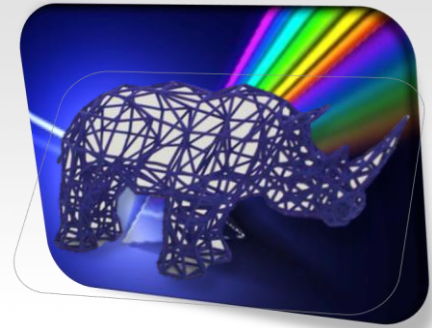




INCLUSIVE ECONOMIC DEVELOPMENT



REFRACTED ECONOMIES: Reimagining youth livelihoods in an age of technological innovation

Professor Sharlene Swartz,
Krish Chetty and Seipati Mokhema
| 23 April 2020



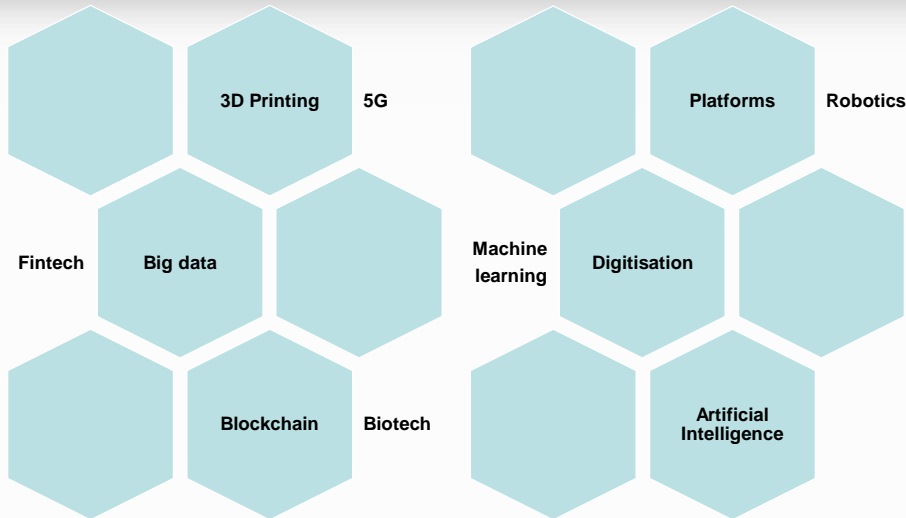
Why this discussion?

1. Youth unemployment
2. Youth views about work
3. The changing nature of work
4. The revolution in tech
5. The changing nature of education
6. TVETs
7. Focus on entrepreneurship
8. Focus on STEM skills
9. Lessons from our current CoVid crisis

49%



The revolution in technology



Inclusive Economic Development

“The new economy must be founded on fairness, empowerment, justice and equality. It must use every resource, every capability and every innovation we have in the service of people.”

Cyril Ramaphosa
 President of South Africa,
 21 April 2020



Lessons from the CoVid Crisis

1. The difference between essential work & pointless(?) work
2. The role of the state in people's lives and livelihoods
3. What needs to be supported, e.g. UBI v. SAA
4. Some jobs/economic activities are not coming back post-CoVid
5. Inequality will destroy us all
6. We don't need as much – planet, climate, consumption
7. Data and (a tool) an essential basic
8. Localized production is critical
9. Informal trading is the lifeblood for many
10. Limiting corruption a widespread response to President's plan



Current talk: youth and work (1)

1. "What do you want to be when you grow up?"
"A doctor, a lawyer, a pilot... if not then a taxi driver or a domestic worker."
2. "We need to teach entrepreneurship in schools".
2% of youth entrepreneurship ventures succeed.
3. "There is a skills mismatch in South Africa... we need a focus on STEM skills".
29% UG pursued STEM courses, 10% employed in field



49%





Current talk: youth and work (2)

4. “We need free university education”.

40% of youth choose university over TVET. University does not (yet) prepare young people for the (changing) world of work.



5. How do young people enter the world of work without the ability to: read, write and reason? Unable to solve problems, develop confidence, handle (possess) basic technology, work in teams, manage complexity, **AND IMAGINE** possibilities? **What could we be doing differently?**



What are the big ideas?

1. Re-characterise jobs into a range of colour-coded (refracted) economies in order to
 - See where new jobs are emerging
 - Where jobs are likely to disappear
 - To give work new forms of esteem
2. Use a range a continua to characterise kinds of jobs
3. Differentiate between jobs, livelihoods, careers, work, employment, with a focus on change over time
4. Map out the implications for schools, TVETS, universities, young people, and those who support them
5. A research proposal



CLASSIFYING THE ECONOMY

1° Extraction

2° Production/Manufacturing

3° Services

Classifying/colour-coding work by purpose (1)

- **Orange:** To provide creative, cultural and leisure products and services
- **Green:** To enable the production and use of clean energy resources
- **Blue:** To utilise water resources for economic growth
- **Lavender:** To provide care and help
- **Yellow:** To provide and conserve public goods, education, human rights and community support

- **Bronze:** To produce and supply raw materials (food and minerals) and related manufactured products (agriculture and mining)
- **Silver:** To maintain and develop infrastructure— construction, plumbing, electrical, technicians, transport
- **Gold:** To manage finance and assets
- **Platinum:** To innovate to ensure other work is more effective and efficient
- **Red:** To circumvent the law in order to make money
- **Invisible:** Unrecognised work

REFRACTED ECONOMIES

Orange (Creative/Cultural/Leisure)

Blue (Water Resources)

Green (Clean Energy Resources)

Yellow (Public Goods/Education/Community)

Lavender (Caring/Helping)

Bronze (Produce/Extract/Manufacture/Supply)

Silver (Develop/Maintain Infrastructure)

Gold (Asset/Finance Management)

Platinum (Tech/X-tech)

Red (Criminal)

Invisible (Unrecognised)

A RANGE OF CHARACTERISTICS ALONG A CONTINUUM (1)

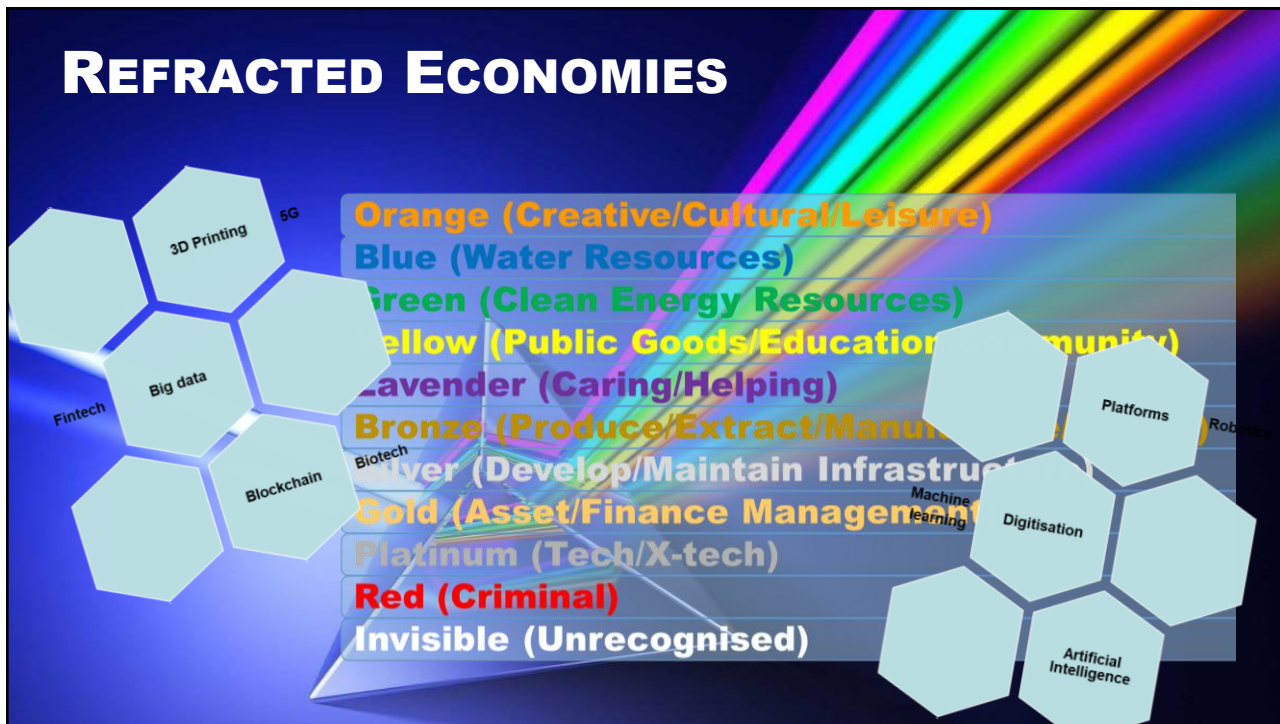
SKILLED ----- UNSKILLED
 ENTREPRENEURIAL (INNOVATE) ----- BUSINESS AS USUAL (IMITATE)
 FORMAL ----- INFORMAL
 PRIVATE ----- PUBLIC
 BLUE COLLAR ----- WHITE COLLAR
 PROFESSIONAL ----- ARTISANAL
 INDIVIDUAL ----- COLLECTIVE
 PERMANENT ----- GIG

A RANGE OF CHARACTERISTICS ALONG A CONTINUUM (2)

1 ----- KNOWLEDGE ----- 10
 1 ----- TECHNOLOGY ----- 10
 1 ----- SUSTAINABLE ----- 10
 1 ----- CREATIVE ----- 10
 1 ----- COMPLIANT ----- 10

DECENT AND DIGNIFIED WORK

1 ----- RESPECTED BY COMMUNITY ----- 10
 1 ----- BENEFITS OTHERS ----- 10
 1 ----- OPPORTUNITIES FOR GROWTH ----- 10
 1 ----- FAIR TREATMENT ----- 10
 1 ----- FAIR INCOME ----- 10



Orange – to provide creative, cultural and leisure products and services			
	Entry-Level	Intermediate	Senior (Advanced Skills)
Creative		Photographers and image and sound recording equipment operators	Film, stage and related actors and directors
		Photographic and related workers	Composers, musicians and singers
		Bookbinders and related workers	Choreographers and dancers
		Silk-screen, block and textile printers	Sculptors, painters and related artists
		Glass and ceramics kiln and related machine operators	Musical instrument makers and tuners
		Glass, ceramics and related plant operators not elsewhere classified	Glass, ceramics and related decorative painters
		Photographic-products machine operators	Handicraft workers in wood and related materials
		Printing-machine operators	Handicraft workers in textile, leather and related materials
		Bookbinding-machine operators	Glass engravers and etchers
		Bookmakers and croupiers	Authors, journalists and other writers
		Weaving- and knitting-machine operators	Clowns, magicians, acrobats and related associate professionals
		Sewing-machine operators	Glass makers, cutters, grinders and finishers
		Bleaching-, dyeing- and cleaning-machine operators	Decorators and commercial designers
		Fur and leather-preparing-machine operators	Jewellery and precious-metal workers
	Cultural	Library and filing clerks	Compositors, typesetters and related workers
		Printing engravers and etchers	Stereotypers and electrotypers
		Librarians and related information professionals	Archivists and curators
Leisure		Astrologers and related workers	
		Fortune-tellers, palmists and related workers	
	Messengers, package and luggage porters and deliverers		Production and operations department managers in restaurants and hotels
	Doorkeepers, watchpersons and related workers		General managers of restaurants and hotels
	Travel agency and related clerks	Travel attendants and travel stewards	
	Travel consultants and organisers		
	Travel guides		
	Waiters, waitresses and bartenders	Street, night-club and related musicians, singers and dancers	

Orange – to provide creative, cultural and leisure products and services					
	Entry-Level	Intermediate	Senior (Advanced Skills)		
Creative	<ul style="list-style-type: none"> Assistants are invisible and not counted in ILO Framework Can apprenticeships in vocational work help increase number of entry-level jobs? 	<ul style="list-style-type: none"> Handicraft type work Machine operators Requires skills in domain areas Repetitive work could be replaced or evolved The role of co-bots will emerge 	<ul style="list-style-type: none"> Film, stage and related actors and directors Composers, musicians and singers Choreographers and dancers Sculptors, painters and related artists Musical instrument makers and tuners Glass, ceramic and related decorative workers Handicraft workers in wood and related materials Handicraft workers in metal and related materials Authors, journalists and other writers Cowns, magicians, acrobats and related associate professionals Glass makers, cutters, grinders and finishers Decorators and commercial designers Jewellery and precious-metal workers Abrasive wheel formers, potters and related workers Stereotypers and electrotypers 		
		Cultural	<ul style="list-style-type: none"> Librarians, museum curators, astrologers 	<ul style="list-style-type: none"> Librarians and related information professionals Archivists and curators Fortune-tellers, palmists and related workers 	
			Leisure	<ul style="list-style-type: none"> Entertainment, hospitality, tourism 	<ul style="list-style-type: none"> Production and operations department managers in restaurants and hotels General managers of restaurants and hotels
		Messengers, package and luggage porters and deliverers			
		Doorknockers, watchpersons and related workers			
		Travel agency and related clerks			
		Travel attendants and travel stewards			
		Travel consultants and organisers			
		Writers, waitresses and bartenders	Street, night-club and related musicians, singers and dancers		


Lavender – to provide care and help			
	Entry Level	Intermediate	Senior (Advanced Skills)
Helping	Housekeepers and related workers	Philologists, translators and interpreters	Production and operations department managers in personal care, cleaning and related services
	Domestic helpers and cleaners		General managers in personal care, cleaning and related services
	Helpers and cleaners in offices, hotels and other establishments	Sanitarians	
	Hand-launderers and pressers	Shoe cleaning and other street services elementary occupations	
	Vehicle, window and related cleaners	Cooks	
Caring	Medical assistants	Nursing and midwifery professionals	Pharmacologists, pathologists and related professionals
	Dental assistants	Nursing associate professionals	Medical doctors
	Veterinary assistants	Medical equipment operators	Dentists
	Pharmaceutical assistants	Midwifery associate professionals	Veterinarians
		Traditional medicine practitioners	Pharmacists
		Faith healers	Health professionals (except nursing) not elsewhere classified
		Social work associate professionals	Psychologists
		Child-care workers	Social work professionals
		Institution-based personal care workers	Dieticians and nutritionists
		Home-based personal care workers	Optometrists and opticians
	Personal care and related workers not elsewhere classified	Physiotherapists and related associate professionals	
		Modern health associate professionals (except nursing) not elsewhere classified	

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	Helping and cleaners in offices, hotels and other establishments		
	Hand-launderers and pressers		
	Vehicle window and related cleaners	Cooks	
<ul style="list-style-type: none"> Limited digital disruptions to the manner work is carried out Technology influences the medium of finding work Physical home/office based cleaning, helping roles Domestic workers, laundry workers, cooks Question: What are the options for the Domestic Worker to progress in this field? <ul style="list-style-type: none"> There are limited Intermediate level career options 			
Caring	Medical assistants	Nursing and midwifery professionals	Pharmacologists, pathologists and related professionals
	Dental assistants	Nursing associate professionals	Medical doctors
	Veterinary assistants	Medical equipment operators	Dentists
	Pharmaceutical assistants	Midwifery associate professionals	Veterinarians
		Traditional medicine practitioners	Pharmacists
	<ul style="list-style-type: none"> Healthcare, veterinary, faith-based workers, social work and dietary work (except nursing) not elsewhere classified Technology influences modes of communication, typical tools used. Will require professionals to stay current 		
			Physiotherapists
		Institution-based personal care workers	Dietitians and nutritionists
		Home-based personal care workers	Optometrists and opticians
		Personal care and related workers not elsewhere classified	Physiotherapists and related associate professionals
		Modern health associate professionals (except nursing)-not elsewhere classified	


Bronze – to produce and supply raw materials (food and minerals) and related manufactured products (farming and mining)			
	Entry Level	Intermediate	Senior (Advanced Skills)
Extractive	Miners and quarry workers	Shotfirers and blasters; Stone splitters, cutters and carvers	Geologists and geophysicists
	Mining and quarrying labourers	Mining-plant operators	Mining engineers, metallurgists and related professionals
		Raw-material processing plant operators	
		Extruders	
		Forestry workers and loggers	
Agriculture	Field crop and vegetable growers		Agronomists and related professionals
	Tree and shrub crop growers	Hunters, trappers	General managers in agriculture, hunting, forestry
	Subsistence agricultural	Butchers and related food preparers	Production and operations department managers in agriculture, hunting and forestry
	Farm-hands and labourers	Food producers	
	Subsistence agricultural and fishery workers	Bakers, pastry-cooks and confectionery makers	
	Forestry labourers	Dairy-products makers	
	Fishery, hunting and trapping labourers	Fruit, vegetable and related preservers	
		Food and beverage tasters and graders	
		Tobacco preparers and tobacco products makers	
		Fibre preparers	
Manufacturing		Food processing machine operators	
		Raw-material plant operators	Production and operations department managers in manufacturing
Supply Chain Distribution	Freight handlers	Automated-assembly-line operators	General managers in manufacturing
	Vending-machine money collectors, meter readers and related workers	Products machine operators	Supply and distribution department managers
	Street food vendors	Assembly line operators	Production and operations department managers in wholesale and retail trade
	Street vendors, non-food products	Product distribution	General managers in wholesale and retail trade

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	Mining and quarrying labourers	Mining-plant operators	Mining engineers, metallurgists and related professionals
		Raw-material processing plant operators	
		Extruders	
		Forestry workers and loggers	
Agriculture	Field crop and pasture preparers		Agronomists and related professionals
	Truck drivers		General managers in agriculture, hunting and forestry
	Subsistence farm-hands and labourers	Butchers and related food preparers	
	Subsistence farm workers	Food producers	
	Subsistence forestry workers	Confectionery makers	
	Workshop fitters	Food and beverage taster and graders	
	Fishery workers	Food and tobacco products makers	
Manufacturing		Food processing machine operators	General managers in manufacturing
			General managers in manufacturing
Supply Chain Distribution	Freight handlers	Automated-assembly-line operators	Supply and distribution department managers
	Vending-machine money collectors, meter readers and related workers	Products machine operators	Production and operations department managers in wholesale and retail trade
	Street food vendors	Assembly line operators	General managers in wholesale and retail trade
	Street vendors, non-food products	Product distribution	

- 79 Professions across Extractive, Agriculture, Manufacturing and Supply Chain Distribution Industries
- 89% of these jobs will be replaced or evolve due to the influence of technological disruption
- Is a need to concentrate on upskilling workers from basic labourers to gain access to intermediate and skilled positions
 - Can non-formal training and experience form the basis for formal certification?
 - What is the role of TVETs?
 - Can employers drive the upskilling programme?
- Important to recognise the informal workers engaged in these industries



Tech Disruptions in the Orange Economy



find **CREW**. **BOOK** them. find **SUPPLIERS**. **WORK** with them.

CREWPENCIL OVERVIEW PRICING FAQ TERMS 071 674 2506 SUPPORT@CREWPENCIL

Creative workers in the Gig-Economy

- New tools give rise to new art-forms
- Photoshop – new art – memes
- New methods to market/sell your services
- New methods to sell your content (Apple iTunes, etc)
- CrewPencil.com supports the Cape Town Film Industry
 - Find extras and supplies for Film Industry

- New opportunities to collaborate
- Need marketing and digital skills

Refine Results

all Categories (223)

- Singer-Songwriters (143)
- Session Musicians & Singers (52)
- Producers & Composers (13)
- Mixing & Mastering (8)
- Sound Effects (8)
- Other (8)
- Logo Design (1)
- Jingles & Drops (1)
- Other (1)

Delivery Time

Up to 24 hours

Tech Disruptions in the Orange Economy



Digital Textile workers

- New tech is permeating through the textile industry
- Impacting the manufacturing and supply chain.
- Develop digital designs
- Embed data (dimensions, colours, etc) into the production of the clothing
- Customised creations
- Need to understand the tools
- Need entrepreneurs to invest in the tools to start new businesses

Tech disruptions in the Blue Economy

ABALOBI

ABOUT

| Backdrop | ICT4Fisheries | Development | Pilot sites |

Covering all aspects of small-scale fisheries from hook to cook:



Cooperative Based Supply Chain in Fishing Industry "From Hook to Cook"

Requirements

- Fisherman needs a smart phone and data to access work
- Requires digital skills to operate the app
- Must be literate
- Requires a bank-account to be paid
- Fisherman logs data about yield and environment
- Linked to distribution local network

Benefits

- Governance is managed through co-operative model and based on data collected through the app
- Promote financial inclusion of marginalised communities
- Empowers the community – replaces the corporate business model

Challenge

- Pilot project must be scaled

Tech disruptions in the Green Economy



Entire energy ecosystem must change to adopt Climate Change Agreement

- Need to move fossil-fuels to clean energy
- Requires a complete shift in infrastructure, and KNOWLEDGE.
- New industries operate with new technologies and skill-sets
- Digital tools are embedded in the manufacturing of these tools
- Need engineers, scientists, plant operators to specialise in managing the production and distribution clean energy.

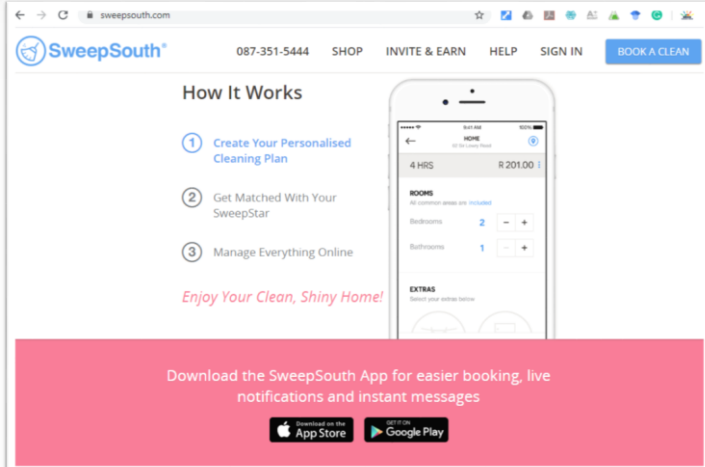
Tech disruptions in the Yellow Economy



Online Tutoring

- Desperate need to reduce the burden carried by teachers and parents in the COVID19 era
- Mass tutoring could address unemployment challenges and improve the quality of learning
- Needs to be supported with mass rollout of digital infrastructure and skills among learners and tutors

Tech disruptions in the Lavender Economy



The screenshot shows the SweepSouth website with a navigation bar including 'SweepSouth', '087-351-5444', 'SHOP', 'INVITE & EARN', 'HELP', 'SIGN IN', and 'BOOK A CLEAN'. The main content area is titled 'How It Works' and lists three steps: 1. Create Your Personalised Cleaning Plan, 2. Get Matched With Your SweepStar, and 3. Manage Everything Online. Below this is a mobile app interface showing a booking for 4 hours for R201.00, with room selection (2 Bedrooms, 1 Bathroom) and extras. A pink banner at the bottom encourages downloading the SweepSouth App for easier booking, live notifications, and instant messages, with links to the App Store and Google Play.

Location based matching platforms

Requirements

- Worker needs a smart phone and data to access work
- Requires digital skills to operate the app
- Must be literate
- Requires a bank-account to be paid

Challenges

- Worker is treated as an Independent Contractor
- Not catered for in SA Labour Law
- Work is semi-formal
- Platform dictates rate of pay
- Limited visibility in how is distributed

Benefits

- Role is clearly defined
- Rate of pay is determined up front
- Increasing opportunities of finding work

Tech disruptions in the Bronze Economy



The role of 3D Printing in Supply Chains

- South African Universities 3D Printing Surgical face shields
- Italian Hospital 3D Prints expensive Oxygen Valve
 - Patented oxygen valve cost 11000USD, and are out of stock!
 - 3D Printed valve cost 1USD

Learnings

- Traditional supply chains are failing
- Need to respond to local demands
- Is a need for reliance on local-manufacturing
- Require in-depth knowledge about the problem

Tech disruptions in the Silver Economy

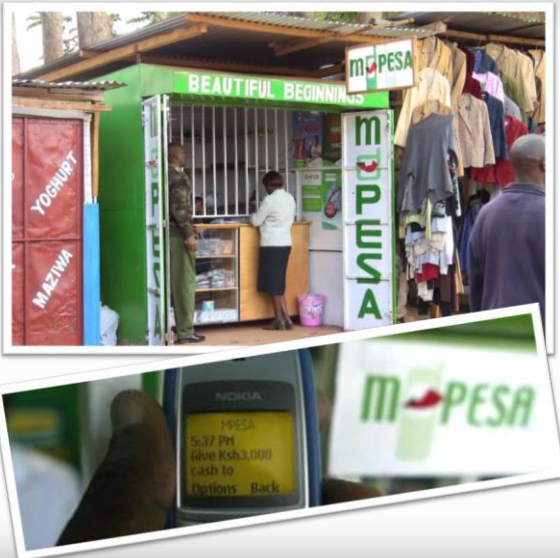


What do we need right now in Construction?

Examples

- Digital water meters
- Solar Water Heating
- Electronic gate motors
- Fibre installation
- These devices include digital chips and computing which require specialised skills to service
- Requires skilled installation and maintenance workers

Tech disruptions in the Gold Economy



Mobile money in increasing financial inclusion in East Africa

- Simplifies payments and transferring money among marginalised communities
- M-PESA in Kenya uses USSD technology, which is free and accessible across all devices
- Service is accessible across the country
- Requires a rollout of "Agent Bankers" in areas where its difficult to establish a fully-fledged bank branch



Tech disruptions in the Gold Economy



New Jobs in the Finance Sector

Fintech Liaison

Develops partnerships with new FinTech institutions, to promote innovative banking practices

RegTech Specialists

Regulators need to be up to speed with new FinTech advances, and introduce appropriate regulations to protect the market and promote innovation.

Sustainable Wealth Manager

Wealth manager who specialises in green industries linked to green bonds.

Cryptoforecaster

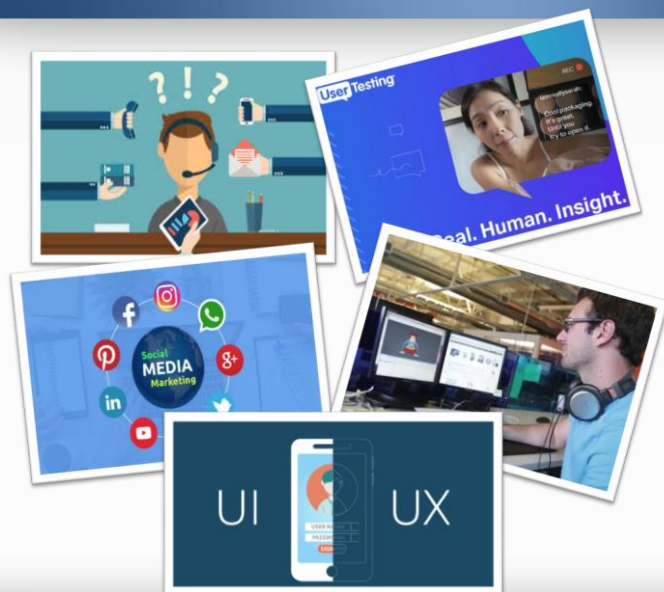
Specialist who can read trends in crypto-markets to ensure informed decisions are made, responsive to market dynamics

Cyber-Security Specialist

Security is paramount in the financial sector. Need a specialist who keeps up to date on cyber-security threats



Jobs in the Platinum Economy



Non-techie work in the Tech Sector

- Helpdesk officer
 - Understand how to troubleshoot computer problems
- User Testing
 - Test the output of coding to see if it matches results
- Social Media Marketing
 - Market businesses online, exposing them to new clients
- Animation
 - Learn animation tools to build small-scale animations
- UX Design
 - Prepare designs for websites and apps for businesses to engage their clients

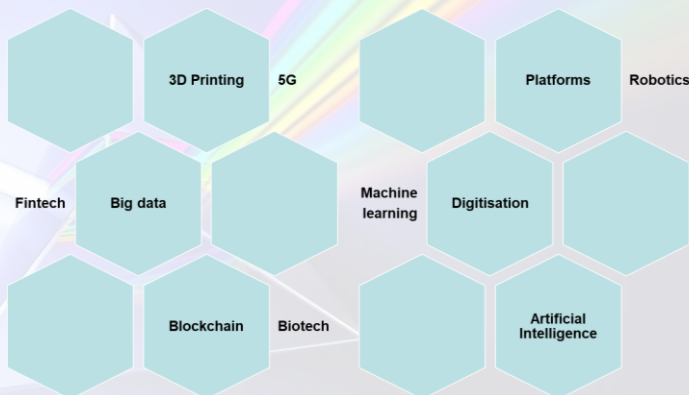
Proposed Research

- *How do we increase livelihood and work opportunities for young people?*
- How might a refracted economies framework help us to recognise new opportunities for work, for TVET opportunities and for primary/secondary school career guidance for young people on the African continent, in the context of technological innovation?

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RESEARCH TO ANTICIPATE HOW TECHNOLOGICAL INNOVATIONS WILL IMPACT ON OPPORTUNITIES FOR YOUTH?



TVETs AS HUBS OF INNOVATION IN REFRACTED ECONOMIES?



REIMAGINED CAREER GUIDANCE AT ALL LEVELS OF SCHOOL AND POST SCHOOL?



- PRIMARY SCHOOL
- EARLY HIGH SCHOOL
- GENERAL EXIT CERTIFICATE (GRADE 9)
- GRADE 11/12
- UNIVERSITY/TVET/NGOs
- ADULT EDUCATION
- WORKPLACE

SO WHAT? DIFFERENTIATING JOBS FROM CAREERS, WORK, EMPLOYMENT AND LIVELIHOODS, WITH CHANGE OVER TIME?



JOBS

CAREERS

EMPLOYMENT

WORK

LIVELIHOODS

Components of Study

Conceptual Rationale –
Refracted
Economies
and the
nature of
work

Tech into refracted
economies –
Innovations
systems analysis

Reimagining
school
career
guidance

Reimagining
TVETs

Synthesis - Agile
Learning Into
Practice Policy
Practice
Dialogues
(ALIPPD)

Learning Activity 1

Conceptual Rationale

- State of youth employment/futures
 - Digital inequality
 - Worker protection in future work
 - Continuities/discontinuities
 - Refracted economies – a sectoral review and linking industry, education and youth capacities
 - African and Southern contextual learning
- **Short term goal:** Write a literature review to undergird the full proposal
 - **Long term goal:** A position paper to reflect Africa's developmental state wrt to young people and the future of work in refracted economies

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Learning Activity 2

- Reimagining career guidance
 - Conceptual analysis
 - Policy implications
 - Programming implications
- **Short term activity:** Review of career guidance modalities in these countries
 - **Long term outcomes:** A refracted career guidance curricula at multiple levels

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Learning Activity 3

Reimagining TVETs

- Conceptual analysis
- Policy implications
- Programming implications

Short term activities:

- To ensure that all countries are connected to the Interministerial quality node of TVETs in Africa, and a network of scholars is convened
- 5 questions in Afrobarometer on perceptions of TVETs

Long term outcomes:

- Review curricula, policy and make recommendations for changed offerings

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Learning Activity 4

Tech into refracted economies

- Innovations systems analysis
- Policy implications
- Programming implication

Short term activity: Identifying a potential set of demonstration projects

Long term outcomes:

- A set of refracted innovations analyses (digital skills)
- Lessons from demonstration projects

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Learning Activity 5

- **Synthesis** - Agile Learning Into Practice Policy Practice Dialogues (ALIPPD)
- **Short term goal:** Sample **dialogues** about big issues in the field (digital inequality, worker protection and the future of work, rethinking universities)
- **Long term goal:** A **mechanism** for ongoing learning into practice dialogues between various players (government, labour, business/industry, education)

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Concluding Takeaways

1. Rehumanize/dignify all forms of work
2. Formalize/regularise informality
3. Localize production
4. Data and a tech tool as an essential basic
5. Minimise corruption
6. Reimagine pathways: with multiple characteristics, and across and between refracted economies
7. Embrace innovation, shed anachronistic jobs
8. Prepare young people for what's coming, what will change and the reality of livelihoods, jobs, work, opportunities not just careers, employment or entrepreneurship

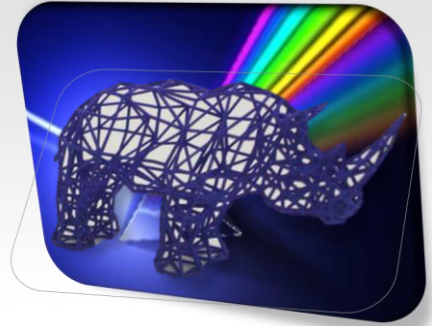




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Paper in Youth Voice Journal in Dec 2020



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