Ginning and Industrial Engineering (DGI) Curriculum

DGI

S/N	Code	Name	Hours
1	DGI 1101	Engineering Mathematics I	45
2	DGI 1102	Engineering Mechanical Science I	45
3	DGI 1103	Engineering drawing I	45
4	DGI 1104	Electrical Engineering Science I	45
5	DGI 1105	Communication Skills	45
6	DGI 1106	Computer Application	45
7	DGI 1107	Production Technology	60

DGI

S/N	Code	Name	Hours
1	DGI 1201	Engineering Mathematics II	45
2	DGI 1202	Workshop Technology	45
3	DGI 1203	Engineering drawing II	45
4	DGI 1204	Electrical Engineering Science II	45
5	DGI 1205	Engineering Mechanical Science II	45
6	DGI 1206	Power production	45
7	DGI 1207	Automobile Engines	60

DGI

S/N	Code	Name	Hours
1	DGI 2101	Industrial and Ginning machinery I	45
2	DGI 2102	Industrial Electrical Engineering I	45
3	DGI 2103	Materials Handling Equipment structures I	45
4	DGI 2104	Baling and industrial packaging	45
5	DGI 2105	Occupation Healthy and Safety	45
6	DGI 2106	Cotton production technology and marketing	45
7	DGI 2107	Industrial training	60

DGI

S/N	Code	Name	Hours
1	DGI 2201	Industrial Electrical Engineering II	45
2	DGI 2202	Industrial and Ginning machinery II	45
3	DGI 2203	Materials Handling Equipment structures II	45
4	DGI 2204	Industrial organization and management	45
5	DGI 2205	Entrepreneurship	45
6	DGI 2206	Fibre technology	45
7	DGI 2207	Organic Chemistry	60

Bachelor of Science in Polymer Textile and Industrial Engineering (PTI) Curriculum

PTI

S/N	Code	Name	Hours
1	PTI 1101	Engineering Mathematics I	45
2	PTI 1102	Computer Applications	45
3	PTI 1103	Organic Chemistry	45
4	PTI 1104	Engineering drawing	45
5	PTI 1105	Communication skills	45
6	PTI 1106	Engineering mechanics I	45

PTI

S/N	Code	Name	Hours
1	PTI 1201	Engineering Mathematics II	45
2	PTI 1202	Electrical Technology	45
3	PTI 1203	Production Technology	45
4	PTI 1204	Engineering Mechanics II	45
5	PTI 1205	Fibre Science Technology	45
6	PTI 1206	Fluid Mechanics	45
7	PTI 1207	Industrial Training	10 weeks

PTI

S/N	Code	Name	Hours
1	PTI 2101	Engineering Mathematics III	45
2	PTI 2102	Electrical Machines and Devices	45
3	PTI 2103	Computer Programming	45
4	PTI 2104	Polymer Chemistry	45
5	PTI 2105	Spinning Methods and Yarn Production	45
6	PTI 2106	Materials Science and Engineering	45

PTI

S/N	Code	Name	Hours
1	PTI 2201	Electronics Devices	45
2	PTI 2202	Polymer Science and Engineering	45
3	PTI 2203	Thermodynamic	45
4	PTI 2204	Mechanics of Materials	45
5	PTI 2205	Weaving Technology	45
6	PTI 2206	Heat and Mass Transfer	45
7	PTI 2207	Industrial Training	10 weeks

PTI

S/N	Code	Name	Hours
1	PTI 3101	Production Planning and Control	45
2	PTI 3102	Polymer processing	45
3	PTI 3103	Knitting Technology	45
4	PTI 3104	Gender studies	45
5	PTI 3105	Design of machine elements	45
6	PTI 3106	Research Method	45
7	PTI 3107	Theory of Textiles Structures	45

PTI

S/N	Code	Name	Hours
1	PTI 3201	Product Design and Development	45
2	PTI 3202	Nonwoven and Paper Technology	45
3	PTI 3203	Textile Wet-Processing	45
4	PTI 3204	CAD/CAE	45
5	PTI 3205	Control systems and Instrumentation	45
6	PTI 3206	Entrepreneurship	45
7	PTI 3207	Soft Computing and simulation	45
8	PTI 3208	Industrial Training	

PTI

S/N	Code	Name	Hours
1	PTI 4101	Industrial Textiles	45
2	PTI 4102	Business Management	45
3	PTI 4103	Maintenance Engineering	45
4	PTI 4104	Operations Research	45
5	PTI 4105	Quality Control and Assurance	45
6	PTI 4106	Leather and Footwear technology	45
7	PTI 4107	Woven Textile Design	45
8	PTI 4108	Final Year Project	

PTI

S/N	Code	Name	Hours
1	PTI 4201	Energy Conservation and Management	45
2	PTI 4202	Engineering ethics	45
3	PTI 4203	Environmental Health and Safety	45
4	PTI 4204	Engineering Economics and Financial Accounting	45
5	PTI 4205	Human Factor Engineering	45
6	PTI 4206	Project Planning and management	45
7	PTI 4207	Final Year Project	

Key messages

- i. Knowledge , technical skills, values and attitudes work together for career growth.
- ii. Busitema University has developed a curriculum to train students on a sequence of processing activities within the cotton as example of agricultural value chain that can be used as an effective multi-skill technical training program.
- iii. Policy makers have to protect labor to ensure minimum wage for different categories of labor.

iv. The main challenges Busitema University is facing in running a multi-training program are:

- a) Capacity building of staff
- b) Funds to organize practical skills (study trips) and maintenance of machines
- c) infrastructures and tools for demonstration
- d) Other facilities