EP04 - Education: Transforming Lives, Transforming Africa

00:00:06
Prof. Sam Yala
Centre President | AIMS Rwanda
We are not only there to train the students, but our vision is to transform the continent.

00:00:12
Alice Ikuzwe
Deputy Principal | Rwanda Polytechnique, Kigali College
Students should have that creativity. Not always tell them what to do and how to do it, but come up with the innovative way to do things.

00:00:22
Arlette Musanabera
Alumna | AIMS Rwanda
Some problems don't have quick solutions to them. Sometimes it takes time, and failure is often part of that process.

00:00:29
Hon. Paula Ingabire
Minister of ICT & Innovation | Rwanda
Innovation can only thrive if you have the right investments that you're putting in research and development.

00:00:35
Blaise Tchapnda
Academic Director AIMS Rwanda
I should make sure that there are some specific skills that I equip my learners with.

00:00:41
Dr. James Mworia
MD & CEO | CENTUM Investment Company
We need to carry every segment of our population, with us, and particularly those from underserved communities.

00:00:48
Dr. Peter Materu
Chief Program Officer | Mastercard Foundation
It's about access to finance, access to markets, access to inputs. If that enabling environment is not working well, the young person cannot succeed.
……

0:01:14

(VO)

Africa's greatest resource is growing in classrooms across the continent. Young minds learning to question, to create, and to build a generation of thinkers and builders ready to shape solutions their communities need most. As the world changes, their education will decide how far that potential can go.

0:01:38

Prof. Sam Yala
Centre President | AIMS Rwanda

The continent has the most valuable resource in terms of human resource, namely the youth of the continent. Almost one generation from now, four out of ten young men will be African. At the same time, there is kind of gap between that available resource, the African youth, and also the challenges and how to solve some of those challenges.

0:02:10

(VO)

To turn that promise into progress, education itself must evolve, awakening young minds to new ways of thinking and creating.

0:02:19

Alice Ikuzwe Deputy Principal | Rwanda Polytechnique, Kigali College

This time now they are dealing with AI. they are dealing with other innovative way of solving problems. So they have to adapt to what we have, but also try to cope with the situation we have currently.

0:02:32

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

The traditional approach to learning has been to teach the theory. But today we are in an age where things are happening very fast. Learners have to learn new things and learn new things, be able to learn on their own and be able to apply that learning to the solution of real problems. It has to be future focused. It has to think about What is going to be tomorrow like? And are we providing learners with skills that are relevant today and tomorrow? That differentiation is, it just, we have to think globally.

0:03:11

(VO)

Whether in classrooms or boardrooms, the same question lingers. Are we equipping young people for the world of today and the ones still changing around them?

0:03:21

Dr. Peter Materu Chief Program Officer | Mastercard Foundation

The STEM education is important because Africa, for Africa to really grow and create more work opportunities for young people, we need to transform economies. And transforming economy meaning adding value to primary products.

It means a healthier workforce. So STEM education is important for the socio -economic transformation of the continent. I would argue it is more important for Africa now than other regions of the world because of this big agenda to transform economies.

0:04:05

(VO)

The transformation Peter speaks of begins where learning and opportunity meet, in institutions that give Africa's brightest minds the tools to build real change. At the African Institute for Mathematical Sciences, that journey has been unfolding for over 20 years.

0:04:24

(Prof. Sam Yala Centre President AIMS Rwanda)

We started in 2003 as an academic institution offering a postgraduate training in mathematical sciences for young Africans coming from different parts of the continent.

And since then, African Institute for Mathematical Sciences has evolved into the largest network of centres of excellence in mathematical sciences here in Africa.

0:05:04

(Blaise Tchapnda Academic Director | AIMS Rwanda)

Teaching at Aims is a bit different from my teaching in another university in the sense that our students come from various backgrounds. You have in the same class people who did undergraduate in mathematics, fundamental, mathematics applied, fundamental statistics, applied statistics, computer engineering, computer science, physics, and even other engineering.

We try our best to to accommodate all these backgrounds. So when you have a course, you should know that you should start at the very basic level and you should end at the state of the art so that people who have the background in what you teach don't get lost. And the people who never took the class, this type of class, are not lost as well.

0:06:06

Alice Ikuzwe Deputy Principal | Rwanda Polytechnique, Kigali College

And this was a game changer. Coming from a background of mechanical engineering, it opened my eyes to the power of mathematical thinking in different disciplines. It also sharpened my analytical skills and somehow also expanded my problem -solving approach. It connected me with a vibrant network of innovators, but personally, it pushed me to embrace new challenges and also step confidently beyond my fields.

0:06:43

(VO)

From the vision that built Aims, to the classrooms where it comes alive, every story begins the same way, with a student discovering what learning can unlock.

0:06:54

(Arlette Musanabera Alumna | AIMS Rwanda)

I have a background in mathematics and statistics, that's what I did for my bachelor's, and right now I'm completing a master's degree for data science, so I identify as a data scientist as of now. I was better at mathematics.

So that encouraged me to pursue them even in high school. So that's how I found myself doing it even in my bachelor's. And as I pursued the mathematics, I liked the data science part of it. I wanted to make sense of a bunch of information.

0:07:31

(VO)

The strength of STEM comes alive when numbers start to mean something. when young minds turn data into understanding and understanding into solutions that touch real lives.

0:07:44

Prof. Sam Yala Centre President | AIMS Rwanda

M's approach to STEM education is something which is really unique. We designed the program in such a way that we provide some foundation, mathematics foundation, to ensure that background is well mastered by people coming from different background and also different education system.

EMS is a Pan -African network welcoming students from all over the continent. Number two, we make sure that at the end of the one -year training, which in some cases can be extended with an industrial attachment, but at the end of that one -year training, the students are all very well equipped to either engage directly with the industry in different capacities as data scientists, data engineers, or those who wish that can push you with research by doing a PhD.

0:08:54

(Hon. Paula Ingabire Minister of ICT & Innovation | Rwanda)

The work of AIMS extends far beyond its walls, feeding directly into the country's innovation systems, a vision shared by Honourable Minister Paula. AIMS is, I think you could see them from two, in two ways. One, they're an educational partner. Two, they also are home to a huge research network, network of researchers from across Africa.

So when, For the Ministry of ICT and Innovation, where AIMS is coming in handy because of our innovation mandate, innovation can only thrive if you have the right investments that you're putting in research and development, but you also have, you know, a pool of researchers that are working on real -world challenges and sort of a pool their expertise, their knowledge to how this can be solved.

0:09:45

(VO)

It's through collaborations like this that national goals come to life, giving young people the tools to experiment, to fail and to find new ways of solving everyday challenges.

0:09:48

Alice Ikuzwe Deputy Principal | Rwanda Polytechnique, Kigali College

Take the example of London Port Technique, where we focus more on practical skills, but also students should have that creativity. Not always tell them what to do and how to do it, but come up with an innovative way to do things, looking at the way they should also respond to the challenges or to the needs of the country or continent in general.

0:10:25

(Blaise Tchapnda Academic Director | AIMS Rwanda)

You always tell students, yes, you know, you cannot learn without doing any assessment. And when you do assessment, grades, marks are there. But this is not the most important. The most important thing is to acquire skills.

At the end of the course, I should make sure that there are some specific skills that I equip my learners with. And I should have some mechanism to assess whether they really acquired those skills or not.

0:11:00

(VO)

Learning by doing builds more than skill. It teaches patience, curiosity and the courage to keep going when problems take time to solve.

0:11:14

(Arlette Musanabera Alumna | AIMS Rwanda)

STEM has widened my perspective on life. It has opened my eyes and made me approach things with an open mindset. It has made me more analytical, but also more patient. Because through STEM, you learn that some problems don't have quick solutions to them.

Sometimes it takes time, and failure is always there. part of that process, but through building resilience and commitment, you can make the change you actually want to see.

0:11:43

(VO)

What Arlette describes is something many young Africans are learning, that progress takes time and failure is part of the path. It's a new way of thinking that's redefining how they learn and how they lead.

0:11:57

Alice Ikuzwe Deputy Principal | Rwanda Polytechnique, Kigali College

So, the experience I had at EMS of having that mathematics skills, that problem solving, that critical analysis. That's what I want a student to have, but again, apply it in 2025. That time we were using those skills in 2011, so the technology was not the same.

0:12:16

(VO)

The tools of learning may change, but the purpose remains, to nurture a generation that questions, thinks for themselves, and keeps learning as the world keeps changing.

0:12:27

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

STEM -educated youth have a critical role to play in solving our current challenges. For one, their minds are agile. It is easier for a young person to learn coding and the latest technological solutions than it is for me to learn those things today.

Two, they're more in touch with societal needs. Three, you're more creative when you're younger. And it's a large demographic, and they understand the challenges in a very different mindset from the way perhaps the rest of us understood. So the question for them is and the challenge for them is to understand the challenges and come up with creative solutions that leverage technology.

0:13:22

(Prof. Sam Yala Centre President AIMS Rwanda)

It's a fact that STEM education and the STEM applications in general can be seen as a powerful tool or a powerful vehicle to drive the economic development of countries and to improve people's life, the quality of life of people.

0:13:49

(VO)

The creativity and agility of young people are only the beginning, real change happens when those talents connect with the science, technology, and systems that drive economies forward.

0:14:02

Dr. Peter Materu Chief Program Officer | Mastercard Foundation

For transformation to happen, to transform economies, you need not only the basic knowledge, but you need a critical mass of people who can bring in the science and the math and the engineering to add value, products and services, so that you can get to that higher value economy. And that can only happen if you also have a strong higher education and TVET system.

0:14:33

(Hon. Paula Ingabire Minister of ICT & Innovation | Rwanda)

The gaps that we've identified in STEM education are gaps that you pretty much see elsewhere. I think the difference is scale. Starting with, do you have teachers that have the subject matter expertise in the different programs.

It could be basic coding, it could be Internet of Things, it could be artificial intelligence. The second challenge is around infrastructure, and this can be seen in many ways. There's broadband connectivity.

0:15:00

(Hon. Paula Ingabire Minister of ICT & Innovation | Rwanda)

You need to have high -speed broadband connectivity, especially if you're integrating hybrid learning methods that make sure that students can self -teach, can access many of the materials online, and be able to complement what they're getting in the classroom. You're thinking about electricity, access to electricity.

You're also thinking about labs. For many of these STEM initiatives, you need labs. that are well equipped so that there's that hands -on training that is happening and we're shifting from theoretical type of learning, which has really been happening in Rwanda with the investments that we have.

So there are challenges, but there's also strategies working with different ministries and partners that we're putting in place so that we can gradually close the gap and ensure that at least all our learners, regardless of where they are in Rwanda, have equal access to the same quality of education and resources that we are providing as the Government of Rwanda.

0:15:55

(VO)

As governments work to close the gap between ambition and access, investing in teachers, technology and spaces where every learner can find their place. For many young people across the continent, that journey still begins with believing they belong.

0:16:12

(Arlette Musanabera Alumna | AIMS Rwanda)

As a girl in STEM, one of the biggest challenges has been self -doubt and feeling like sometimes I don't belong in certain spaces. You know, there is still a lot of stereotypes and unconscious biases about women in general, including us girls in STEM, and sometimes those are not just imposed to us from the outside.

0:16:34

Alice Ikuzwe Deputy Principal | Rwanda Polytechnique, Kigali College

If you don't have a supporting system, I mean, in the college, if they don't support you, you may also go through the harassment, where now you are harassed because you are into male -dominated, and you end up now trying to behave like them so that you can fit. in their system, which is totally wrong, because you have to be a female in male -dominated, not a female look like a male in male -dominated.

Lucky enough, we don't have those. Yes, maybe in some cases we may find those stereotypes, but when you look at the trace, how females now are participating, are studying those themes, you could see now there's a change.

0:17:19

(VO)

Every barrier these women push through leaves a mark. A quiet reminder that inclusion isn't just about access. It's about the world learning how to make room. But even courage needs structure behind it. And that's where the next challenge begins.

0:17:37

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

Funding is still a constraint. There are many students who are not able to access the learning because they can't afford and university education is still, and even tertiary education is expensive. Then there's our research and innovation capability. We've largely been a recipient of technology rather than a developer of technology. So you're catching up.

0:18:04

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

The ability of governments to provide funding for research in universities, that is limited because of the fiscal constraints. So it puts our academic institutions at a disadvantage. relative to other institutions in the West where you have better access to funding.

For ability to absorb this talent once they graduate, unemployment rates are high and our VC industry is not as well developed. So the conversion to them being able to go to a Silicon Valley kind of ecosystem and get funding for ideas, that is still nascent because of the high cost of capital in the market.

0:18:53

(VO)

Innovation needs more than ideas, it needs access. With limited resources, the next breakthrough will depend on how quickly Africa adapts to new ways of learning and sharing knowledge.

0:19:07

(Blaise Tchapnda Academic Director | AIMS Rwanda)

We need to adapt, we need to adapt all these approaches, pedagogical approaches to AI. It is important to make sure that you can learn everywhere and in time. So to digitalize resources so that an African can get access to quality education wherever he is and whenever he wants to get access to education.

0:19:39

Prof. Sam Yala Centre President | AIMS Rwanda

There is a gap. There is a gap of where we should be in terms of numbers, and also in terms of quality education in STEM. So all is about investing in STEM education. And the way EMS sees it is not, so when we invest in STEM education in an institution like EMS, it also has ripple effects to The whole ecosystem, because EMS never operates in a silo, but we have partnerships with local education systems.

0:20:23

(VO)

Every investment in education strengthens the next, linking classrooms, institutions and policy in one connected effort to drive innovation.

0:20:34

(Hon. Paula Ingabire Minister of ICT & Innovation | Rwanda)

And so through the innovation mandate, we've been working with different partners and not just AIMS that are interested. And this is where we're trying to mobilize a lot of support to see how much investment we can put into research and development, but research and development that then translates into applied research, where you're starting to see products

that are coming out, new ways of doing things that are coming out of this research, that is also being deployed in society, and then you can start to see the benefits of doing exactly that.

0:21:06

(VO)

The value of research lies in what it changes. When ideas move from labs into real life, that's when innovation truly matters. But turning those ideas into impact takes vision and leaders who can bring others along.

0:21:21

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

Leadership is about painting a clear picture of the vision and communicating it. And I think there's more need for clearer visioning and communication of what this feature can do and what STEM would potentially mean for the future of this continent, I think, for starters Parties. And that would enable all other parties to then coalesce around supporting that vision, whether it is government itself, whether it is a private sector, whether it is academia.

0:21:58

Dr. Peter Materu Chief Program Officer | Mastercard Foundation

The private sector is part and parcel of the journey. It can be part of the learning infrastructure by being the place where young people can go to learn, either through internships or even visits. And private sector people coming into schools, contributing to inspiring young people about what the possibilities are.

And then over time, as we get to higher education, it's also about supporting critical research and innovation, supporting not only in terms of money, but being really a partner with institutions of higher learning in developing innovations that are relevant to our economy.

And so it requires continuous engagement with the leaders who are responsible for this, showcasing the impact and shock and talking about what would be possible if we could unlock the barriers. It's a continuous work, but it's absolutely important.

0:23:04

(VO)

Clear vision only works when it's shared, when leaders, educators and industry pull in the same direction.

0:23:12

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

The inclusion of women and underserved communities is critical to the STEM agenda for several reasons. One, we cannot afford to leave any portion of the population behind. So, women

account for roughly 50 % of the population, of the youth population. Women also bring a very unique perspective, which is critical in us developing this STEM program.

0:23:40

Dr. Peter Materu Chief Program Officer | Mastercard Foundation

The inclusion is a major piece of the Foundation's, actually we say it's part of the Foundation's DNA, because the vision statement that everyone, irrespective of his or her beginnings, should have the opportunity to learn and prosper, recognizes that it's not only the people that are out there who can seize opportunities as they get exposed to them.

But rather, everyone, even those that are not exposed to opportunities, we should make an effort to reach them and make sure that we include them in what we do.

0:24:28

(Prof. Sam Yala Centre President AIMS Rwanda)

So it's really about building the pipeline and making sure that the pipeline from the beginning is inclusive. So we need more, we need many girls as we need many boys.

0:24:49

(VO)

Step by step, inclusion is becoming real in classrooms, in training programs, and in the lives of young women choosing STEM. It's a shift you can feel and for many, it's also a story they have lived.

0:25:04

(Arlette Musanabera Alumna | AIMS Rwanda)

To a girl out there that wants to pursue STEM, you're more capable than you think and you're not giving yourself enough credit for it. It's okay to feel unsure at first, but do not let that stop you, because STEM needs you as much as you need it, and if not more.

0:25:21

Alice Ikuzwe Deputy Principal | Rwanda Polytechnique, Kigali College

Try to find a role model. They do help a lot because they support you, they encourage you to know that if Alice did it, I can do it. So they should not really stay there and then be demotivated because of those negatives about what they should do and what they should not do. They have to believe what they are capable of and also try to find the role models and fight for what they deserve.

0:25:51

(Dr. James Mworia MD & CEO | CENTUM Investment Company)

When I ask my children, what do you want to be? Not one of them mentioned a lawyer, not one of them mentioned an accountant, not one of them mentioned... They're all doing all this... One

said they want to be a gamer, another one wants to be involved in AI. So I think the shift has happened. So the idea is for us to make it a reality for them.

0:26:12

(VO)

These are the voices shaping a new generation. Young people ready to learn, lead and build Africa's future.

0:26:20

Prof. Sam Yala Centre President | AIMS Rwanda

My call is for decision makers in Africa to keep investing in quality STEM education because this is really a powerful vehicle to drive the economic development of our countries and to change people's lives for the better.