

Quality of TVET in Rwanda with respect to gender and enrolment factors of access and equal opportunity in Ecole Technique Officiels (ETOs) and Agroveternaires (EAVEs)

Paul Mwangi Maringa† & Maina Maringa‡

Workforce Development Authority, Kigali, Rwanda†

Technical University of Kenya, Nairobi, Kenya‡

ABSTRACT: While rolling out the national Technical and Vocational Education Training (TVET) reform, there is justified concern about ensuring the quality of the new TVET offerings, with a natural focus on making up for prevalent shortfalls in access and equity. This concern is driven by an overarching need to avail everyone with an opportunity for a livelihood. Ecole Technique Officiels (ETOs) and Agroveternaires (EAVs) were purposively selected and respondents identified using judgemental sampling and that was complemented with complex (simple random, cluster and stratified) sampling. Well-structured coded survey instruments were used to guide enumerators through focused and group interviews of identified respondents. Data obtained were subjected to both descriptive and inferential statistical analysis. This helped release the desired qualitative and quantitative measures of the existing TVET. From the results, it was observed that the TVET offer lacks equity with regard to gender and enrolment levels. This is a challenge to the quality of TVET in the country that will need protracted and well guided efforts to be resolved.

Keywords: TVET quality, performance indicators, access, equal opportunity, gender

INTRODUCTION

Arising out of a history of challenged internal social management and the eventual civil war of 1994, this small country in the heart of Africa was typified by an incredibly slow pace of development for almost 30 years. The main stay of the economy then was agriculture and it is this same sector that displayed comparatively dismal performance with a growth rate in the 1980s and 1990s that varied in between -0.4% and 0.5% [1]. In three out of the five years of civil war, the economy was characterised by a continuous contraction of the GDP, with an incredible contraction of more than 40% in 1994 [2].

Protracted spells of strategic planning and results based management after the war and, especially, after the year 2000, guided as they were (and continue to be) by Vision 2020 [3] and the Economic Development and Poverty Reduction Strategy I (EDPRS I) [4], have turned around this lacklustre scenario. The results of these positive policies are seen in the progressively rising economic growth and associated social transformation. Rwanda has come to know a sustained post-war increase in its GDP, ranging from 9% in 1995 to 3% and 9% in 2002+ [2]. This has earned Rwanda the enviable reputation of being one of the fastest growing economies in the world. Efforts to stabilise its population are bearing fruit and poverty is on the decline.

The nation is unquestionably headed towards achieving the set Millennium Development Goals. The ideal of being a middle income economy by the year 2020 no longer appears like a lofty ambition. Government clearly recognises the interdependency between human resource capacity development and productivity. As such, much investment has been made in Technical and Vocational Education Training (TVET). A lot of policy development has been under way. The national TVET policy [5] was approved by government in the year 2008 alongside the concept of an integrated TVET system [6]. The principal thrust of these two policies is a fast tracked, orderly and market responsive, quality TVET reform that anchors the expectations of Vision 2020 for skilled human resource in the country [3][4].

The on-going TVET reform in the country is taking up considerable public resources. TVET is a hands-on product based form of training that seeks to expose trainees to as close a replica to the real world of work and its inherent processes as possible. Much investment is, therefore, needed to develop market relevant training standards from training and assessment packages to training of trainer systems, industrial attachment practice, school management systems and infrastructure. The later building block of TVET brings together well standardised training workshops, training equipment and training materials. Assembling these training standards in a manner that meets the demands of industry and expectations

of society for competitive graduates takes much investment. It has become clear to the nation that quality needs to be designed into the system during its formation rather than be hijacked into the system after expensive mistakes of graduating non-employable trainees, who lack relevant work-ready competencies, are released into the market.

Such a TVET system is becoming increasingly attractive in the country with a great majority of primary and secondary school leavers desirous of developing a sustainable livelihood through training in it. The likely marginalisation of the female child in a field that has erstwhile been perceived as the forte for male children is a real possibility that as an indicator of TVET quality needs to be managed sooner rather than later.

Engineer Moustafa Wahba's postulations on priority TVET quality indicators positioned this concern for gender equity in TVET right at the top of his ranking, within the access (and equity) factor of the fitness for purpose of the TVET quality indicator [7]. In his treatise of quality for TVET systems, he selected and ranked the seven indicators as follows:

1. Fitness to purpose of the TVET system. According to engineer Moustafa, the aim and objective of the TVET strategy is to create a TVET system that is: effective, efficient, relevant, flexible, modular responsive, accessible, affordable, accountable, sustainable and, which fulfills its general obligations towards the society;
2. Cost effectiveness that addresses inevitable budgetary constraints of an otherwise expensive training offer;
3. TVET courses/curriculum and training programmes that influence the processes of TVET system modernisation, transformation and adaptation to change; especially, with regard to their planning, development, content, quality and availability;
4. Infrastructure and training equipment where quality is accorded premium, in the sense of these facilities being well maintained and kept in order and operational, with outdated facilities, equipment, machinery and systems being upgraded appropriately;
5. Training plans, where it is recognised that the development and execution of a well-organised training plan is a cornerstone upon which a successful TVET system and the inevitable reforms, as it adapts to dynamically changing societal and industry needs, rests. Training plans and methodologies expectedly updated each year in the corporate plan alongside the procedural cyclic evaluation of training delivery methods;
6. Assessment, verification and accreditation processes that ensure that workers or trainees are well trained, assessed, verified and proven to be competent to the extent that they can effectively perform all tasks assigned to them against well identified competency standards levels;
7. Quality and competency of instructors/trainers that are competent in themselves to not only instruct, but practice in their respective fields of specialisation. Such trainers are able to confidently drive the training offer towards the status of being competency-based and demand-driven, while retaining local relevance and cultural suitability.

ACCESS TO AND EQUITY OF RWANDAN TVET

Descriptive analysis of selected internal and external factors of the social economic profiles of Ecole Technique Officiels (ETOS) and Ecole Agroveterinaires (EAVEs) in Rwanda is undertaken below. This analysis covers a requisite six of 10 aspects of society that include: female student population, male student population, female academic staff population, male academic staff population, overall student population and overall academic staff population aspects of access and equity. The additional four that embrace age, ownership, specialisation, location have been addressed and can be referenced as published [8].

Female Student Population

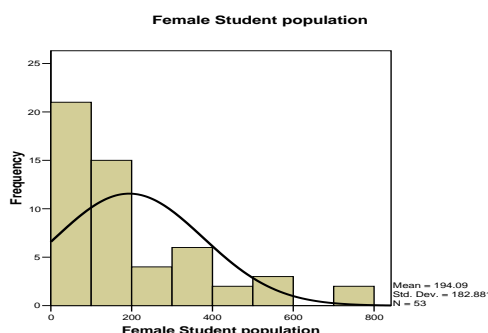


Figure 1: Population of female trainees in TVET schools.

A reasonable majority of the schools, 40.4% had female populations that were below 100 trainees. A smaller number of schools, 28.8% had a population of between 100 and 200 trainees. Cumulatively, schools with below 200 trainees accounted for a considerable 68.2% of the stock of schools. Interventions that seek to benefit female students should, therefore, preferably be directed to these schools.

Table 1: Population of female trainees in TVET schools.

Numbers of female students	Frequency	Percent	Valid percent	Cumulative percent
Valid	7	2	3.5	3.8
	9	3	5.3	5.7
	26	3	5.3	5.7
	38	3	5.3	5.7
	41	3	5.3	5.7
	49	2	3.5	3.8
	50	2	3.5	3.8
	71	3	5.3	5.7
	124	3	5.3	5.7
	135	3	5.3	5.7
	166	3	5.3	5.7
	197	3	5.3	5.7
	198	3	5.3	5.7
	212	1	1.8	1.9
	276	3	5.3	5.7
	315	3	5.3	5.7
	395	3	5.3	5.7
	468	2	3.5	3.8
	502	3	5.3	5.7
	724	2	3.5	3.8
	Total	53	93.0	100.0
Missing	System	4	7.0	
Total			57	100.0

There were 7.7% of schools with a female student population of between 200 and 300. An equally small proportion of schools had a female trainee population of between 300 and 400 (11.5%), 400 and 500 (3.8%), 500 and 600 (5.8%), and 700 and 800 (3.8%). The female student population distribution was evenly spread from small numbers to large numbers across the schools up from 7 trainees in a school to 724. The sampled schools had a total female student population of 4,003, which averaged 200 female students per school.

Male Student Population

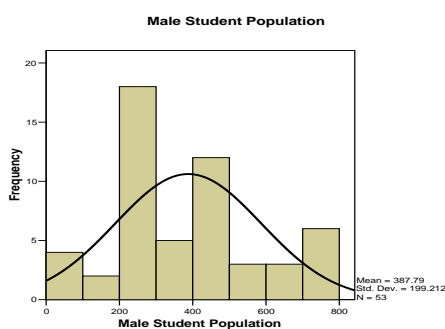


Figure 2: Population of male trainees in TVET schools.

Male student population was evenly distributed across the schools in proportions of 3.8%, 5.3% or 5.7% of the schools for population levels ranging from 15 trainees to 794. A population level of 289 male trainees was observed in a majority of the schools (11.3%), while a population level of 449 male trainees featured in only 1.8% of the schools, all surveyed here.

The great majority of schools had male student populations falling in between 200 and 300 (44.4%), 400 and 500 (19.0%), and finally 700 and 800 (9.5%). These three brackets of male student population accounted for 72.9% of the overall school stock.

The overall proportion of schools with male student populations of below 500 trainees encompassed a considerable 77.4% of schools surveyed. Those with populations above 500 trainees accounted for the balance of 22.6% of the schools surveyed. The schools surveyed gave a total male student population of 7,204, which averaged to 379 male trainees per school.

Table 2: Population of male trainees in TVET schools.

Numbers of male students	Frequency	Percent	Valid percent	Cumulative percent
Valid	15	2	3.5	3.8
	88	2	3.5	3.8
	144	2	3.5	3.8
	212	3	5.3	5.7
	262	3	5.3	5.7
	268	3	5.3	5.7
	281	3	5.3	5.7
	289	6	10.5	11.3
	368	3	5.3	5.7
	381	2	3.5	3.8
	400	2	3.5	3.8
	411	3	5.3	5.7
	421	3	5.3	5.7
	449	1	1.8	1.9
	493	3	5.3	5.7
	509	3	5.3	5.7
	674	3	5.3	5.7
	745	3	5.3	5.7
	794	3	5.3	5.7
Total	53	93.0	100.0	
Missing	System	4	7.0	
Total		57	100.0	

Female Trainer Population

A majority of schools had 3, 6 and 10 female trainers, accounting respectively for 22.6%, 15.1% and 20.8% of the schools surveyed; which amounted to 58.5% of the schools. It can be said, then, that 58.9% of the schools averaged 6 female trainers. The rest of the schools had between 1, 2, 5, 7, 8 and 9 trainers in proportions that varied between 5.7% and 9.7%, totalling to the balance of 41.5%. This also averaged to 6 trainers per school in 41.5% of the cases. Assuming that an average school should have an optimum of 30 trainers, this is a small proportion allowing women a 20% representation, and is likely to impact on gender issues of both the female and male trainees.

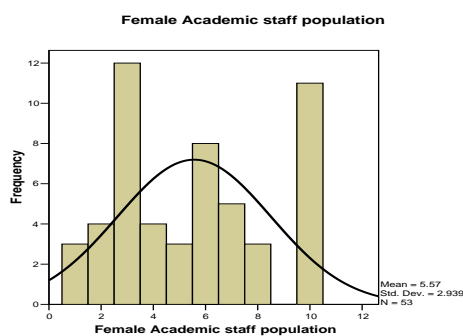


Figure 3: Population of female trainers in TVET schools.

Table 3: Population of female trainers in TVET schools.

Numbers of female trainers	Frequency	Percent	Valid percent	Cumulative percent
Valid	1	3	5.3	5.7
	2	4	7.0	7.5
	3	12	21.1	22.6
	4	4	7.0	7.5
	5	3	5.3	5.7
	6	8	14.0	15.1
	7	5	8.8	9.4
	8	3	5.3	5.7
	10	11	19.3	20.8
	Total	53	93.0	100.0
Missing	System	4	7.0	
Total		57	100.0	

Male Trainer Population

Table 4: Population of male trainers in TVET schools.

Numbers of male trainers	Frequency	Percent	Valid percent	Cumulative percent
Valid	9	2	3.5	3.8
	16	2	3.5	7.5
	17	2	3.5	11.3
	18	6	10.5	11.3
	19	6	10.5	34.0
	21	3	5.3	39.6
	23	7	12.3	52.8
	24	5	8.8	62.3
	25	6	10.5	73.6
	26	3	5.3	79.2
	30	5	8.8	88.7
	31	3	5.3	94.3
	40	3	5.3	100.0
Total	53	93.0	100.0	
Missing	System	4	7.0	
Total		57	100.0	

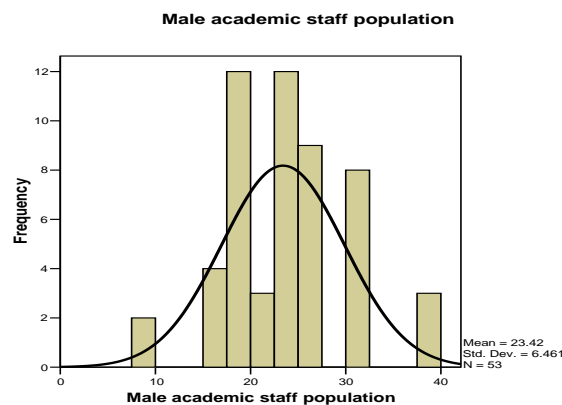


Figure 4: Population of male trainers in TVET schools.

A sizeable 47.1% of the schools had male academic staffing numbers of 18 (11.3%), 19 (11.3%), 23 (13.2%) and 25 (11.3%). This represents an average of 21 male trainers per school in 47.1% of the incidences. The rest of the 52.9% schools had staffing numbers that varied from 9 to 40 in a distribution of 3.8%, 5.7% and 9.4% by and large, with an average of 21 trainers in the schools. Assuming an optimum teacher population in schools of 30, this is about 67% of the staffing, and may have an effect on gender issues of male and female trainees.

Overall Student Population

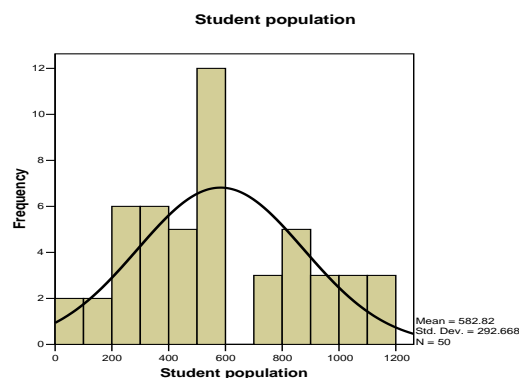


Figure 5: Overall distribution of student population in TVET schools.

Table 5: Overall distribution of student population in TVET schools.

Numbers of trainees	Frequency	Percent	Valid percent	Cumulative percent	
Valid	95	2	3.5	4.0	4.0
	198	2	3.5	4.0	8.0
	283	3	5.3	6.0	14.0
	290	3	5.3	6.0	20.0
	330	3	5.3	6.0	26.0
	386	3	5.3	6.0	32.0
	450	2	3.5	4.0	36.0
	455	3	5.3	6.0	42.0
	531	3	5.3	6.0	48.0
	535	3	5.3	6.0	54.0
	556	3	5.3	6.0	60.0
	565	3	5.3	6.0	66.0
	701	1	1.8	2.0	68.0
	739	2	3.5	4.0	72.0
	806	3	5.3	6.0	78.0
	849	2	3.5	4.0	82.0
	992	3	5.3	6.0	88.0
	1,021	3	5.3	6.0	94.0
1,176	3	5.3	6.0	100.0	
Total	50	87.7	100.0		
Missing	System	7	12.3		
Total			57	100.0	

Populations in schools varied between 95 and 1,176 trainees evenly in proportions of 4.0%, 6.0% of the schools surveyed. Curiously, there were no statistically detectable schools with populations of between 600 and 700. On the average, schools were seen to operate with 219 trainees. The independent surveys on female and male student populations revealed ratios of 35% females and 65% males per school, which would, then, translate to 77 female trainees to 142 males in any given school with an average of 6 women trainers and 21 male trainers.

The gender teaching ratio that may be derived here is 1 female teacher to 23 female trainees and 24 male trainees as compared to 1 male teacher to 4 female trainees and 7 males. If the preference in teaching for females is female trainers, then, they are undersupplied relative to the males, 3 times less, and this would have a matching impact on female trainee performance and possibly school enrolment as well.

Overall Trainer Population

Table 6: Overall population distribution of trainers in TVET schools.

Number of Trainers	Frequency	Percent	Valid percent	Cumulative percent	
Valid	11	2	3.5	4.1	4.1
	18	2	3.5	4.1	8.2
	22	3	5.3	6.1	14.3
	23	7	12.3	14.3	28.6
	24	6	10.5	12.2	40.8
	28	3	5.3	6.1	46.9
	31	3	5.3	6.1	53.1
	33	6	10.5	12.2	65.3
	35	3	5.3	6.1	71.4
	36	6	10.5	12.2	83.7
	40	2	3.5	4.1	87.8
	41	2	3.5	4.1	91.8
	47	1	1.8	2.0	93.9
	58	3	5.3	6.1	100.0
	Total	49	86.0	100.0	
Missing	System	8	14.0		
Total			57	100.0	

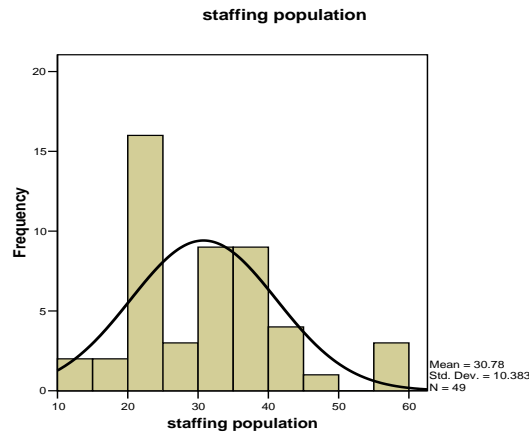


Figure 6: Overall population distribution of trainers in TVET schools.

FINDINGS

A conspicuous 50.9% of the schools had 23 (24.3%), 24 (12.2%), 33 (12.2%) and 36 (12.2%) academic staff, which amounted to 116 trainers. For the balance 49.1% of schools, 4.1% and 6.1% had staffing sizes of between 11 and 58 trainers. Both categories together averaged 29 trainers in a school, coming close to the optimum staff size of 30 earlier assumed, where 22% of the trainers were female and the remaining 78% male, serving schools where 35% of the trainees were females and 65% males. Proportionally, therefore, male trainees appear to suffer disadvantage if the goal was to have male trainees for male trainees. Assuming equal gender demand for places in schools for both trainers and trainees, and equal gender supply, it may alternatively be argued that female trainees and trainers suffered disadvantage.

In a reasonable majority of the schools, 40.4% had female populations that were below 100 female trainees. A smaller number of schools, 28.8% had a population of between 100 and 200 female trainees. Cumulatively, schools with below 200 female trainees accounted for a considerable 68.2% of the stock of schools. Interventions that seek to even out this imbalance, then, should preferably be directed to these schools. The female student population distribution was seen to be evenly spread from small numbers to large numbers across the schools, from 7 female trainees in a school to 724 female trainees in a school. The sampled schools gave a total female student population of 4003, which averaged to 200 students per school.

The male student population was evenly distributed across the schools in proportions of 3.8%, 5.3% or 5.7% of the schools for population levels ranging between 15 and 794 trainees. The great majority of schools had male student populations of between 200 and 300 (44.4%), 400 and 500 (19.0%) and, finally, 700 and 800 (9.5%), totalling to 72.9% of the overall school stock. The overall proportion of schools with male populations of below 500 trainees encompassed a considerable 77.4% of schools surveyed. Those with populations above 500 trainees accounted for the balance of 22.6% of the schools surveyed. The schools surveyed gave a total male student population of 7,204, which averaged to 379 male trainees.

The great majority of schools had 3, 6 and 10 women trainers, accounting respectively for 22.6%, 15.1%, and 20.8% of the schools surveyed, which amounted to 58.5% of the schools. This also averaged to 6 trainers per school in 41.5% of the cases. Assuming that an average school should have an optimum of 27 trainers, this was a small proportion allowing women a 22% representation, with a possible impact on gender issues of the female and male student trainees. A sizeable 47.1% of the schools had male academic staffing numbers of 18 (11.3%), 19 (11.3%), 23 (13.2%) and 25 (11.3%). This represented an academic staffing average population of 21 male trainers per school in 47.1% of the incidences. Assuming an optimum teacher population in schools of 27, this was about 78% of the staffing, and is expected to impact on gender issues of the male and female trainees.

Populations in schools varied between 95 and 1,176 trainees evenly in proportions of 4.0%, 6.0%, of the schools surveyed. Curiously, there were no statistically detectable schools with populations of between 600 and 700. On average, schools operated with 219 trainees. The independent surveys on female and male student populations revealed ratios of 35% females and 65% males in a school, which would, then, translate to 77 female trainees to 142 males in any given school with an average of 6 women trainers and 21 male trainers. The gender teaching ratio that may be derived here is 1 female teacher to 23 female trainees and 24 male trainees as compared to 1 male teacher to 4 female trainees and 7 males. Proportionally, therefore, if the preference in teaching was parity with respect to the teacher student ratio with respect to gender, male students would be taken to suffer disadvantage with respect to the proportion of male trainers available, and a statistically insignificant disadvantage with respect to the proportion of female trainers available. Given an eventual evening out of male female student ratios, then, unless this were to be matched with a corresponding increase in the numbers of female trainers, the situation would reverse itself this time disadvantaging the female students.

A good 50.9% of the schools had 23 (24.3%), 24 (12.2%), 33 (12.2%) and 36 (12.2%) academic staff members, which amounted to 116 trainers. For the balance 49.1% of schools, 4.1% and 6.1% had staffing sizes of between 11 and 58 trainers. Both averaged to 29 trainers per school, coming close to the optimum staff size of 30 earlier assumed, where then 22% was female and the remaining 78% male, serving schools where 35% of the trainees were females and 65% males. In this case, neither gender of trainers was underrepresented proportionally with respect to teacher student ratios, and instead the female trainees seemed to enjoy favour. Overall, schools were seen not to have achieved gender parity in male: female academic staff and student ratios.

CONCLUSIONS

Equity in terms of gender representation for both trainers and trainees was far from being achieved with female trainees on the average only approximating up to 50% of the male population and trainers lagging a poor about 30% of the male trainer population. The females seemed to enjoy favour with respect to gender based trainee: trainer ratios. In overall, TVET in Rwanda was seen to generally lack quality with respect to equal access for both genders.

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BIOGRAPHIES



Paul Mwangi Maringa (PhD) is an Associate Professor of Architecture and Planning. He has taught variously in diploma, degree, and graduate theory and portfolio courses in the department architecture at the Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Juja, Kenya, for 14 years; and also in the Department of Civil and Environmental Engineering at the Kigali Institute of Science and Technology (KIST), Kigali, Rwanda, for 2 years. His academic and professional career has seen him take up positions as Head of Department, Ag., Vice Rector and Ag., Rector, Editor-in-Chief, Associate Editor and referee for two, one and three peer reviewed academic journals respectively. He has also served variously as an Architect/Planner with the Nairobi Provincial office of the Ministry of Works, Githunguri and Collins International, and Ramani Consultants. He has considerable diverse consulting experience in TVET working as a technical expert and master trainer in

building construction, an infrastructural planning and development expert, an associate project team leader, and senior expert for planning and project management. He is a registered architect with the Board of Registration of Architects and Quantity Surveyors of Kenya (BORAQS), a corporate member of the Architectural Association of Kenya (AAK-Architects Chapter), a graduate member of the Architectural Association of Kenya (AAK-Town Planning Chapter) and a graduate member of the Kenya Institute of Planners (KIP). His professional and academic career, teaching in universities that spans the last 22 years has covered Kenya, the Kingdom of Swaziland and Rwanda. He pursues the growth of knowledge in the disciplines of architectural design and its behavioural underpinnings, urban growth management, sustainability, TVET management and reform.



Maina Maringa (PhD, CEng and MIMechE) is an Associate Professor of Mechanical Engineering with research specialisation in thermoelastic stress analysis, composite engineering materials and materials characterisation. He has lectured and undertaken research at tertiary level institutes and at universities for 17 years, while an academic member of staff in the Department of Mechanical Engineering at the Jomo Kenyatta University of Agriculture and Technology (JKUAT) in Juja, Kenya; in the Department of Mechanical Engineering of the Kigali Institute of Science and Technology (KIST), Kigali, Rwanda; and in the Department of Mechanical and Mechatronic Engineering of the Technical University of Kenya in Nairobi, Kenya. Maina served as the founding Vice-Principal initially in charge of Administration, Finance and Academics at the Integrated Polytechnic Regional Centre (IPRC) Kigali, in Kigali, Rwanda, and was the founding Acting Deputy Director General of

the Rwanda Workforce Development Authority. He has also served as the Head of the School of Engineering Science and Technology and is presently Acting Executive Dean of the Faculty of Engineering and the Built Environment, both within the Technical University of Kenya in Nairobi, Kenya. He has also worked as an operations and maintenance engineer cum manager in the hydro power generation sector in Kenya, following a one-year intensive training programme in thermal, geothermal, hydro and diesel power generation plants, electric power transmission distribution systems, system control and switchgear testing service, maintenance and repair. Maina serves as a Chief Editor, member of editorial board and referee for 16 journals internationally, and is a member and assessor of the Institute of Mechanical Engineers (UK).