

IsiXhosa

Ama-highlights obudlelwane boluntu lwaseMzantsi Afrika nesayensi: Iziphumo zophando lowama-2022



science, technology
& innovation

Department:
Science, Technology and Innovation
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Iveliswe libhunga lophando lwesayensi yoluntu (HSRC) egameni lesebe lesayensii notshintsho lukusungula izinto ezintsha (DSI).

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Ukucaphula le ngxelo:

Isebe lezesayensi notshintsho (2024) Ama-highlights obudlelwane boluntu lwaseMzantsi Afrika nesayensi: Iziphumo zophando lowama-2022. Ilungiselelwe libhunga lophando lwezesayensi zoLuntu kwisebe lezesayensi kunye notshintsho. ePitoli: HSRC.



Le ngxelo yezi-highlights inggxxelo epheleleyo:

Isebe lezeNzululwazi notshintsho (2024) ubudlelwane boluntu lwaseMzantsi Afrika nesayensi: Iziphumo zophando luka-2022. Ilungiselelwe libhunga plwezeNzululwazi zoluntu kwisebe lezesayensi kunye notshintsho lukusungula izinto ezintsha. ePitoli: HSRC.

Inombolo yeprotokholi yekomiti yendlela zokuziphatha: REC/Imvuselelo yeprotocol engunombolo ye-REC 5/17/08/11: uphando lwezimo zettlalo yaseMzantsi Afrika (i-SASAS) 2019.

Unxibelelwano loluntu lwaseMzantsi Afrika nesayensi (SAPRS): Iziphumo zophando zango-2022 eziqokolelwe iminyaka engaphezulu kwemine yomsebenzi obandakanya ukuqulunqa uphononongo, ukuphuhlisa izixhobo, ukuqokelela idatha, ukuhlalutya idatha, kunye nokubhala ingxelo.

Ibiyintsebenziswano phakathi kwe-unit yokukhuthaza isayensi kwisebe lezesayensi kunye nokutshintsha lukusungula izinto ezintsha kunye nenkqubo yophando kunye ne-Equitable Education and Economics (EEE) kwiBhunga lophando lweHuman Sciences Research. Iqela le-DSI lalikhokelwa nguMnu Isaac Ramovha kunye neqela lophando le-HSRC nguGqr Vijay Reddy.

Kule minyaka emine, abona malungu eqela lophando ibingu-Gqr Vijay Reddy, uGqr Benjamin Roberts, uNksz Sylvia Hannan, kunye noGqr Steven Gordon.

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1 Isingeniso

Ulwazi lwesayensi luphakamisa ukuqonda kwethu ihlabathi, thina, kunye nobukho bethu. Kukho ukuvumelana okubanzi ukuba iinjongo zesayensi kufuneka zidlulele ngaphaya kweempembelelo zoqoqosho kunye nobuchwepheshe, ukujongana nemingeni yangoku yehlabathi neyethu echaphazela ngqo ubomi bethu. Kwasekuqaleni, ilizwe loMzantsi Afrika elilawulwa ngokwentando yesininzi\nge-democracy likubonile ukubaluleka kobudlelwane phakathi koluntu nesayensi, kwanokuba bonke abantu baseMzantsi Afrika kufuneka bathathe inxaxheba kwinguqoko ye-National System of Innovation (i-NSI).

Isebe lezesayensi notshintsholukusungula izinto ezintsha, likunye namahlakani alo, linoxanduva lokukhuthaza ukuzibandakanya nezesayensi ngaphakathi kwe-NSI. I-White paper mvanje ngezesayensi, ubuchwephesha\i-technology noTshintsho (i-STI) elakhelwe kumalinge angaphambili ngokuthethelela uluntu olunolwazi ngesayensi nenzululwazi, kwakunye nokuhlaziywa kogxininiso kwisayensi – amakhonkco oluntu (DST 2019a). Ukuvavanya inkqubela-phambili ekuphumezeni uluntu olunqwenelekayo olunolwazi lwesayensi nelaziyo ngesayensi, kunye neengqalelo entsha kwisayensi. Ukuvavanya inkqubela-phambili yokuzuzisa uluntu olunolwazi lwesayensi kunye olwaziyo ngesayensi, i-DSI iqale yaseka i-set yokulinganisa ukusebenza kwenkqubo yokuzibandakanya ngezesayensi ngokubanzi. Okwesibini, yamkele i-set ezingaphantsi zokuveza ukwazisa uphando lwamaxeshana ngamaxeshana kuluntu lwabantu abadala baseMzantsi Afrika ukulinganisa nokubeka iliso kumanqanaba olwazi lwesayensi, izimo zengqondo, kunye nokuzibandakanya.

Iinkqubo zokuzibandakanya kwisayensi kunye nomlinganiselo wobudlelwane phakathi koluntu nesayensi ziye zamiselwa ngokwemigaqo-nkqubo kunye

namaqhinga ahlukehlukehle, ezi the Science Engagement Strategy (DST, 2015), i-White Paper ngezesayensi, i-technology kunye nokusungula izinto ezintsha (DST, 2019a), kunye ne-Science Engagement Monitoring and Evaluation Framework ne Evaluation Impact Indicator Framework (DST, 2021).

Uvavanyo lokuqala olubanzi olujongiswe ekulinganiseni nasekubekeni iliso kumanqanaba oluntu olwazi lwesayensi, izimo zengqondo, kunye nokuzibandakanya zaqhutywa ngo-2022. Uvavanyo luya kuphindwa rhoqo emva kweminyaka emihlanu. [I-South African Public Relationship with Science Survey: Iziphumo zango-2022 \(DSI, 2024\)](#) – ipapashiwe. Le ngxelo yee-highlights ichaza ngokufutshane indlela ye-study kunye ne- Science Engagement Monitoring and Evaluation Impact Indicator Framework (SEMEIIF) esazisa ulwakhiwo lolwazi lwesayensi engama-27, izimo zengqondo, kunye nemilinganiselo yokuzibandakanya. Emva koko, sishwankathela ezona ziphumo ziphambili ngokuchaza amanqanaba (amanqaku aphakathi) kwimilinganiselo eyahlukeneyo, kunye nokwahluka kwamanqaku kumlinganiselo ngamnye. Okulandelayo, sinika ingxelo yokuba zeziphi iimpawu zentlalo yoluntu ebezinokuthi zikhokelele kulwazi olulungileyo lwesayensi, izimo zengqondo, kunye nokuzibandakanya.

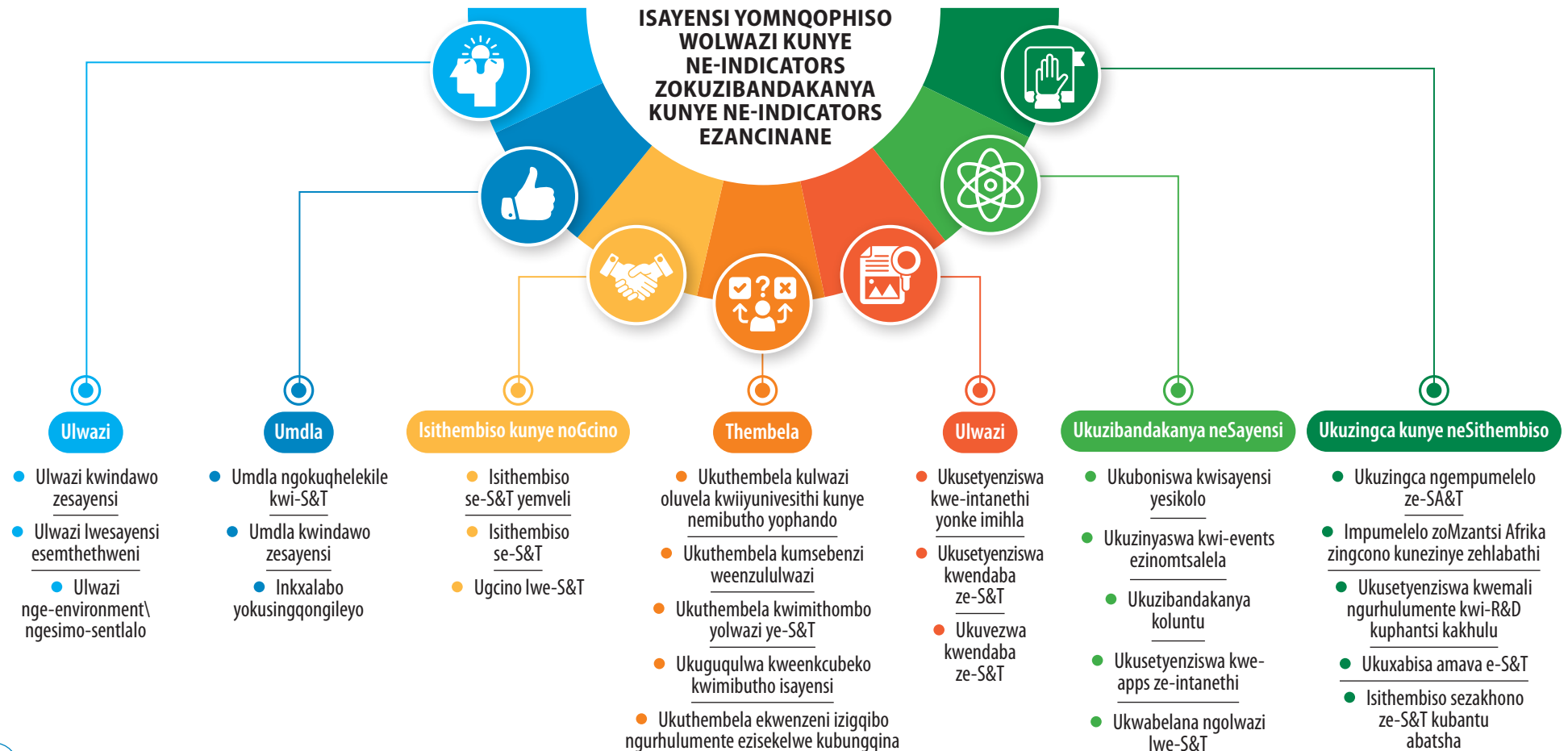
Sithi ke sibonise i-fingerprint wobudlelwane boluntu lwaseMzantsi Afrika nesayensi sisebenzisa amanqaku aphakathi [average] kunye nokwahluka kwinqanaba ngalinye lamalinganiso esayensi engama-27. La malinganiso ke ngoko ahluwe abe lunye lwezintlu ezine ngokwamanqaku aphakathi [average] kunye nokwahluka kwamanqaku. Siphetha ngokushwankathela iziphumo kunye neengcebiso.

2 Indlela Yophando

Isampulu/Abemi	I-sample emele abantu besizwe yabantu abadala abaneminyaka eyi-16 nangaphezulu, abakhethwe kwiindawo ezi\ezingama-500 kumaphondo alithoba.
Ubungakanani besampuli	5 960 abantu abaphenduli kwisampulu yesizwe.
Isixhobo sovavanyo kunye ne-framework yokunika ingxelo	I-Science Engagement Monitoring and Evaluation Impact Indicator Framework, yazise ngophuhliso lwesixhobo sovavanyo njengoko kunye nobume bengxelo.
Udliwano-ndlebe lovavanyo	Phakathi kukaNovember 2022 noJanuary 2023, udliwano-ndlebe lobuso ngobuso lweyure enye lwenziwa nabantu abadala abaneminyaka eyi-16 nangaphezulu. Udliwano-ndlebe lwenziwe ngolunye lweelwimi ezili-11 ezisemthethweni\ezisetyenziswayo, ngokusekelwe kukhetho lwabaphenduli.
Ukufakwa kolwazi	Ngokusebenzisa indlela yodliwano-ndlebe encediswa yikhompyutha (CAPI), ulwazi lwafakwa kwi-personal digital assistant (PDA).
Ubungakanani bedatha	Yonke idatha yalinganiselwa kubemi abaneminyaka eyi-16 nangaphezulu.
Ukunikwa kwengxelo yeziphumo	Iziphumo ezibalulekileyo ngokwamanani kwinqanaba le-95% lokuzithemba zixeliwe.
Izinto eziguquguqukayo ngokwentlalo yoluntu	Ubudala, isini, inqanaba lokufikelela kwimfundo, inkxaso yemfundo yasekhaya enikelwa ngabazali kunye nabanye abantu abadala (ukuxhasa ukufunda, umsebenzi wesikolo owenzelwa ekhaya, njl. njl.), imeko yentlalo-qoqosho esekelwe yi-asset index, i-statu somsebenzi, indawo yokuhlala, iinkolelo, neqela labantu lasetyenziswa. Sibhekisela kwezi njengamaqela angaphantsi.
Igama elithi 'isayensi' libhekisa ku	Ukuveliswa kolwazi kwiinkalo zemfundo: isayensi yendalo kunye nobomi, ubunjinieli, isayensi yezentlalo, kunye nobuntu.
Igama elithi 'uluntu' likwisinye kwaye liphindaphindwe	Kukho 'uluntu' olwahlukene eMzantsi Afrika ngokubume boluntu. Ngoko ke, igama elithi 'uluntu' libandakanya zombini isinye kunye noluntu olwahluka hlukeneyo.
Sisebenzisa idatha ezixeliweyo	Idatha yaqokelelwa ngemibuzo yophando apho abathathi-nxaxheba banikezela ngeempendulo zabo ngaphandle kokuqinisekiswa kwangaphandle.
Amanqaku aphakathi [average]	Amanqaku okwakhiwa kwento enye kunye nezinto ezininzi aguqulelwe kwisikali se-0–100. Amanqaku aphakathi [average] abalwa kwaye axelwa kwi-100 xa iyonke.
Ukwahluka kwamanqaku	Umahluko phakathi kwawona manqaku aphezulu naphantsi, ngokwamaqela angaphantsi.

3 I-Science Engagement Monitoring and Evaluation Impact Indicator Framework

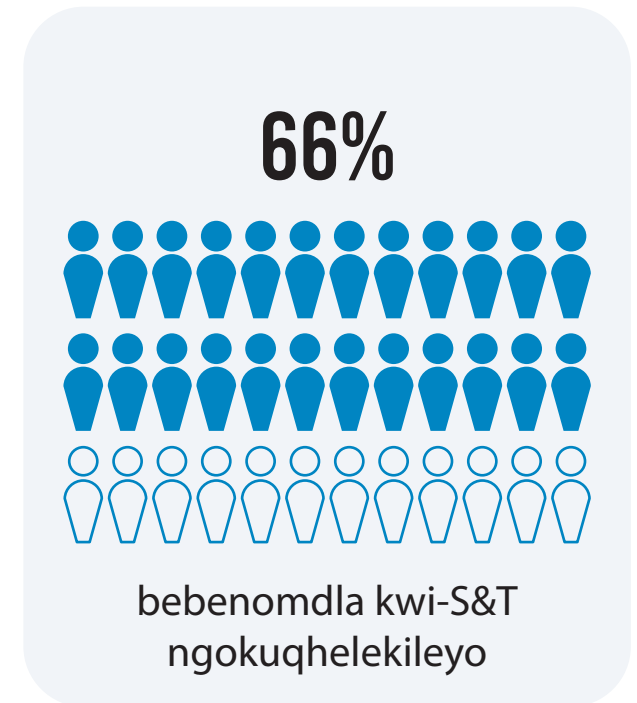
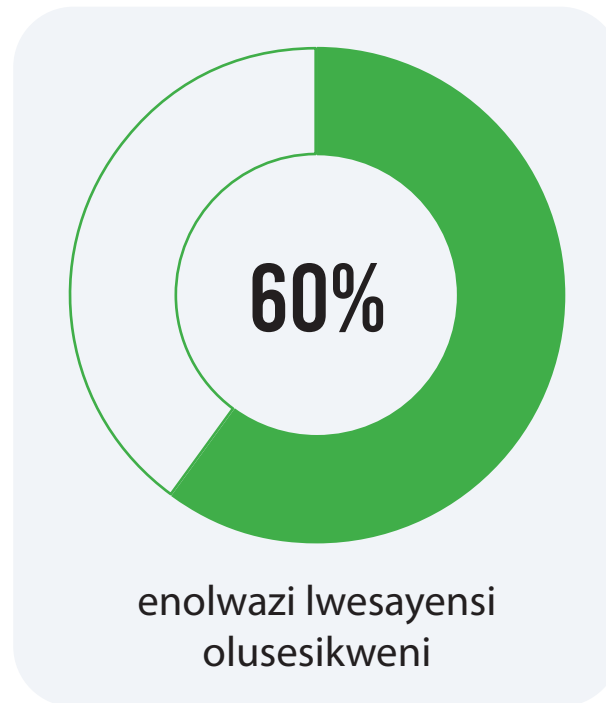
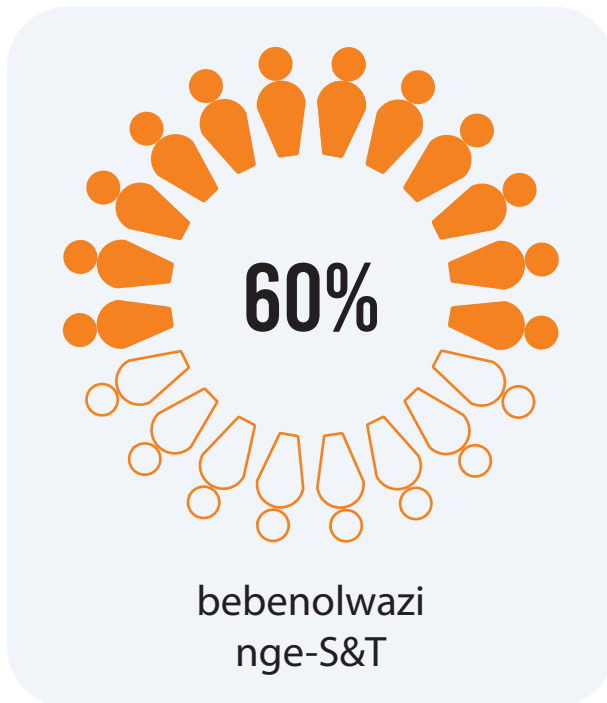
I-SEMEIIF yatshintshwa kancinane ukuze iquke izalathisi ezisixhenxe okanye imixholo yeempembelelo kunye nezalathisi ezingama-27 okanye imilinganiselo yempembelelo. Iimpawu yayilulwazi lwesayensi, i-technology (S&T) kunye nomdla; isithembiso nogcino kwakunye nezimo zengqondo zokuthembana; ulwazi lwe-S&T; kunye neziphumo zokuzibandakanya kwisayensi, kubandakanywa iibono ezinxulumene nokuzingca kunye nesithembiso se-S&T. Ukulinganisa nokusebenzisa i-indicator ngasinye okanye umxholo wempembelelo, sichonge phakathi kwemilinganiselo yempembelelo emithathu ukuya kwemihlanu. Kula macandelo alandelayo, sichaza iziphumo nganye yemilinganiselo yempembelelo. Ukufumana iinkcukacha ezithe vetshe ngeziphumo nceda ujonge [kwingxelo ephambili](#).



4 Ulwazi loluntu kunye nolwazi kunye nomdla kwisayensi ne-technology

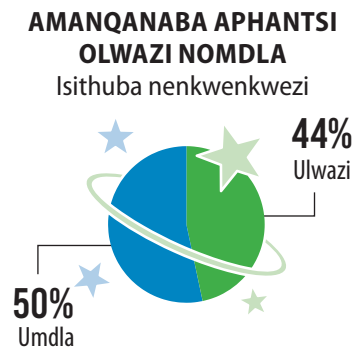
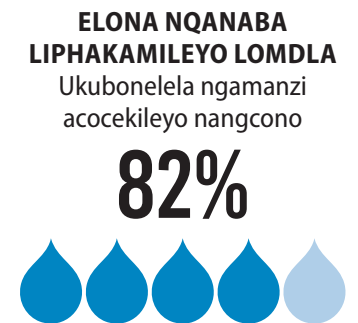
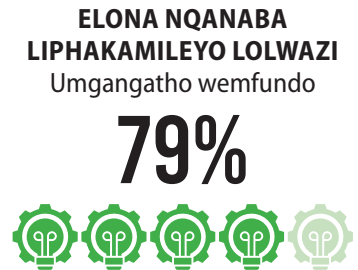
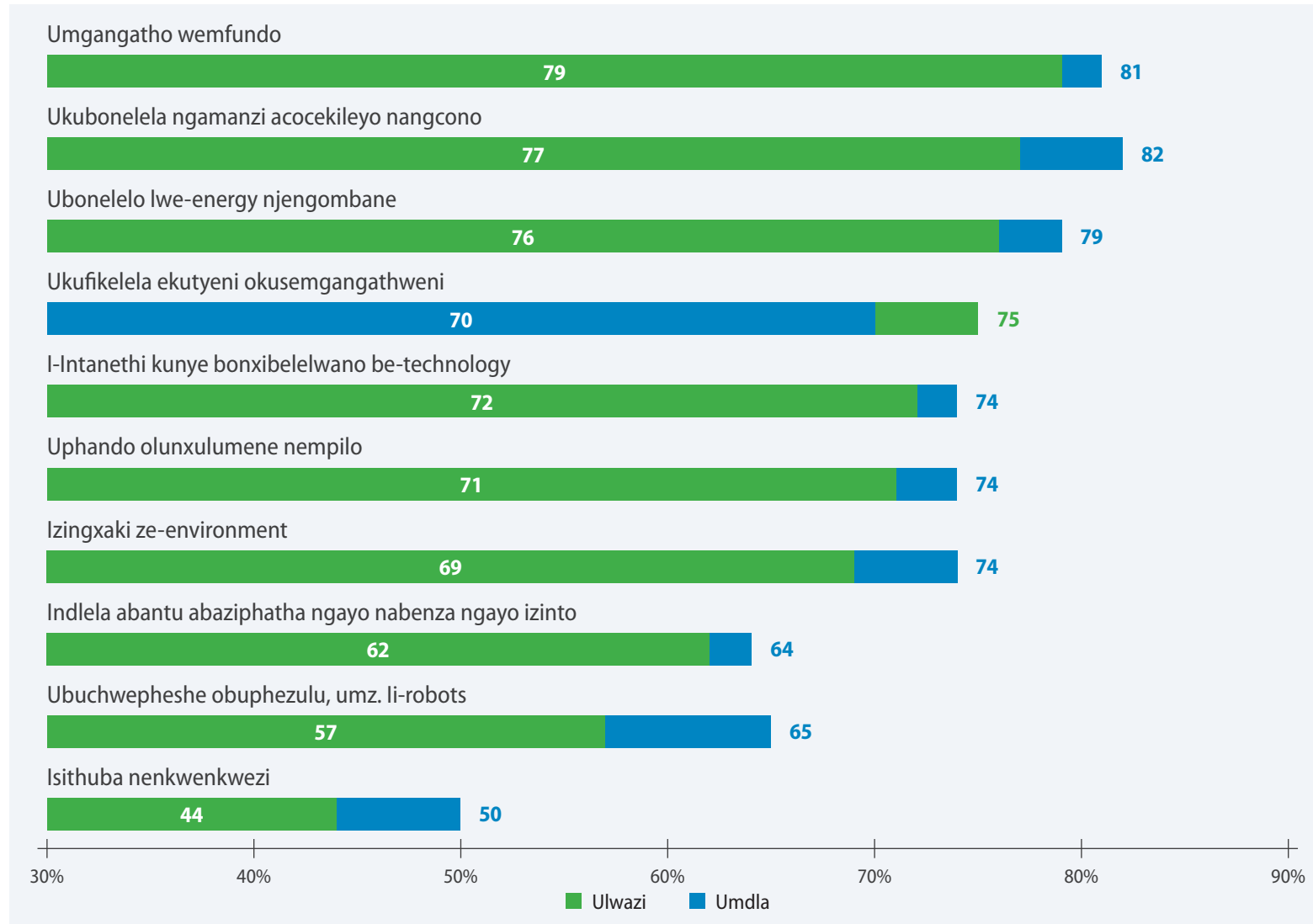
Ukwazisa, lwazi kunye nomdla kwi-S&T kubonisa kuveza ukuqonda ngobume bobudlelwane phakathi koluntu kunye nesayensi. *Ngomdla*, sithetha ukufuna ukwazi okungakumbi, ulwazi lubhekisela *kulwazi* osele unalo, ukwazisa kubonisa ukuba nolwazi, nangona kungeyomfuneko ukuba uqonde.

Uluntu luphendule ngokwahlukeneyo malunga namanqanaba omdla wabo, ulwazi, kunye nokwazisa nge-S&T. Lilonke, abemi boMzantsi Afrika bazi ngokufanelekileyo, banolwazi malunga kwaye banomdla kwi-S&T.



4.1 I-Percentage yabantu abadala abanolwazi oluncinane kunye nomdla kwindawo zesayensi ezibalulekileyo

Ukongeza, sivavanye ulwazi loluntu kunye nomdla kwimicelimngeni yoluntu yangoku efuna impendulo ye-S&T.



4.2 Amanqaku aphakathi olwazi kunye nomdla kwi-S&T, eboniswe kumaqela angaphantsi ahlukeneyo



Ngubani owayenolwazi oluphezulu kunye nomdla kwi-S&T?

Bekukho umahluko obanzi wamanqaku kuwo wonke amaqela angaphantsi, kunye namanqaku apahakthi olwazi lwesayensi ukusuka kuma\ku-46 ukuya kuma\ku-71 kwali-100, kunye nomdla kwisayensi ukusuka kuma\ku-53 ukuya kuma\ku-75 kwali\kwi-100.

Abo banolwazi oluphezulu lwesayensi kunye nomdla:

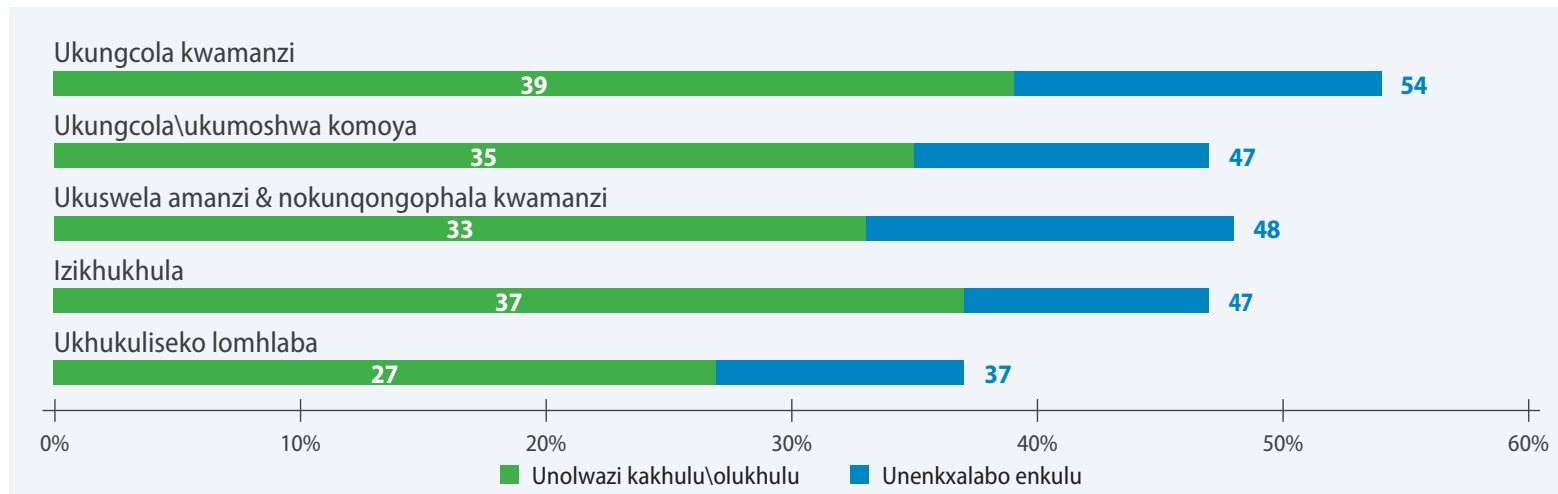
- bebebancinci,
- Ufumene imfundo yamabanga aphakamileyo,
- ndifumene inkxaso kwimfundo yasekhaya ephakamileyo, kunye
- bebephuma kumakhaya akumgangatho ophezulu wentlalo-qoqosho (SES).

Abantu abadala abaNhlophe nabamaNdiya/baseAsia babenolwazi oluphezulu lwe-S&T; ngelixa abantu abadala abaNhlophe, abaNnyama baseAfrika, nabamaNdiya/baseAsia babenomdla ophezulu.

5 Ulwazi loluntu kunye nenkxalabo malunga neziganeko zokusingqongileyo

Iimpembelelo zokutshintsha kwemozulu kunye neziganeko ezimbi zokusingqongileyo ziyinkxalabo yehlabathi neyoMzantsi Afrika. Abantu abadala abaninzi baxela ukuba 'babexhalabele kakhulu' ngezi ziganeko zokusingqongileyo kunokuba 'banolwazi' kakhulu ngeziganeko.

I-Percentage Labantu abadala 'abanolwazi oluninzi' kwaye 'babexhalabele kakhulu' ngeziganeko ze-environment



Aba-3 kubo bonke abantu abadala abaku-4

babenolwazi oluthile kunye nenkxalabo malunga neziganeko zendalo



ULWAZI OLUPHAKAMILEYO NENKATHAZO

Iziganeko Ze-environment

47%
Inkxalabo

34%
Ulwazi



Impawu zabo banolwazi oluphezulu kunye nenkxalabo malunga neziganeko ze-environment

- Amanqaku angumndilili, ngokweqela elingaphantsi, abephakathi kwama-56 nama-74 (ku-100) olwazi lwendalo\nge-environment, naphakathi kwama-62 nama-83 enkxalabo ngendalo\nge-environment.
- Abantu abadala ababenolwazi oluthe vetshe kwaye bexhalabele iziganeko zendalo\ze-environment:
 - ndibenemfundo yasemva\engaphambi kwamabanga aphakamileyo, namava enkxaso kwimfundo yasekhaya ephakamileyo,
 - babephuma kumakhaya e-SES atyebileyo kwaye
 - behlala ezidolophini ezisesikweni nezisemaphandleni.
- Abantu abadala abamhlophe nabase-Indiya/base-Asia babenolwazi oluphezulu malunga neziganeko zendalo\ze-environment ngelixa abantu abadala abamhlophe, abanyama base-Afrika, nabamandiya/base-Asia babenenkxalabo ephezulu malunga neziganeko zokusingqongileyo.

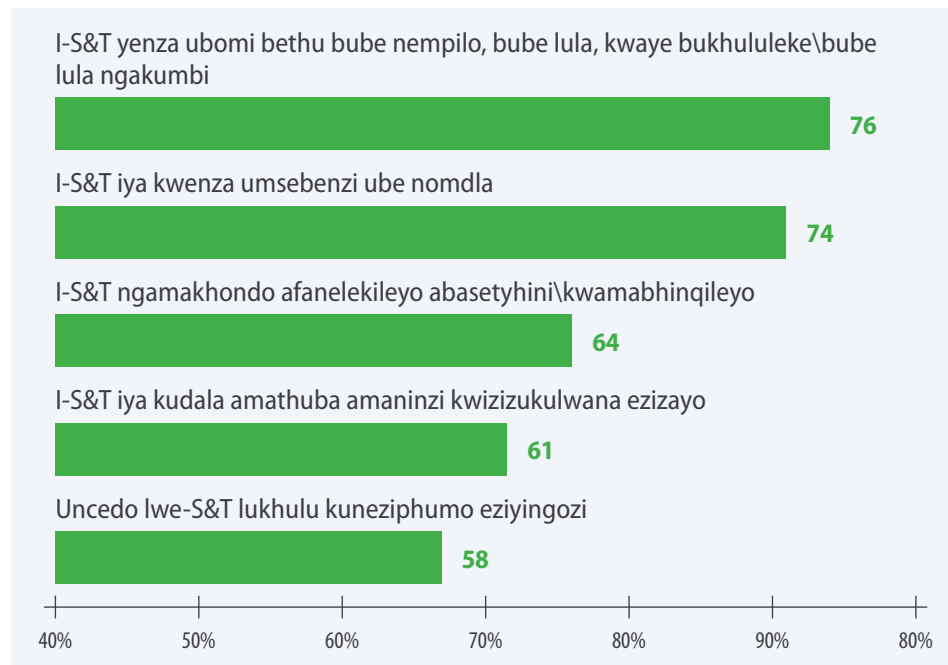
6 Isithembiso kunye nesimo sengqondo se-reservation malunga kwisimanje kunye nendlela ye-S&T eqhele ukusetyenziswa

Uluntu luphendule kwii-set zezinto ezibuza ngezimo zabo zesithembiso (iinzuzo ezinokwenzeka) kunye nogcino (iinkxalabo, uloyiko, kunye neengozi) ezinxulumene nesayensi yanamhlanje neyemveli. Uluntu lwaseMzantsi Afrika luzivumile zombini izithembiso kunye neenkxalabo malunga ne-S&T.

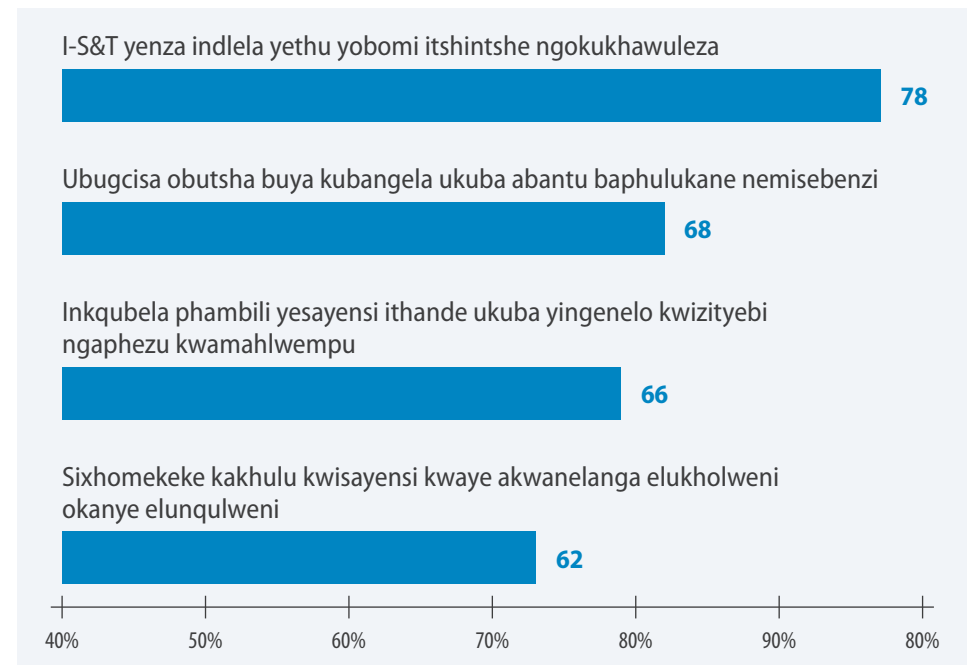
6.1 Isithembiso kunye nendlela yokucinga ye-reservation malunga ne-S&T yesimanje

Iinzuzo ezinkulu ezinokuthi zixelwe zazinxulumene ne-S&T yenza ubomi bemihla ngemihla bube nempilo, bube lula, bukhululeke kwaye benze umsebenzi ube nomdla ngakumbi; ngelixa inkxalabo enkulu ephawulweyo yayimalunga ne-S&T yenza indlela yethu yobomi itshintshe ngokukhawuleza kwaye ifake isandla ekwandeni kokungalingani.

Isithembiso sesayensi yanamhlanje (% isivumelwano)



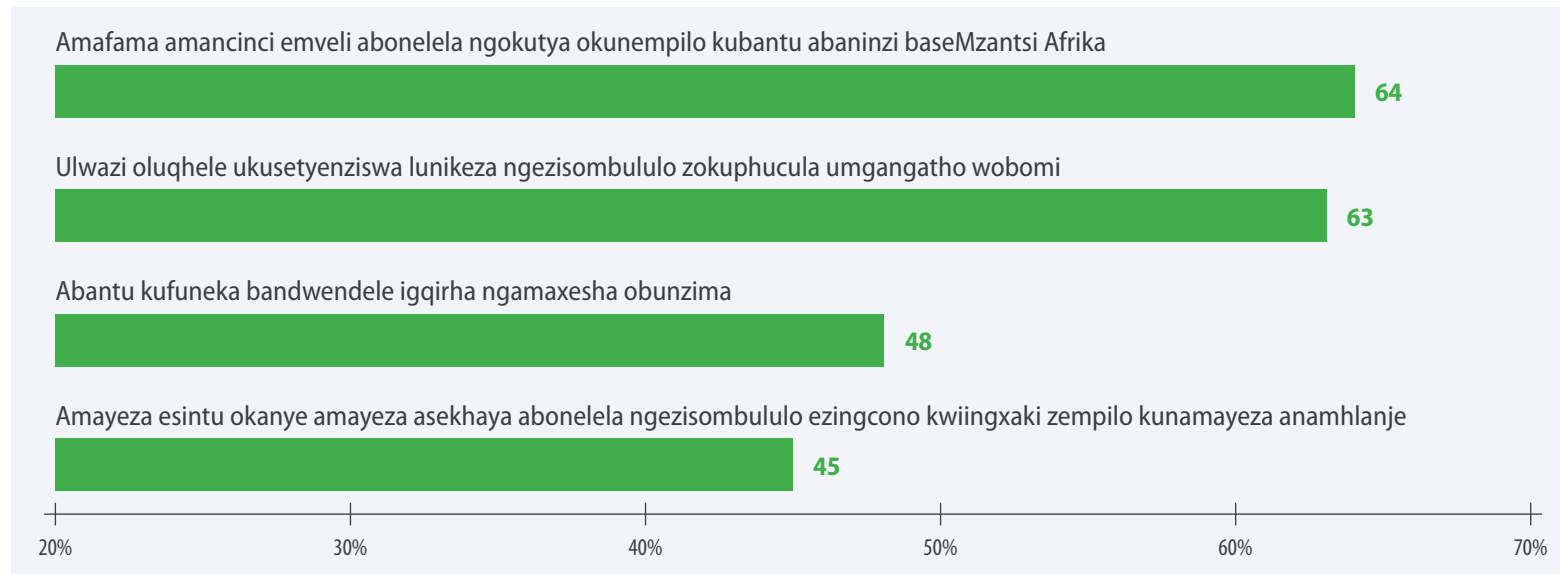
Ugcino malunga nesayensi yanamhlanje (% isivumelwano)



6.2 Isithembiso kunye nendlela yokucinga ye-reservation malunga nendlela ye-S&T eqhele ukusetyenziswa

Isayensi eqhele ukusetyenziswa yemveli ibhekisa kulwazi nezakhono eziye zadluliselwa kwizizukulwana ngezizukulwana kuluntu.

Isithembiso senzukulwazi yemveli (% isivumelwano)



Zi-2 kubo bonke abantu abadala aba-3

baye bavuma izibonelelo zokulima kwamasiko amancinci kunye nolwazi lwemveli kwimveliso yokutya

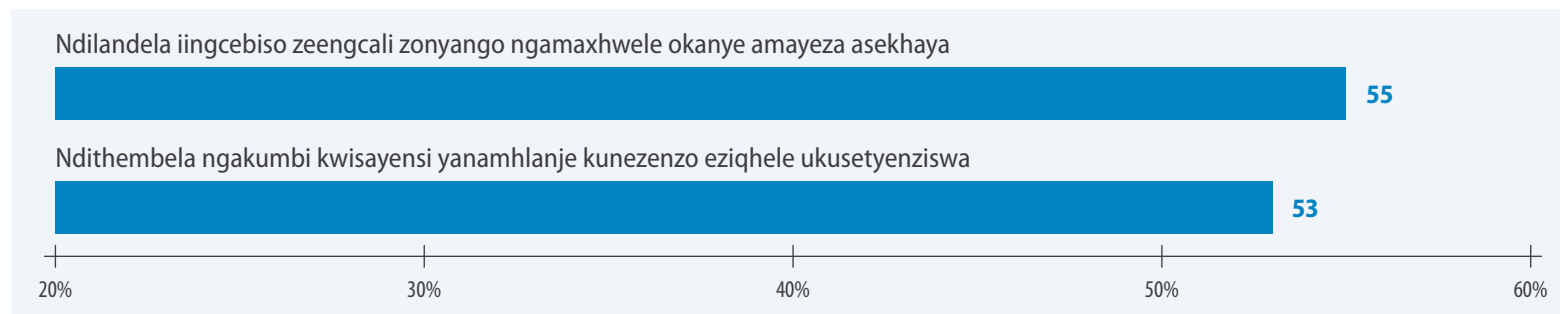


Abantu aba-5 kwaba-10

kubantu abadala baye baqaphela indima yamakhwele namayeza esintu

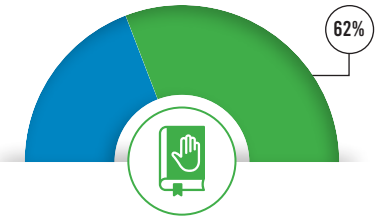
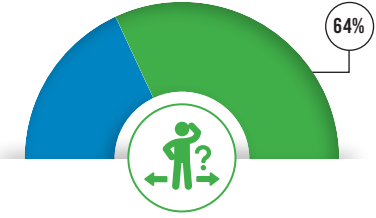
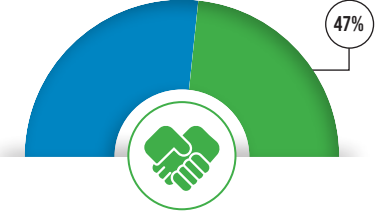


Ugcino\ii-reservations malunga nesayensi yemveli ngo-2022 (% isivumelwano)



6.3 Ukusasazwa kwesithembise kunye nendlela yokicinga ye-reservation kwaye ngobani ababe nesimo sengqondo esiphezulu nge-reservation

Kwakukho izithembiso eziphezulu kunye nezimo zengqondo zocino malunga nesayensi yanamhlanje kusayensi eqhele ukusetyenziswa. Ukongeza, bekukho ukuhluka okuncinci phakathi kwezithembiso zoluntu kunye nezimo zengqondo zocino\zee-reservations (njengoko kuboniswa ngumahluko phakathi kwamanqaku aphezulu kunye nawona aphantsi ngamaqela angaphantsi) ngokumalunga nesayensi yanamhlanje kunesayensi eqhele ukusetyenziswa.





	I-Percent Labantu abadala abasimo senqondo esingaphezulu	Amanqaku aphezulu kakhulu kunye naphantsi (kunye nomahluko)	Ngobani ababenokuthi banike ingxelo ephezulu ngesithembise kunye nendlela yokicinga nge-reservation?
Isithembiso malunga nesayensi yamanje		62 kuya 72 = 10 amanqaku	Abantu abadala abangaphezulu kwemfundo yamabanga aphantsi, imfundo yasekhaya ephezulu inkxaso, kwaye ababengabafundi okanye abafundi babeneendlela zokuziphatha eziphezulu yesithembiso.
Ii-Reservation Malunga nesayensi yamanje\yesimanje		64 kuya 76 = 12 amanqaku	Abantu abadala abangaphezulu kwemfundo yamabanga aphantsi, imfundo yasekhaya ephezulu inkxaso, abalutsha, kunye ama-Black Africans kunye Indian/Asia abadala abadala babe izimo zengqondo eziphezulu ze-reservations.
Isithembiso malunga nesayensi eziqhele ukusetyenziswa		49 kuya 70 = 21 amanqaku	Abantu abadala abafumana imfundo ephantsi, abavela kumakhaya ahluphekayo, Abantu abadala abaNtsundu baseAfrika kunye nabo bathetha isiTshivenda, isiZulu, nesiTsonga baveze isithembiso esiphezulu se-S&T eqhele ukusetyenziswa.

6.4 Indlela zesithembiso kunye nendlela zokucinga malunga ne-reservation ngokuhamba kwexesha



Kwizinto ezifakwe kuphando lwangaphambili, siqhathanise iziphumo kunye novavanyo lweSAPRS 2022. Ngokubanzi, iziphumo zibonise ukonyuka kwezimo zesithembiso kunye ne-reservations ngokuhamba kwexesha kwisayensi yanamhlanje\ yesimanje, kodwa ukwehla kwesithembiso kunye nezimo zengqondo zokubekela bucala kwisayensi eqhele ukusetyenziswa.

Utshintsho olukhulu lwaluyimbono yoluntu yokunyuka kokungalingani kunye neempendulo kwingxelo ethi 'Inkqubela phambili yesayensi idla ngokuzuzisa izityebi ngaphezu kwamahlwempu\abantu abahluphekile' ukwandisa ipesenti ngamanqaku angama-17. Kubekho ukuhla okuphawulekayo kumlinganiselo woluntu oluvumileyo ukuba i-S&T iya kudala amathuba amaninzi kwizizukulwana ezizayo. Nangokuba kuyonwabisa ukuqaphela ukuba uninzi loluntu ngoku luthembele kakhulu kwisayensi yanamhlanje\yesimanje kunye nezithethe kunye nenkcubeko, kukho inkxalabo yokuba imbono yesithembiso kumafama amancinci, yehlile.

QAPHELA\NB: Izinto ezinombala oluhlaza zinike ingxelo yokwanda okukhulu kwamanani ukusuka ku-2013 ukuya ku-2022, izinto ezinombala o-yellow azibanga nalutshintsho lubalulekileyo ngamanani, kwaye ezinombala o-orangezinike ingxelo yokuhla ngokwamanani.

Isayensi yangoku: Tshintsho ukusuka ku-2013 ukuya ku-2022 (Amanqaku epesenti)		
Inkqubela phambili isayensi ithande ukuba yingenelo kwizityebi ngaphezu kwabantu abahluphekile (R)		+17***
Sixhomekeke kakhulu kwisayensi kwaye akwanelanga elukholweni okanye kwinkolo (R)		+7***
I-S&T yenza indlela yethu yobomi itshintshe ngokukhawuleza (R)		+5***
Uncedo lwe-S&T lukhulu kuneziphumo eziyingozi (P)		+9***
I-S&T iya kwenza umsebenzi ube nomdla ngakumbi (P)		+7***
I-S&T yenza ubomi bethu bube nempilo, bube lula, kwaye bukhululeke ngakumbi (P)		0
I-S&T ngamakhondo afanelekileyo abasetyhini (P)		-2
I-S&T iya kudala amathuba amaninzi ezizukulwana ezizayo (P)		-11***

Amanqaku\li-notes: *** okubalulekileyo ngokwezibalo kwi-p<.001

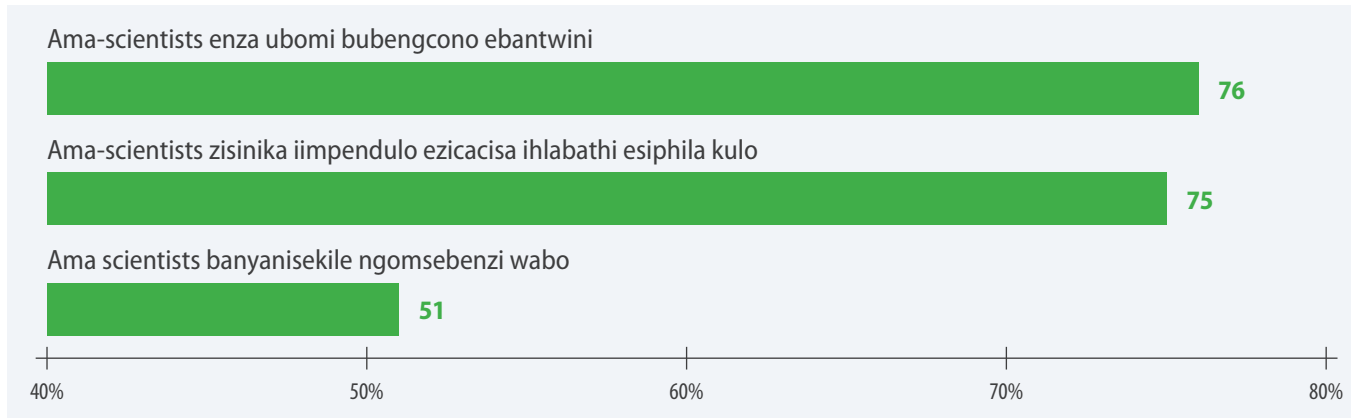
Isayensi yesiNtu: Tshintsho ukusuka ku-2009 ukuya ku-2022 (Amanqaku epesenti)		
Amafama amancinane emveli abonelela ngokutya okunempilo kubemi baseMzantsi Afrika (P)		-7***
Ndithembela ngakumbi kwisayensi yangoku kunezenzo zemveli nezenkcubeko (R)		-18***

Amanqaku\li-notes: *** okubalulekileyo ngokwezibalo kwi-p<.001

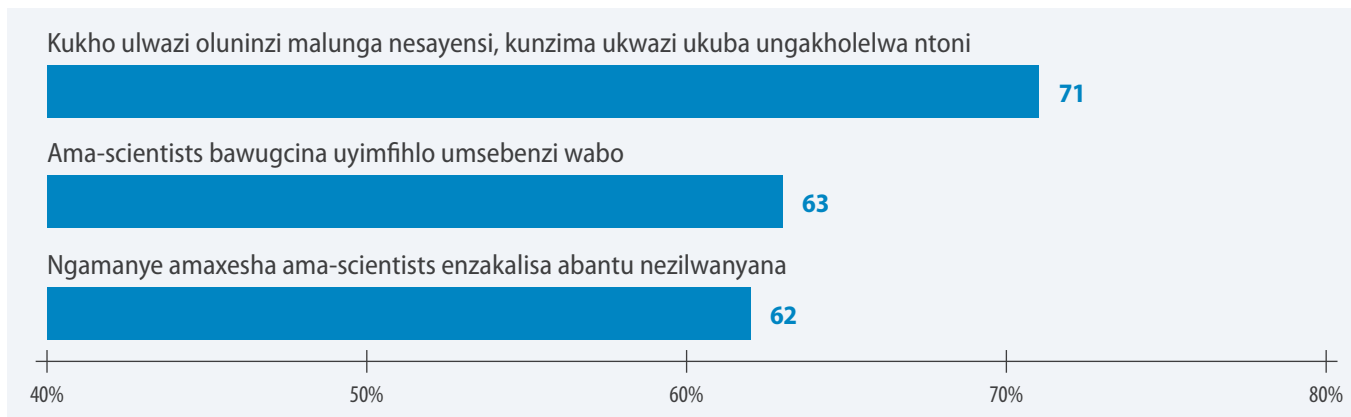
7

Ukuthembela koluntu kumsebenzi wesayensi kunye nolwazi lwezesayensi kumaziko

Isithembiso somsebenzi weenzululwazi (% isivumelwano)



Ugcino\ii-reservation malunga nomsebenzi weenzululwazi (% isivumelwano)



Isayensi kunye nama-scientists zibonelela ngolwazi olusekelwe kubungqina kunye neengcebiso malunga nendlela yokusombulula iingxaki zoluntu. Ukuze ingcebiso yamkelwe, uluntu kufuneka luthembe isayensi kunye nama-scientists, kwaye luthembele kumaziko avelisa ulwazi olunjalo.

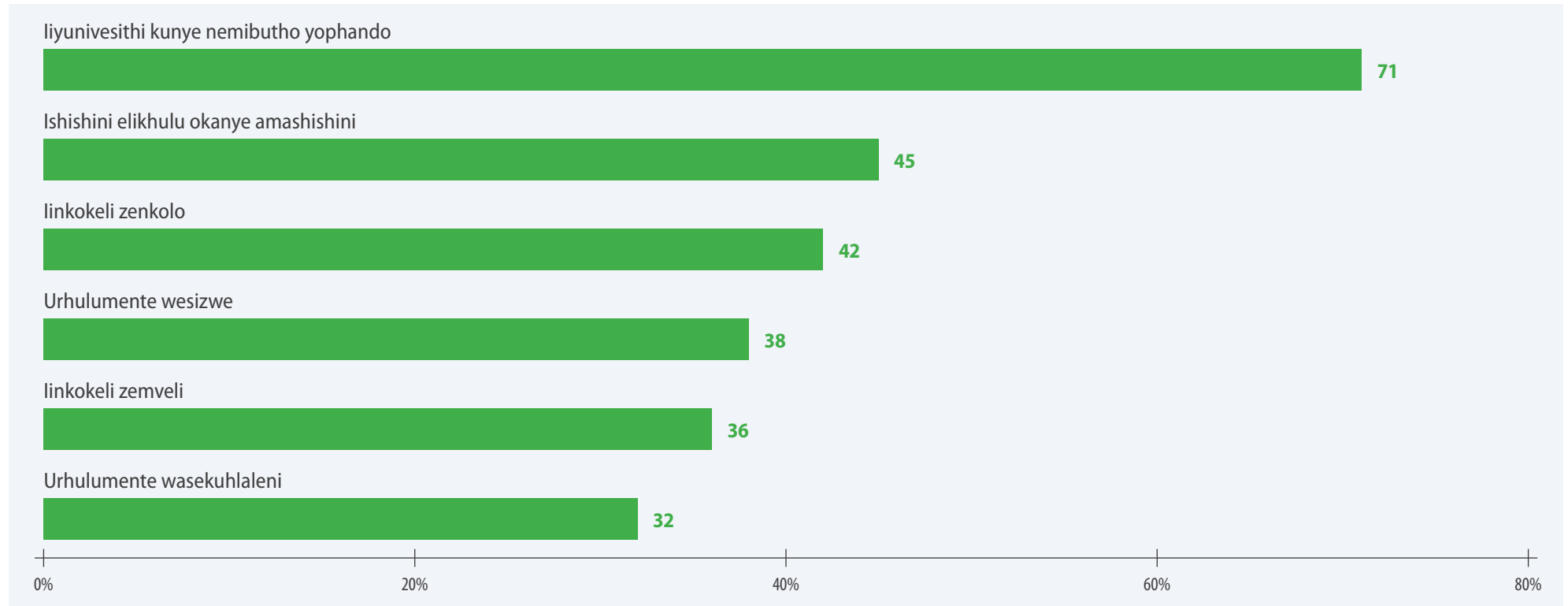


I-7 kubo bonke abantu abadala be-10

bathembela umsebenzi wazi-scientista, kunye nolwazi lwe-S&T olunikezwa ziiyunivesithi kunye nemibutho yophando

Kwangaxeshanye, nangona kunjalo, ipesenti ephezulu yoluntu yayinokungabaza malunga nomsebenzi wezi-scientists kunye nokuthembela okuphantsi kwe-S&T ulwazi oluvela kwiinkokeli zonqulo kunye namaziko karhulumente (jonga kwiphepha elilandelayo).

Ukuzithemba kwiinkcukacha ze-S&T ezivela kumaziko ahlukeneyo (% isivumelwano)



Ngobani ababenokuthembela okuphezulu kii-scientists kunye nolwazi lwe-S&T oluvela kwiiyunivesithi kunye nemibutho yophando?

Uluntu lube neembono ezifanayo, kungajongwanga iyantlukwano ngokwentlalo-nabantu, ekuthembeni kwabo kumsebenzi we-scientists kunye nokuthembela kulwazi lwe-S&T oluvela kwii-yunivesithi kunye nemibutho yophando.

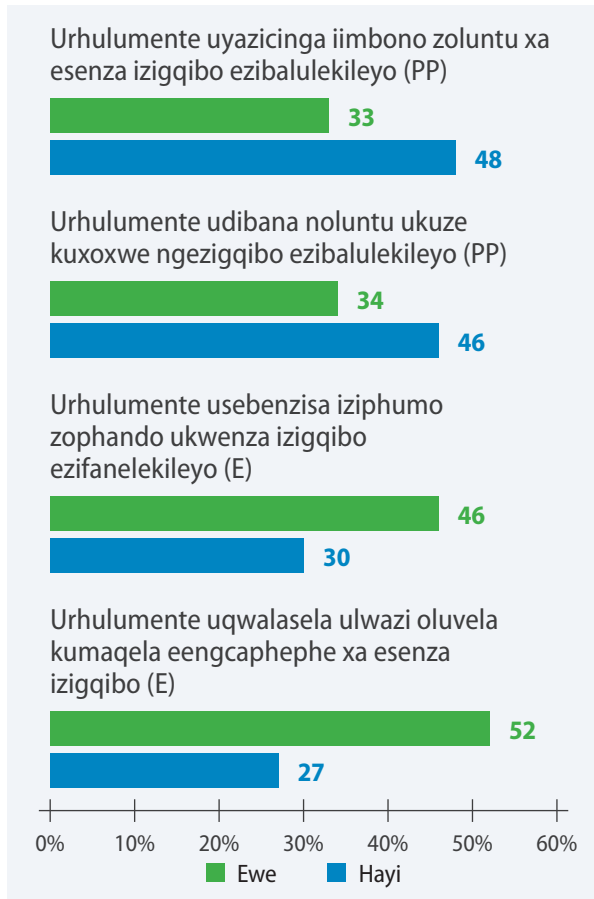
Abo babethembela kakhulu kwi-scientists nakwi-S&T ulwazi oluvela kwii-yunivesithi kunye nemibutho yophando yayi:

- abantu abadala abanemfundo ephakamileyo,
- abantu abadala abanenkxaso yasekhaya kwimfundo,
- abancinci\abatsha, kunye
- abafundi abakwi nqanaba eliphezulu kunye nabafundi.

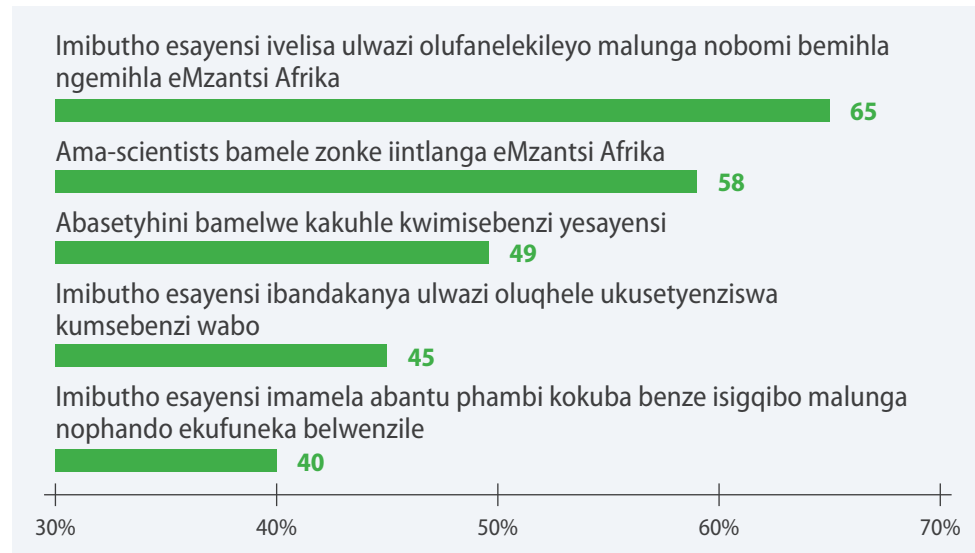
8

Ukuzithemba koluntu kwinkqubo zokuthatha izigqibo ngurhulumente kunye nokuguqulwa kweenkcubeko kwimibutho yesayensi

Ukuzithemba kwiinkqubo zikarhulumente ezisekelwe kubungqina (E) kunye nokuthatha inxaxheba kwezigqibo (PP) (% isivumelwano kunye nokungavumelani)



Linkcubeko phakathi kwemibutho yesayensi iyatshintsha (% isivumelwano)



I-3 kubantu abadala kuba-10

bachaze ukuthembela okuphezulu kwiinkqubo zokwenziwa kwezigqibo zikarhulumente



I-4 kubo bonke abantu abadala be-10

bavumile ukuba iinkcubeko kwimibutho yesayensi ziyaguquka



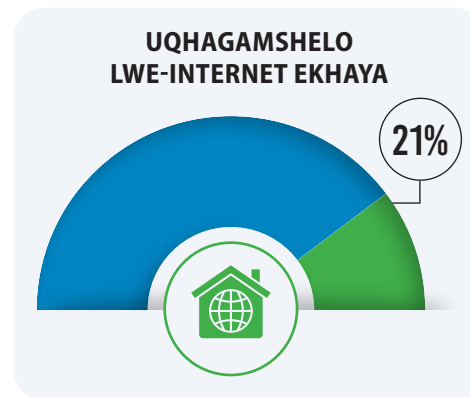
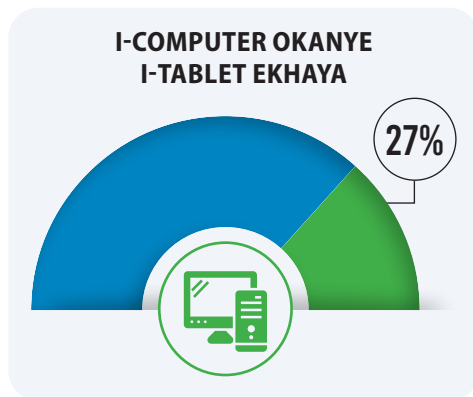
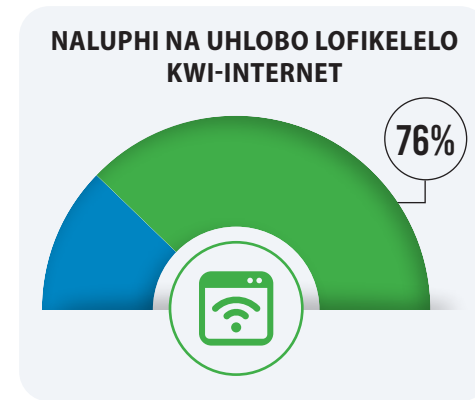
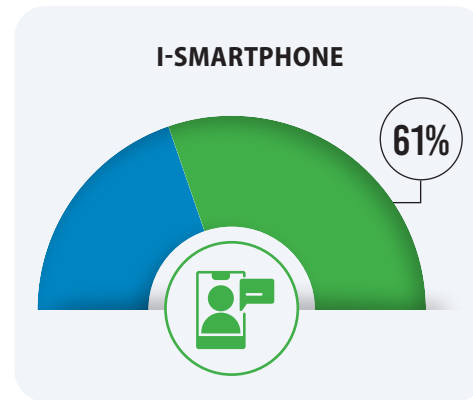
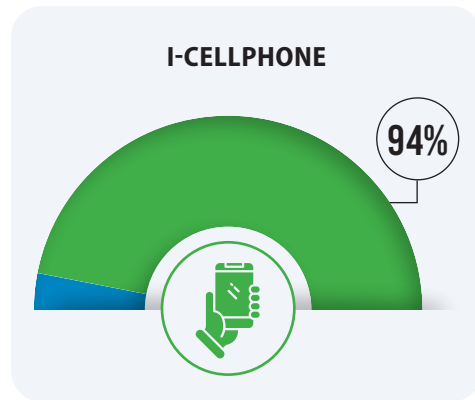
- Kwakukho ukuzithemba okuphantsi kwiinkqubo zokwenziwa kwezigqibo zikarhulumente kunye nokuguqulwa kweenkcubeko kwimibutho yesayensi.
- Umahluko phakathi kwawona manqaku aphezulu nawona aphantsi, liqela elincinane, ekuthembekeni kwiinkqubo zokwenziwa kwezigqibo zikarhulumente yayili-11 lamanqaku amancinci; nangoko, umahluko kwisivumelwano ukuba iinkcubeko kumaziko esayensi ziguquka yayincinci ngama manqaku angama-8.
- Abantu baseMzantsi Afrika bathatha iimbono ezifanayo malunga nokwenziwa kwezigqibo ngurhulumente kunye nokuguqulwa kweenkcubeko kwiindawo zokusebenza zesayensi, kungakhathaliseki ukuba banemvelaphi eyahlukileyo.
- Abantu abadala abaNtsundu baseAfrika babenentembelo ephezulu kwiinkqubo zokwenziwa kwezigqibo zikarhulumente kunye nemvumelwano ephezulu malunga notshintsho lweenkcubeko kwimibutho isayensi.

9 Ulwazi lwe-S&T: Ukufikelela, i-exposure, ukuvezwa,

kunye nokuthembela

Ubudlelwane obuhle phakathi kwesayensi kunye noluntu luxhomekeke ekwabelaneni ngolwazi lwe-S&T kunye nokuqinisekisa ukuba uluntu lunako ukufikelela kwaye luthembe olu lwazi. Ukufikelela koluntu kwizixhobo ze-digital kunye ne-intanethi idlala indima ebalulekileyo ekubavumela ukuba bafikelele kulwazi.

Ngo-2022, olu fikelelo lwe-digital kunye ne-intanethi lube ngolu hlobo lulandelayo:



Abantu aba-3 kwaba-4
bebenokufikelela kwi-intanethi



I-6 kubantu abali-10
babene-smartphone



9.1 Ii-Patterns zokifikelela kunye nokusebenzisa intanethi

Um-1 kubantu abadala aba-4



babengenayo i-internet

Um-1 kubantu abadala aban-3



basebenzisa i-internet rhoqo (ngaphezulu kweeyure ezine iintsuku ezininzi)

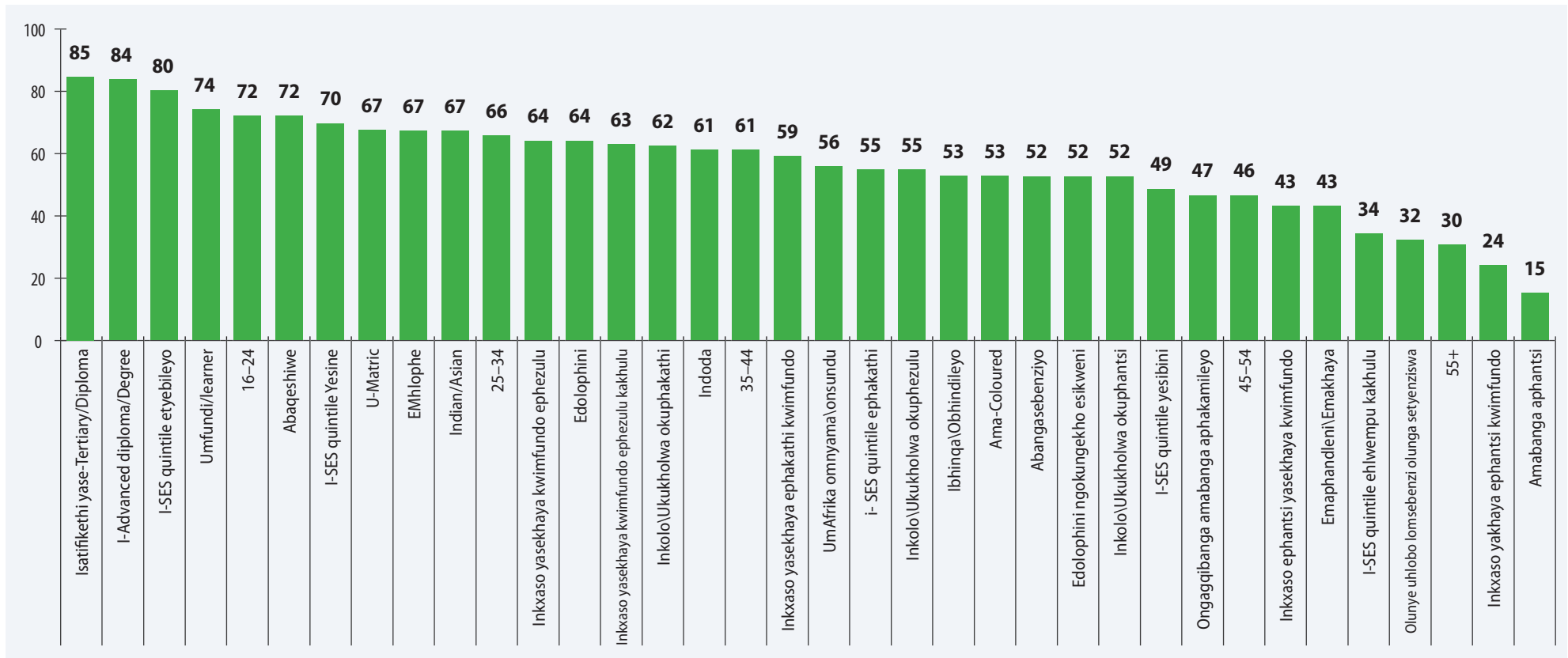
Ukusetyenziswa kwe-intanethi imihla ngemihla kwahluka ngokubanzi, ukusuka kwi-85% ephezulu kwabo banemfundo ephakamileyo ukuya kwi-15% ephantsi kwabo banemfundo yamabanga aphantsi kuphela.

Ngubani osebenzise i-intanethi ephezulu?

Abo babesebenzisa i-intanethi ephezulu babe:

- abantu abadala abaphumelele
- abafundi bezinga eliphakamileyo, abafundi, i-matric nangaphezulu, kunye nenkxaso yasekhaya kwimfundo ephakamileyo,
- omncinci\abatsha,
- abafundi bezinga eliphakamileyo, abafundi, nabaqeshiweyo,
- ukusuka kumakhaya atyebileyo e-SES, kunye
- Abantu abadala abamhlophe kunye namandiya/ama-Asian.

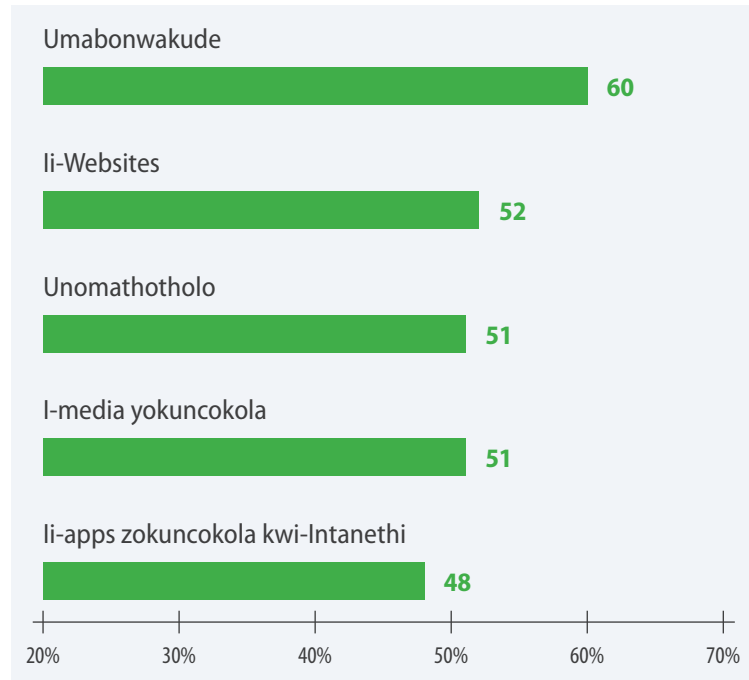
Ii-The pattern zokusetyenziswa kwe-internet ngemihla ngokweempawu zentalo yabantu (%)



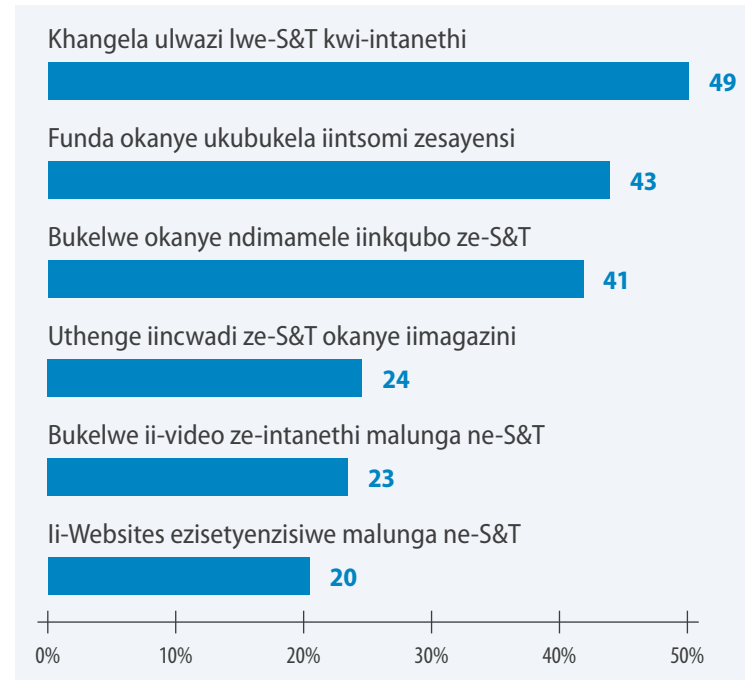
9.2 Ukuvezwa kunye nokusetyenziswa kolwazi lwe-S&T

Ulwazi lubalulekile ekwenziweni kwezigqibo kwaye lunokuthi emva koko lube lucaphazele iintshukumo nakwindlela yokuziphatha. Uluntu luxele ukuba luvezwe (ukufumana) kunye nokutya (ukufikelela ngokusebenzayo) izixa eziphantsi zolwazi lwe-S&T.

Eyona mithombo idumileyo yeendaba ze-S&T (% ubuncinci ngeveki)



Uninzi lweendlela ezidumileyo zolwazi lwe-S&T lwasetyenziswa (% noko ngamanye amaxesha)



I-2 kubo bonke abantu abadala be-10

bafumana izixa eziphezulu zolwazi lwe-S&T



I-1 kubo bonke abantu abadala be-20

basebenzise izixa eziphezulu zolwazi lwe-S&T



**OWONA UMTHOMBO
WOLWAZI LWE-S&T
OLUSETYENZISWA KAKHULU**
Umabonwakude

60%



**EYONA INDELELA ESETYENZISWA
KAKHULU YOKUFIKELELA
NGOKUSEMNENE KULWAZI
LWE-S&T**

Uphendlo lwe-Intanethi

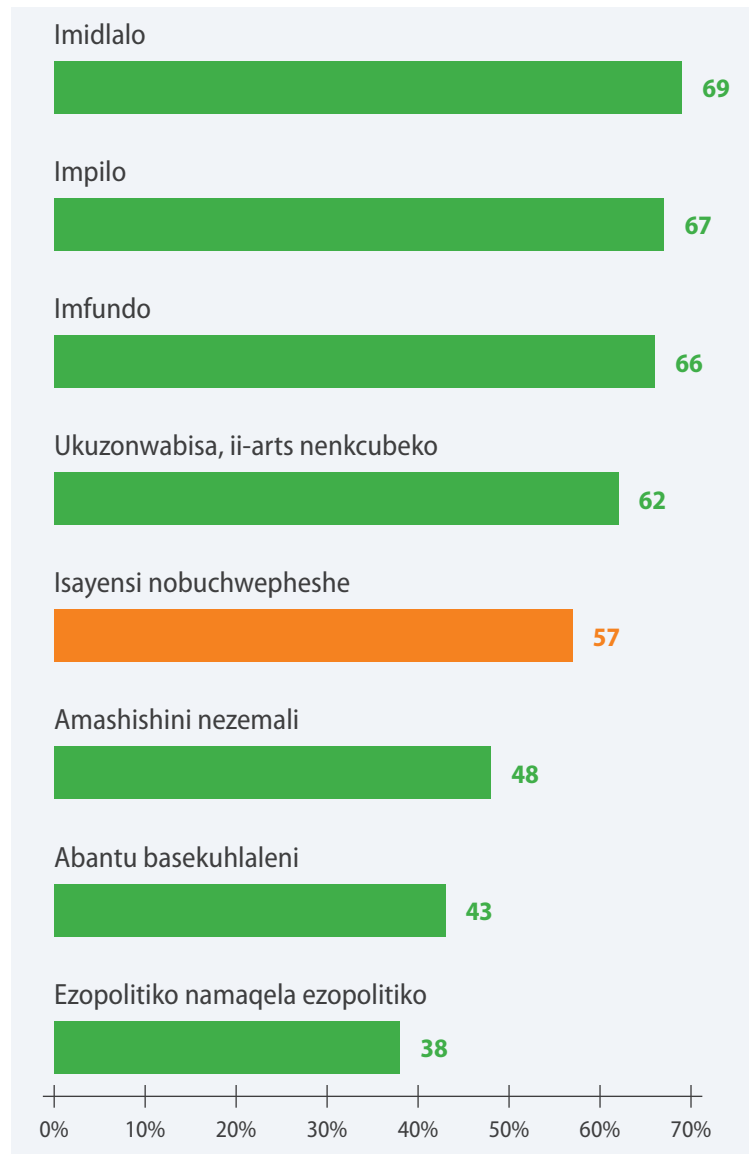
49%



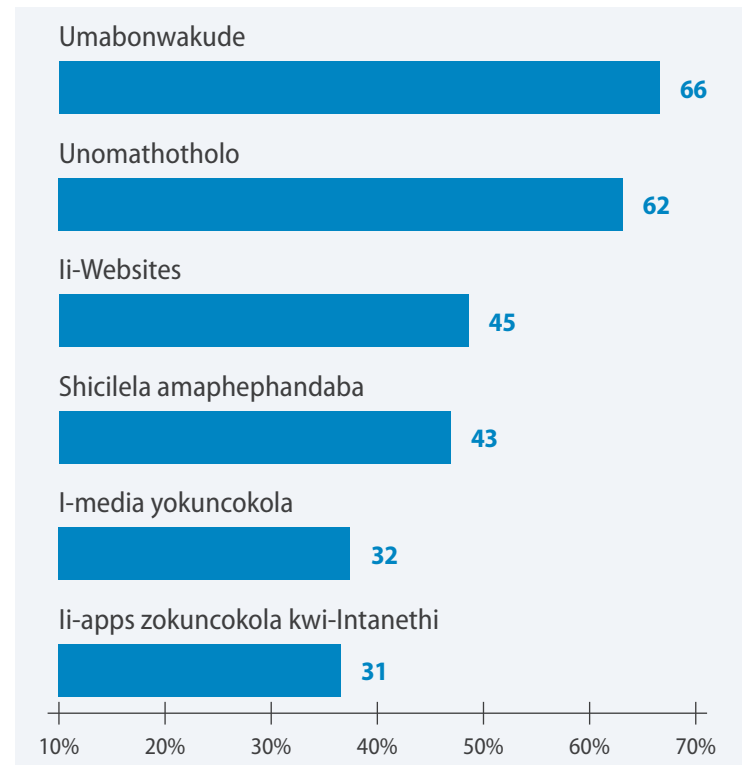
- Bekukho umahluko obanzi wamanqaku okuvezwa kunye nokusetyenziswa kolwazi lwe-S&T liqela elingaphantsi, kunye namanqaku aphakathi kwama-22 ukuya kuma-51 kwali-100 okuvezwa kulwazi, kunye nama-27 ukuya kuma-47 okusetyenziswa kolwazi.
- Abo baye bachanabeka, kwaye basetyenziswa, ulwazi oluninzi lwe-S&T:
 - ubenemfundo ephakamileyo
 - babenenkxaso yasekhaya kwiimfundo ephakamileyo, kunye
 - babebancinci, abafundi bezinga eliphakemileyo kunye nabafundi

9.3 Ukuthembela kwi-umxholo yezindaba kunye nemithombo yolwazi

Thembela kwisiqulatho seendaba (%)



Ukuthembela kwimithombo yolwazi ye-S&T (%)



- Nokuba baneemvelaphi ezahlukeneyo, abemi boMzantsi Afrika bathande ukuba namanqanaba afanayo okuthemba kwimithombo yeendaba ye-S&T.
- Abo babethembela kakhulu kwimithombo yeendaba ye-S&T yayingabantu abadala abanemfundo ethe vetshe, inkxaso yasekhaya yemfundo ephakamileyo, kunye nabo babebancinci, abafundi bamazinga aphezulu, abafundi, kunye nabangaphangeliyo.

I-6 kubo bonke abantu abadala be-10

banelisekile yindlela i-media ebika ngayo iindaba ze-S&T



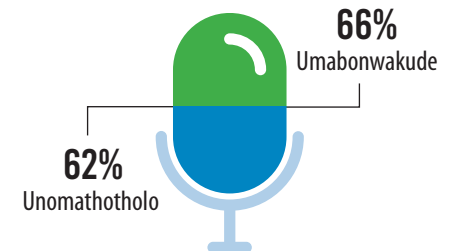
ELONA NQANABA ELIPHAKAMILEYO LOKUTHEMBA KUMXHOLO WEENDABA
Ezemidlalo

69%



EYONA MITHOMBO YOLWAZI ESITHEMBEKILEYO YE-S&T

Umabonakude kunye nonomathotholo



10 Iziphumo zokuzibandakanya zesayensi: Izinto zokwenza kunye nokuziphatha

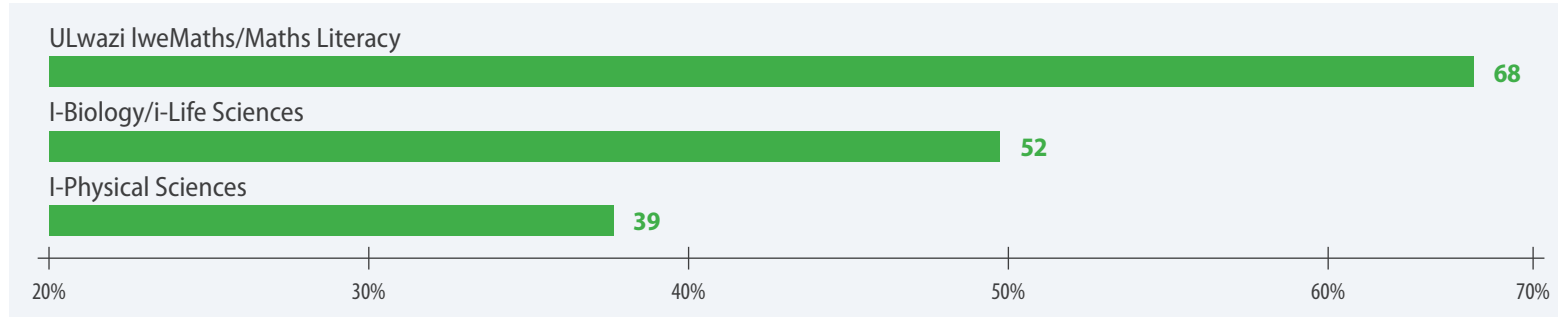
Abaphenduli kuphando babuzwa ukuba ingaba bathathe inxaxheba na kwimisebenzi eyahlukeneyo malunga ne-S&T okanye, njengoko ukwenza oko kusebenza njengembonakalo yokuzibandakanya kwabo kwisayensi. Imisebenzi okanye ii-events yahlulahlulwe yaziintlobo ezintlanu ezibanzi zokuzibandakanya: ukuzibandakanya kwezemfundo, ukuzibandakanya olusekwe kumtsalane, ukuzibandakanya olusekwe kuluntu, ukuzibandakanya lokwabelana ngolwazi, kunye nokuzibandakanya komntu kunye neeapps ze-intanethi.



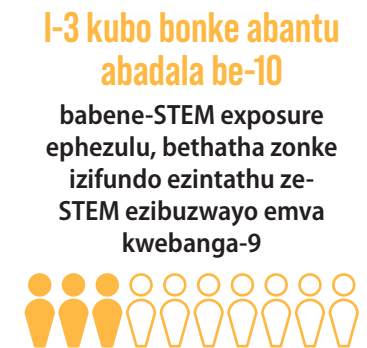
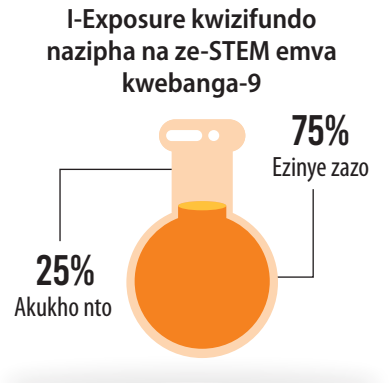
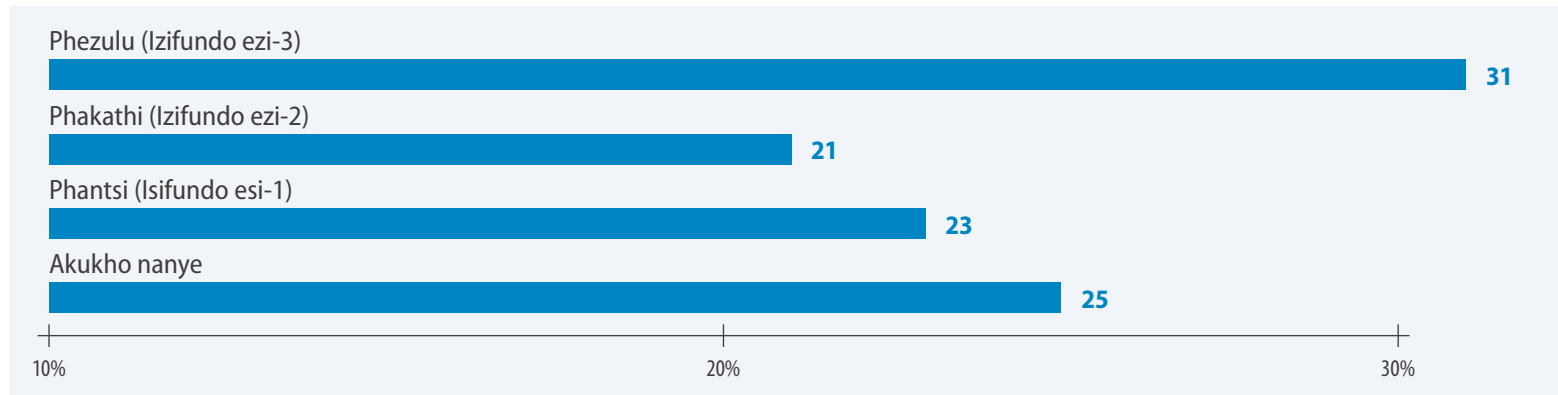
10.1 Ukuzibandakanya nezifundo: Inqanaba lokufikelela kwizifundo zeSTEM esikolweni

Ulwazi lwezesayensi kunye nezimo zengqondo malunga nesayensi zinxibelelene. Abaphenduli kwisaveyi yeSAPRS banike ingxelo ngezifundo zeSTEM ababezikhethela ukuba bazifundele esikolweni kwibanga lesi-9.

Ukuboniswa kwizifundo zeSTEM emva kwebanga-9 (%)



I-Index yokuboniswa\ukubona ze-STEM (%)







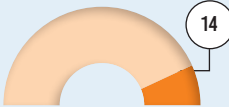










Abo banokuvezwa okuphezulu kwe-STEM:

- babenamanqanaba aphezulu okuphumelela kwimfundo kunye nenkxaso yasekhaya kwimfundo ephakamileyo;
- baphuma kumakhaya aphezulu e-SES,
- bebebancinci, abafundi bamazinga aphakamileyo, abafundi, nabaqeshwayo, kunye
- kungenzeka ukuba ngabantu abadala abaMhlophe.

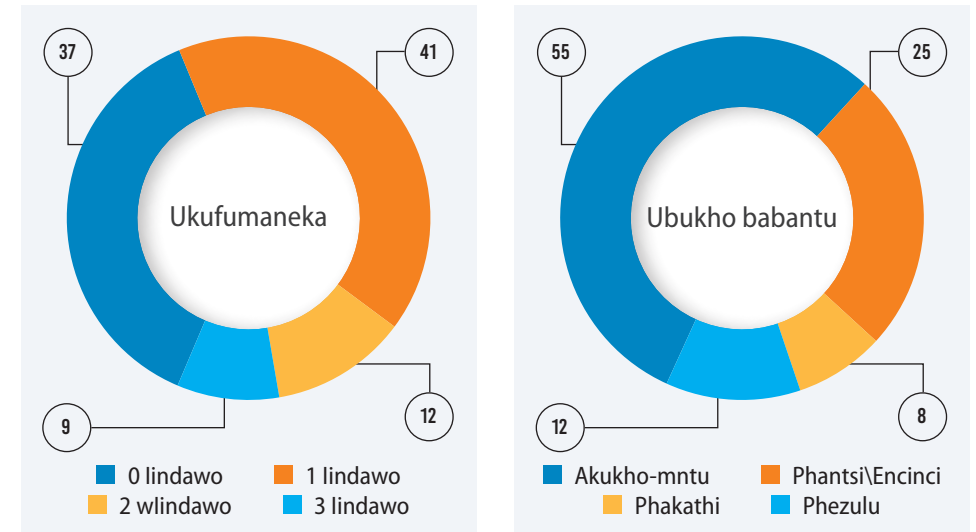
10.2 Ukuzibandakanya malunga nokutsala: Ukufumaneka kunye nobukho kwiindawo ze-S&T

Abaphenduli be-survet ye-SAPRS banike ingxelo malunga nokufumaneka kwezindawo ze-S&T kunye nemisebenzi kwiindawo zabo nokuba bakhe bazindwendwela na. Ngaphezulu nje kwesinye kwisithathu soluntu (37%) babengenazo izindawo ze-S&T, ezifana namathala eencwadi, ii-museum okanye amaziko e-S&T kufutshane namakhaya abo, nangoko ngaphezulu kwesiqingatha (55%) bengakhange baye kwiindawo ze-S&T okanye imigidi\imicimbi.

Ubukho kunye nokuya kwiindawo ze-S&T kunye nemisebenzi\izinto zokwenza (%)

	Iindawo ze-S&T kunye nemisebenzi\izinto zokwenza	Ekhoyo kwiindawo	Ubukho babantu
	Ithala lencwadi loluntu	 55	 30
	Izinto zokwenza uluntu zesayensi, umz\le.g. ukucoca, ukuhamba kwendalo	 14	 18
	Ii-Museum	 12	 23
	Isitiya sezityalo, indalo okanye ulondolozo lwezilwanyana, i-zoo, i-aquarium	 10	 26
	Iziko lesayensi ne-technology okanye umboniso	 7	 16

Ubukho kunye nokuya kwiindawo ze-S&T kunye nemisebenzi\izinto zokwenza (%)

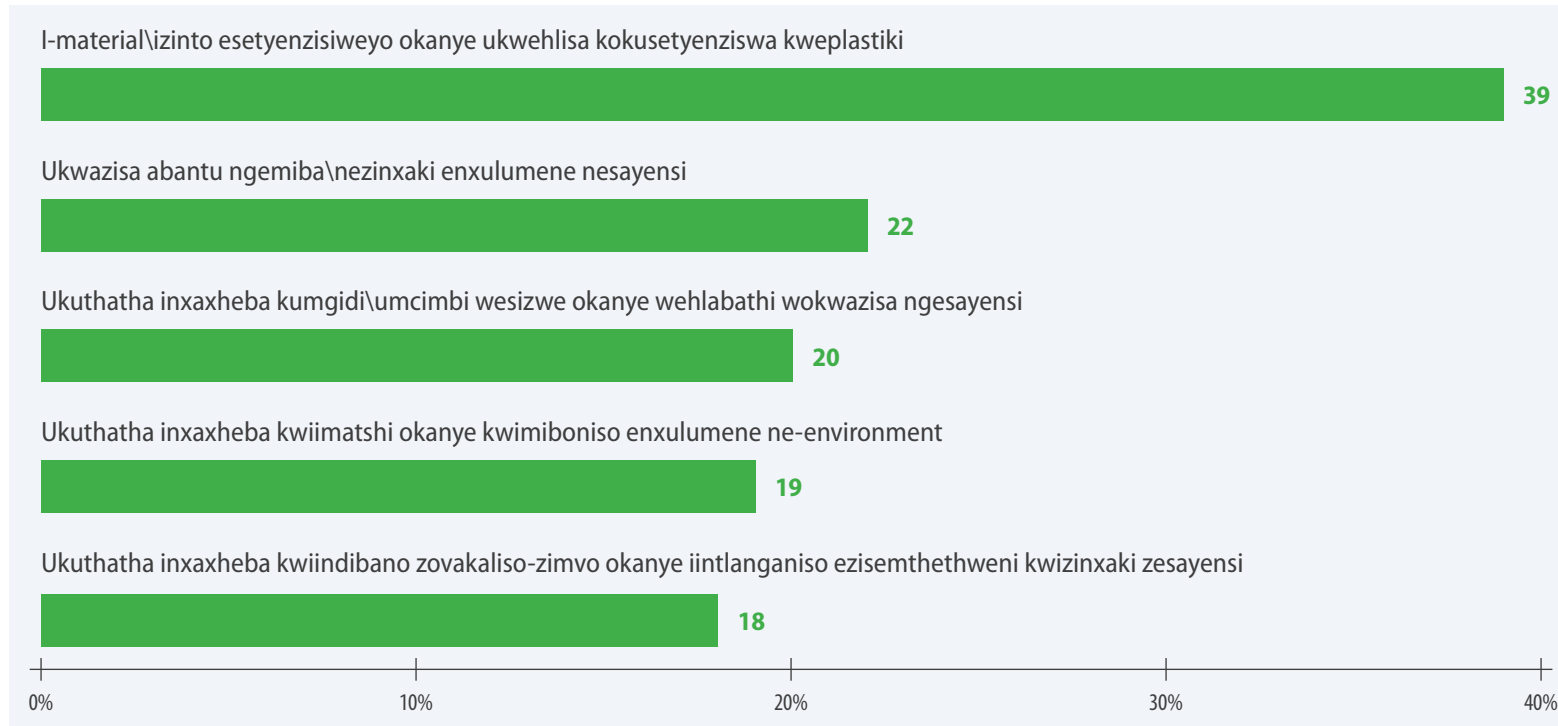


Abo nabouya kwimicimbi\imigidi ye-S&T kunye nezinto zokwenza:

- ndiphumelele kwimatriki nangaphezulu, kunye nenkxaso yasekhaya kwimfundo ephakamileyo;
- baphuma kumakhaya e-SES aphezulu,
- ehlala kwiindawo ezisesikweni zasezidolophini nakumatyotyombe,
- bebengabasebenzi, abafundi bezinga eliphezulu, nabafundi,
- bahlala kufutshane nezindawo ze-S&T, kwaye babesesichengeni kwaye basebenzise ulwazi oluninzi lwe-S&T.

10.3 Ukuzibandakanya malunga noluntu\ekuhlaleni

Intatho-nxaxheba kwimisebenzi yokuzibandakanya kwisayensi esekwe kuluntu\ekuhlaleni (% ubuncinci ngamanye amaxesha)



Umntu om-1 kubo bonke abantu abadala abasi-7

uxele ukuba imisebenzi yesayensi yoluntu efana nokucoca uluntu kunye nohambo lwendalo luyafumaneka kwindawo yabo



I-1 kwi-10

yabantu abadala ithatha inxaxheba rhoqo kwizinto zokwenza ezisekelwe



OZONA ZINTO ZOKWENZA EZIQHELEKILEYO

I-material yoku-recycle.a okanye ukunciphisa ukusetyenziswa kweplastiki



Ngubani obenentatho-nxaxheba ephezulu kwiindibano zoluntu\ekuhlaleni?

- Umahluko kwamanqaku aphakathi [average], ngokwamaqela angaphantsi, ibingumahluko obanzi lwesi-8 ukuya kuma-33
- Abo banokuba nenxaxheba ephezulu kwiindibano zesayensi ezisekelwe ekuhlaleni:
 - abantu abadala abaphumelele imatriki nangaphezulu,
 - abaqeshiweyo, abafundi bezinga eliphezulu, nabafundi, kunye
 - abo bahlala kwimimandla yasezidolophini esesikweni kunye neyasezidolophini.

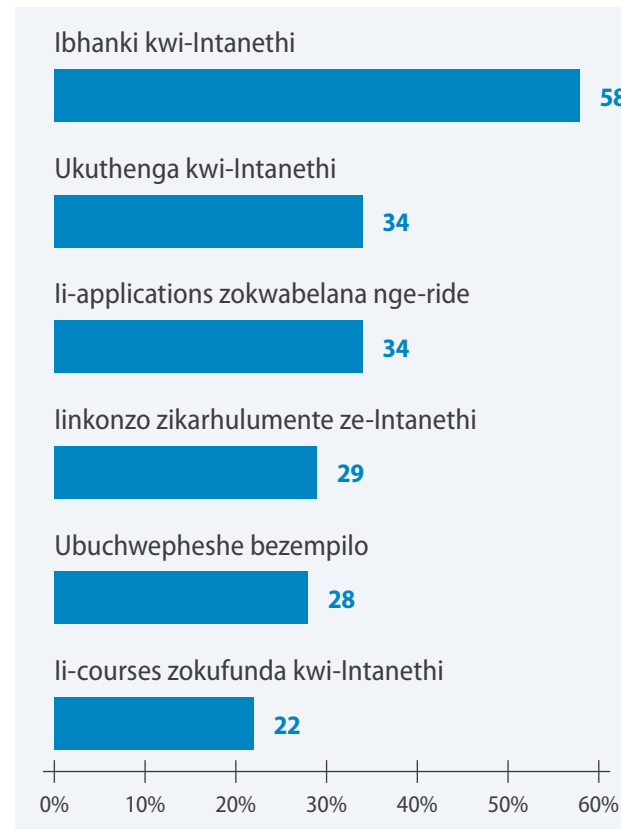
10.4 Ukuzibandakanya ekwabelaneni ngolwazi kunye nokuzibandakanya kwi-apps ze-internet

Ukongeza ekufumaneni ulwazi lwe-S&T, uluntu lwabelana ngolwazi, kunye neeapps ezisetyenziweyo kwi-intanethi. Bekukho amanqanaba asezantsi okwabelana ngolwazi, kunye nokusetyenziswa kwe-intanethi phakathi koluntu. Uluntu lwabelana ngolwazi lwe-S&T rhoqo nosapho, abahlobo, okanye abantu abasebenza nabo; kwaye eyona app isetyenziswa rhoqo kwi-intanethi, ii-intanethi banking.

Ukwabelana ngolwazi: njani kunye nobani (% noko ngamanye amaxesha)



Usetyenziso lwee-apps ezikhethiweyo ze-intanethi (% noko ngamanye amaxesha)



2 kubantu abadala abali-10

babelane ngolwazi kwaye basebenzise usetyenziso lwe-intanethi rhoqo



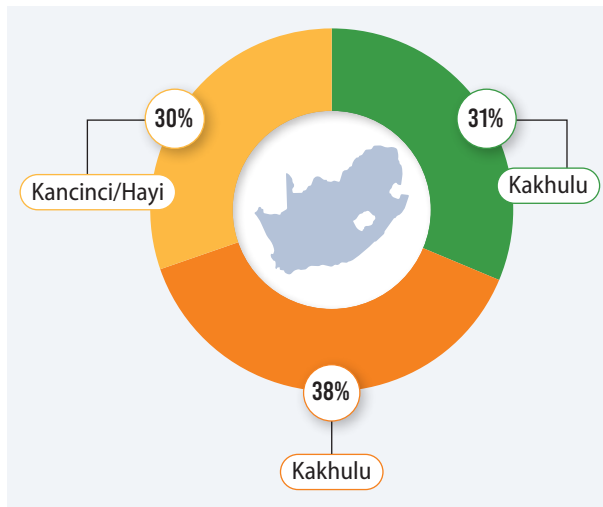
- Bekukho umahluko obanzi wamanqaku, ngokwamaqela angaphantsi, kukwabelana ngolwazi ukusuka kwi-18 ukuya kwi-46, kunye nokusetyenziswa kwee-apps ze-intanethi ukusuka kwi-11 ukuya kwi-56, zombini kwi-100.
- Abo babelane ngolwazi oluthe kratya kwaye baxela ukusetyenziswa okuphezulu kosetyenziso lwe-intanethi kunokwenzeka ukuba:
 - ukufumana imfundo ephakamileyo kunye nenkxaso yasekhaya kwiimfundo ephezulu,
 - Abane-SES ephezulu,
 - abe mncinci, aqeshwe, abe ngabafundi wezinga eliphezulu, nabafundi, kunye
 - bahlala kwiindawo ezisemthethweni nezingekho sikweni ezidolophini.
- Abantu abadala abantsundu base-Afrika bebenokwabelana ngolwazi, ngelixa abantu abadala base-India/eAsia nabamhlophe bebethanda ukunika ingxelo yokusetyenziswa okuphezulu kosetyenziso lwe-intanethi olukhethiweyo.

11 limbono zokuzingca, izithembiso, nezinto ezibekelwa phambili ngokubaluleka ngenkqubo yesizwe yokusungula izinto ezintsha







11.1 Ukuzingca kubantu baseMzantsi Afrika kwimpumelelo ye-S&T

Uluntu olunolwazi ngesayensi luxhaswa ziinqobo ezisemgangathweni ezamkelayo nezixhasa inkqubo yesizwe yokusungula izinto ezintsha. Ngelixa abantu abadala abasixhenxe kwabalishumi 'kakhulu' okanye 'bezingca kakhulu' ngempumelelo ye-S&T yaseMzantsi Afrika, babenenyani malunga nezo mpumelelo xa kujongwa neminye imimandla yehlabathi, kunye nekota enye kuphela evumileyo ukuba uMzantsi Afrika ungcono kuneEurope nas-North America.

Uzingca kangakanani ngempumelelo ye-S&T yeMzantsi Afrika (%)?



Ingaba impumelelo ye-S&T yaseMzantsi Afrika xa ithelekiswa neminye imimandla yehlabathi?

UMzantsi Afrika ungcono kune ...	Ipesenti yokuvuma
 Kwezinye iindawo zaseAfrika	 67%
 Ii-Europe and North America	 25%
 Amazwe aseAsia	 18%

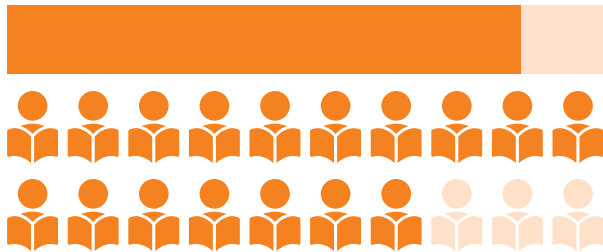
- Amanqaku aphakathi, ngokweqela elincinane, ahluka phakathi koluhlu oluphantsi nakancinci phakathi kwama-24 nama-40 kwi-100 ngokuzingca okuphezulu, naphakathi kwama-30 nama-41 kwali-100 kwabo babone impumelelo ye-S&T yaseMzantsi Afrika ingcono kunezinye izindawo. Oku kuthetha ukuba abantu baseMzantsi Afrika bathande ukwamkela isimo sengqondo sokuzingca ngokubanzi kwiimpumelelo ze-S&T, nangoko iimvelaphi zabo zihlukeneyo.
- Abo baxela ukuzingca okuphezulu kwiimpumelelo ze-S&T yayingabantu abadala abantsundu abantsundu, abo baphumelele imfundo ephakamileyo, abo bafumene inkxaso ethe vetshe ekhaya ngemfundo, kunye nabafundi bezinga eliphezulu kunye nabafundi.
- Abo bajonga impumelelo ye-S&T yaseMzantsi Afrika njengengcono kuneyakwamanye amazwe yayingabantu abadala abantsundu base-Afrika, abo banemfundo ephantsi kunye namanqanaba aphezulu enkxaso yemfundo yasekhaya, kunye nabo bahlala edolophini.
- Nangoko, abo bajonga impumelelo ye-S&T yaseMzantsi Afrika njengengekho bhetele kuneempumelelo kwamanye amazwe yayingabantu abadala base-Indian/Asia nabaMhlophe, abo banemfundo yamabanga aphakamileyo, kunye nabo bahlala kwezona zindlu zityebileyo ze-SES quintile.

11.2 Isithembiso sezakhono ze-S&T kubantu abatsha

Uluntu lulinganise isithembiso sezakhono ze-S&T kubantu abancinci kakhulu. Oku kuthumela umyalezo okhuthazayo kubantu abatsha malunga nokubaluleka kunye nexabiso lezakhono ze-S&T.

Abantu abatsha kufuneka bakhuthazwe ukuba bafunde nge-S&T

86



I-S&T ilungiselela abantu abatsha ukuba baphendule kwimingeni\kwizinxaki zasekuhlaleni\kuluntu

76

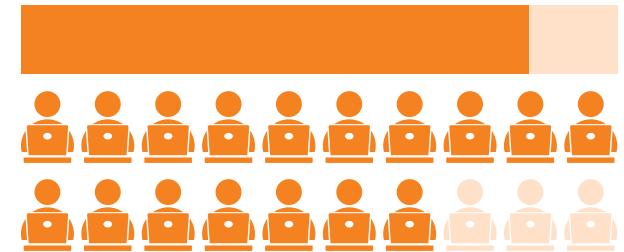


Iimpawu zabo balinganisela isithembiso sezakhono ze-S&T kakhulu

- Abantu baseMzantsi Afrika bathande ukwamkela imbono evumayo ngokubanzi ngesithembiso sezakhono ze-S&T kubantu abatsha, nangoko kuba beneemvelaphi ezahlukeneyo.
- Abo abaqaphele isithembiso esiphezulu se-S&T babe:
 - ngaphezu kwemfundo yamabanga aphantsi,
 - kunye nenkxaso yasekhaya kwimfundo ephakamileyo.

Izakhono ze-digital kunye ne-computer zibaluleke kakhulu kubantu abatsha

85



Isiqinisekiso se-S&T sinika ulutsha ukhetho oluninzi lwemisebenzi kunezinye ii-qualifications

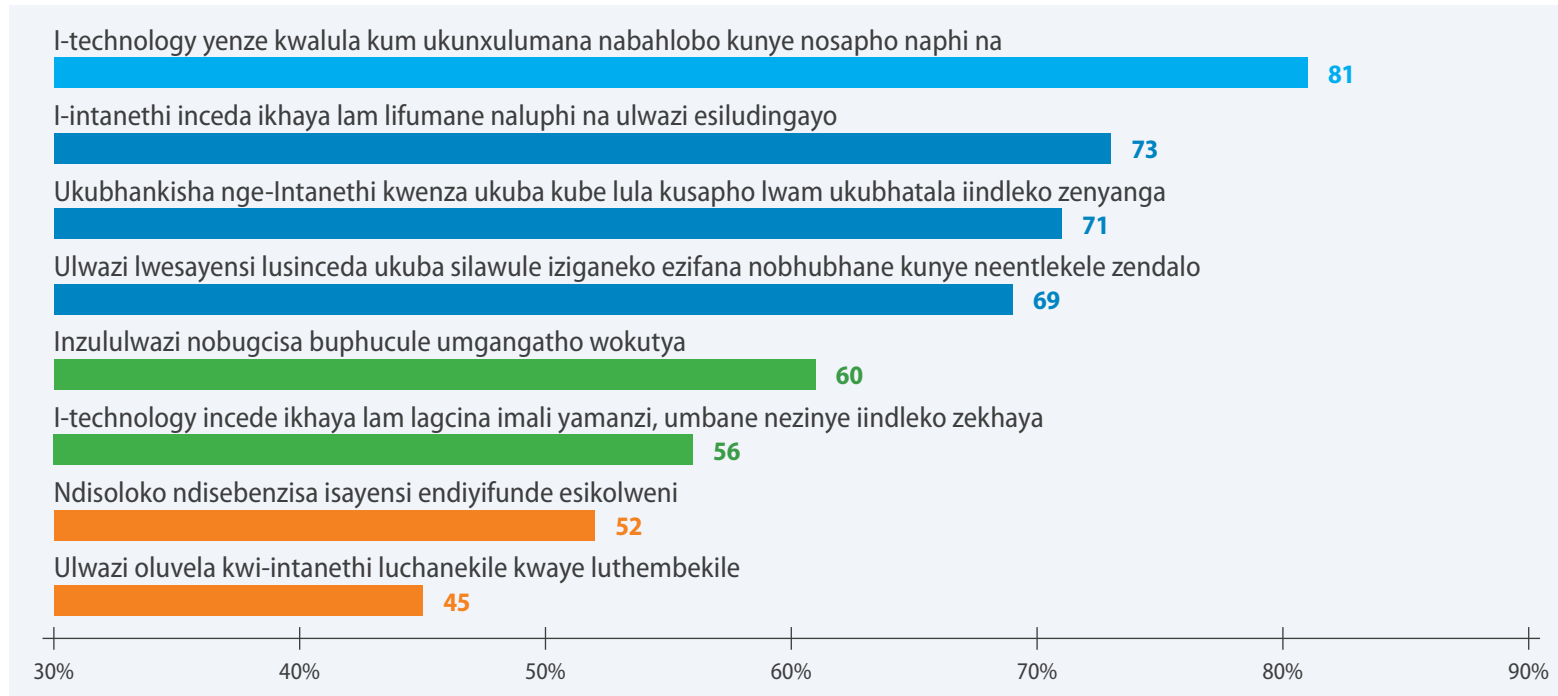
76



11.3 Amaxabiso we-experiences ze-S&T kubomi bemihla nemihla

Sinokuyixabisa ngakumbi into xa siyibona ibalulekile kubomi bethu.

Ixabiso lamava e-S&T kubomi bemihla ngemihla (% isivumelwano)



**IGQANABA ELIPHEZULU
LESIVUMELWANO**
Unxibelelwano olulula
phakathi kosapho kunye
nabahlobo luvulwa
bubuchwephesha\i-technology

81%



**INQANABA EZIPHANTSI
LEMVUMELWANO**
Ukuchaneka kunye
nokuthembeka kwe-intanethi

45%



**I-6 kubo bonke abantu
abadala be-10**

baxabisa i-S&T yokuphucula
umgangatho wokutya



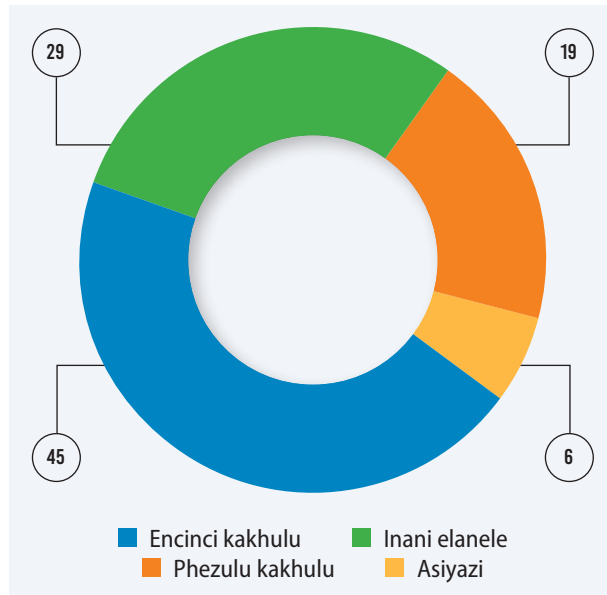
Ngubani oxabise amava e-S&T kakhulu?

- Abasibhozo kwaba-10 abantu abadala bayixabisile i-S&T ngokukwazi ukunxulumana nosapho kunye nabahlobo, ngelixa abasixhenxe kwabali-10 bexatyiswe i-S&T kulwazi olubonelelweyo kunye nokusetyenziswa ngokuthe ngqo kubomi babo bemihla ngemihla.
- Ngaphantsi kwesiqingatha soluntu sivumile ukuba ulwazi oluvela kwi-intanethi luchanekile kwaye luthembekile.
- Abo babewaxabisile amava e-S&T kakhulu:
 - babenemfundo yamabanga aphantsi nenkxaso yasekhaya kwimfundo ephakamileyp,
 - babebancinci, abafundi bezinga eliphezulu, abafundi, kunye
 - ababonise ulwazi oluphezulu kunye nomdla kwi-S&T.

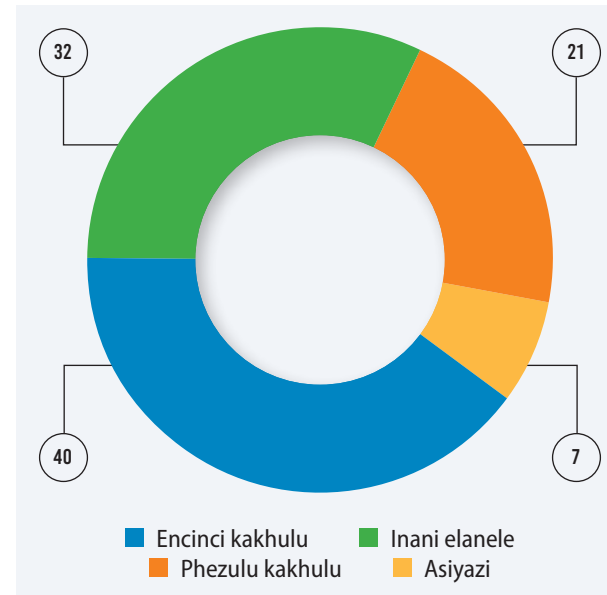
11.4 Inkxaso yoluntu ekusebenziseni imali kwisayensi nobuchwepheshe

Limbono zoluntu malunga notyalo-mali kuphando nophuhliso (R&D) zibonisa urhulumente ukuba uhlahlo lwemali lunokwabiwa njani. Uluntu lwalunoluvo lokuba ukusetyenziswa kwemali ngurhulumente yangoku kunye namashishini amakhulu kwi-R&D kwi-S&T kufuneka igcinwe okanye yandiswe.

Ukusetyenziswa kwemali ngurhulumente kwi-R&D (%)



Ukusetyenziswa kwemali ngamashishini kwi-R&D (%)



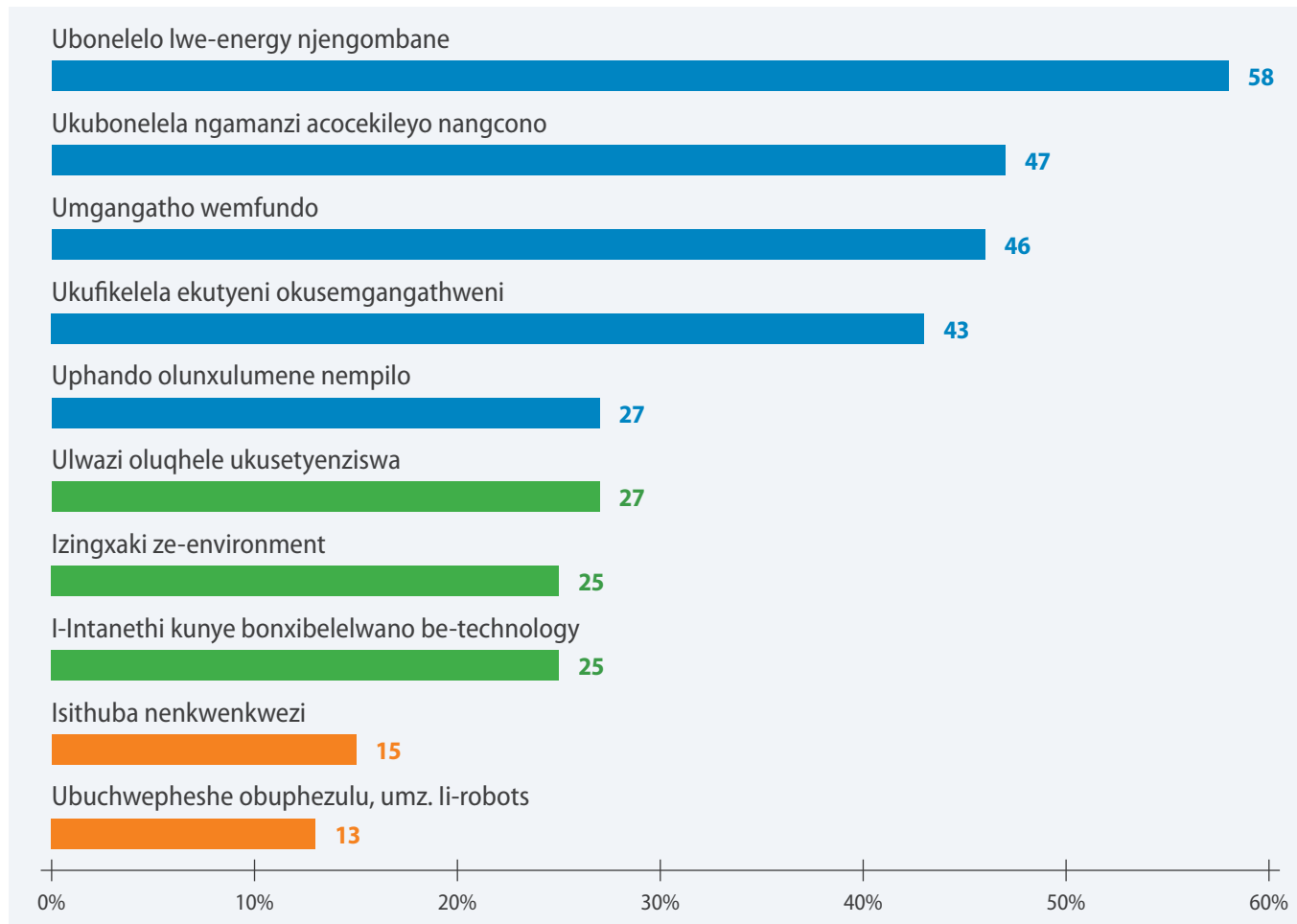
Iimpawu zabo baxhalabileyo ukuba ukusetyenziswa kwemali kwi-R&D ibiphantsi kakhulu

- Inkxaso ngokusetyenziswa kwemali karhulumente ye-R&D kwi-S&T ibe nokwahluka kwamanqaku amaninzi, liqela elingaphantsi, ukusuka kuma-31 ukuya kuma-68 kwali-100. Oku kuphakamisa imbono ezahlukeneyo phakathi koluntu.
- Abo babenenkxalabo yokuba amanqanaba akhoyo enkxaso-mali ye-R&D ebephantsi kakhulu:
 - abo banemfundo enomsila ephezulu,
 - abo bangabee-SES quintiles ezityebileyo, kunye
 - Abantu abadala abamhlophe, Coloured, Indian/Asian.

11.5 Ukubekela phambili\ukubaluleka ezophando lwe-S&T zoMzantsi Afrika

Kuluhlu lwendawo eziphambili ze-S&T, uluntu lukhethe iinkalo zophando ezine abacinga ukuba urhulumente kufuneka aqhubeka nokuxhasa ngemali. Ezona zinto ziphambili ngokubaluleka ezinxulumene nobonelelo lwe-energy, ubonelelo ngamanzi, kunye nomgangatho wemfundo; nangoko ezona zinto ziphambili ziphantsi yayiyindawo kunye nenkwenkwezi, kunye nobuchwepheshe obuphambili, obufana neerobhothi.

Izinto ezibalulekileyo ngophando lwase Mzantsi Afrika kwinkxaso-mali yexesha elizayo(%)



OKUPHAMBILI OKUPHAKAMILEYO\ OKUBALULEKILEYO Ubonelelo lwe-energy

58%



EZINGUNDOQO

Itekhnoloji ephezulu, efana neerobhothi

13%



- Ii-priorities zophando ezintlanu eziphambili kwinkxaso-mali yexesha elizayo (blue bars), ekhethwe luluntu ibonwa 'ingxamisekileyo kwaye ibalulekile'. Imele imingeni yoluntu yangoku, iziphumo zayo eziyinxalenye yamava emihla ngemihla oluntu.
- I-set yesibini yezinto eziphambili (i-green bars) zinokuhlelwa 'njengezibalulekileyo, kodwa azingxamisekanga'. I-set yesithathu yezinto eziphambili ngokubaluleka kunokwenzeka ukuba iwele kwi-category zophando lwe-"blue-sky", apho izicelo zelizwe lokwenyani zingabonakali ngokukhawuleza kuluntu.

12

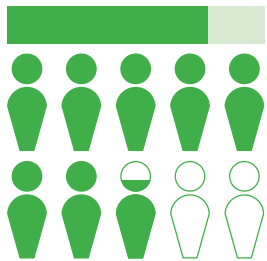
li-fingerprint nasayensi yobudlelwano boluntu baseMzantsi Afrika

Kwi-indicators esichongiweyo ngasinye kwezingama-27, sibale (i) ephakathi wamanqaku kwi-index (kwi-100), kunye (ii) nokwahluka kwamanqaku, ngokubala umahluko phakathi kwawona manqaku aphezulu nawona aphantsi kuwo onke amacandelwana ahlukeneyo.

AMANQAKU APHAKAMILEYO APHAKATHI [AVERAGE]:

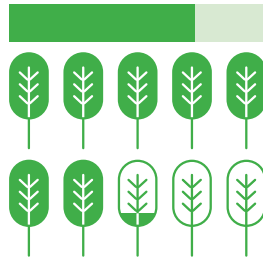
Isithembiso sezakhono ze-S&T kubantu abatsha

78



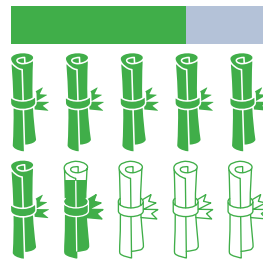
Inkxalabo ye-environment

72



Ukuthembela kulwazi lwe-S&T oluvela kwiiyunivesithi

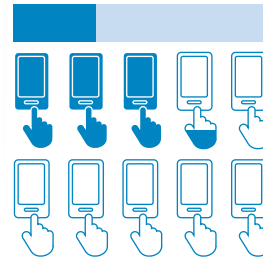
68



AMANQAKU APHANTSI NGAPHAKATHI EBENGU:

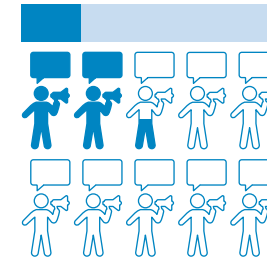
Ukusetyenziswa kwee-apps ze-intanethi

32



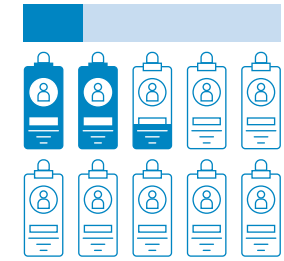
Ukuzibandakanya malunga noluntu

23



Ukufika kwabantu kwiimigidi yokutsala

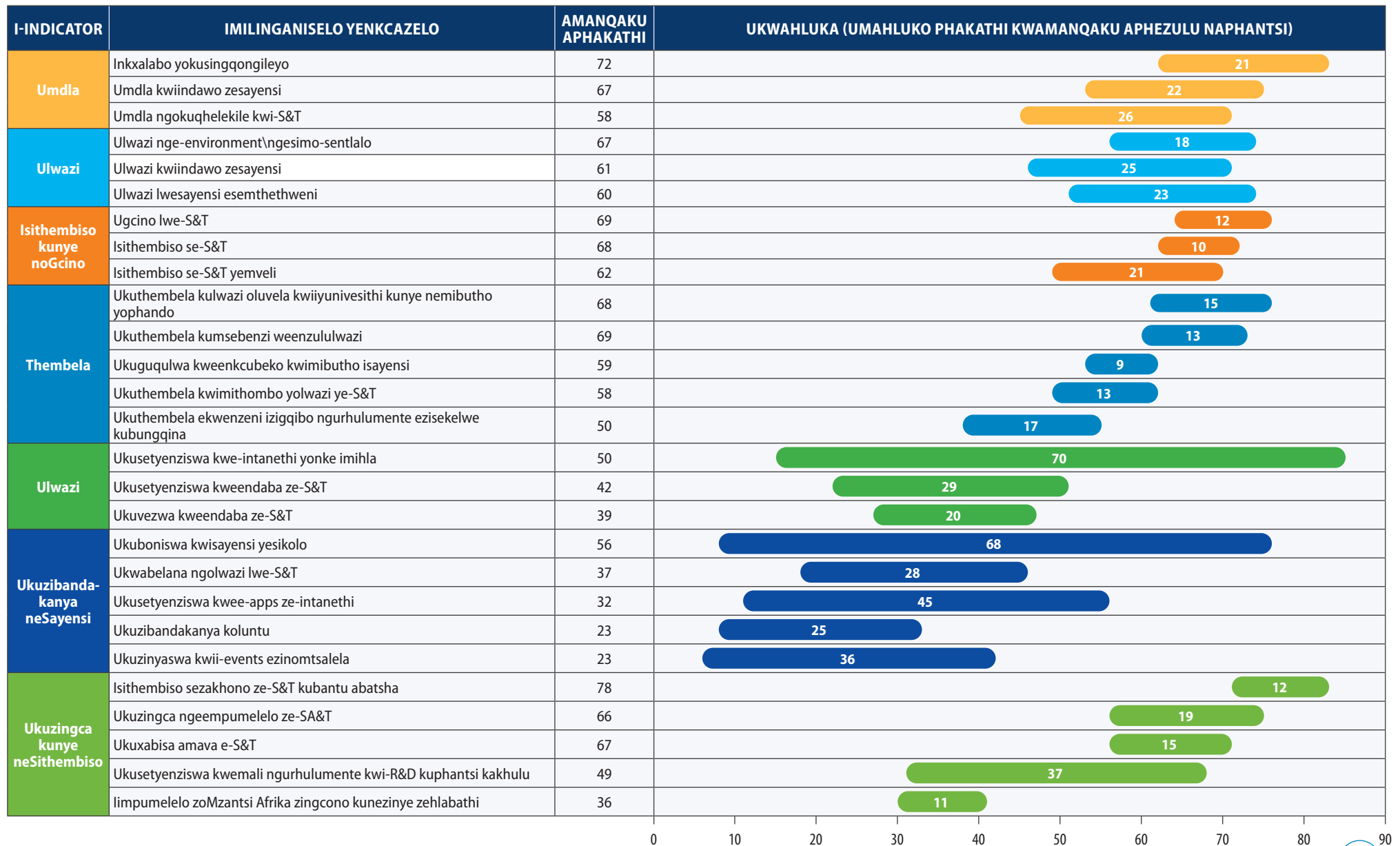
23



Nangoko, ukuhanjiswa kwamanqaku kwakuphezulu kusetyenziso lwemihla ngemihla lwe-intanethi (70) kunye nokuvezwa kwezifundo ze-STEM zesikolo (68); kwaye yayisezantsi kwintembeko, isithembiso, kunye nezimo zengqondo zogcino. Ukwahluka kwamanqaku okuncinci, esiwubize nge-egalitarian measures, kuthetha ukuba iimbono zoluntu ziyafana\ziphantse zifane, nangoko intalo-ntle yabantu yohlukile. Ukwahluka kwamanqaku okubanzi, okubizwa ngokuba ngama-measures ahlukeneyo, kubonisa ukungalingani ngenxa yeyantlukwano yentlalo-ntle yabantu abadala.

Emva koko siye sayila “uphawu lweminwe” oluhlukileyo lobudlelwane boluntu lwaseMzantsi Afrika nesayensi ngokuza neqhinga\licebo lamanqaku aphakathi [average], kunye nokwahluka kwamanqaku kwi-measure ngalinye, nto leyo ibamba ngendlela elula ikwahlukana kulwazi lwethu lwesayensi, isimo sengqondo, kunye amanyathelo okuzibandakanya.

12.1 Ulwazi lwesayensi, izimo zengqondo kunye nezalathi zokubandakanyeka, imilinganiselo, amanqaku aphakathi, ukwahluka kwamanqaku



12.2 Ukuhlela imilinganiselo kwintlobo ezine

Ukuqonda ngcono ukuhlukana kubudlelwane boluntu nesayensi, sisebenzise amanqaku aphakathi kunye nokwahluka kwamanqaku kwinqanaba ngalinye. Senze amanqaku aphakathi kunye aphezulu (sisebenzisa amanqaku aphakathi angama-50 njengendawo yokusika), kunye nobubanzi (okanye ohlukeneyo), kunye nokwahluka kwamanqaku amxinwa (okanye okulinganayo) (ukusebenzisa ukwahluka kwamanqaku angama-20 apho ahlukana khona.). Senze iindidi ezine.

AMAVA NGE-EGALITARIAN ANAMANQAKU APHEZULU NGOKUPHAKATHI

- Ukuxabisa amava emihla ngemihla e-S&T
- Ukuzingca ngeempumelelo ze-SA&T
- Isithembiso sezakhono ze-S&T kubantu abatsha
- Izimo zengqondo malunga nezithembiso ze-S&T
- Ukugcinwa kwezimo zengqondo malunga ne-S&T
- Thembela kumsebenzi we-scientists
- Ukuthembela kulwazi oluvela kwiiyunivesithi kunye nemibutho yophando
- Ukuthembela kwimithombo yolwazi ye-S&T
- Ukuguqulwa kweenkcubeko kwimibutho isayensi

AMAVA AHLUKENEYO NGAMANQAKU APHEZULU NGOKUPHAKATHI

- Ulwazi kwiindawo zesayensi
- Ulwazi lwesayensi esemthethweni
- Bukutyhileka kwizifundo zeSTEM zesikolo
- Ulwazi nge-environment\ngesimo-sentlalo
- Inkxalabo ye-environment
- Umdla ngokuqhelekile kwi-S&T
- Umdla kwiindawo ezithile ze-S&T
- Isithembiso se-S&T yemveli

IMILINGANISO EYAHLUKENEYO NGAMANQAKU APHANTSI NGOKUPHAKATHI

- Ukusetyenziswa kwe-intanethi yonke imihla
- Ukusetyenziswa kwee-apps ze-intanethi
- Ukuvezwa kweendaba ze-S&T
- Ukusetyenziswa kweendaba ze-S&T
- ukuzibandakanya malunga nokutsala
- Ukwabelana ngolwazi lwe-S&T
- Ukusetyenziswa kwemali ngurhulumente kwi-R&D kuphantsi kakhulu

IMILINGANISO E-EGALITARIAN ENAMANQAKU APHANTSI NGOKUPHAKATHI

- Iimpumelelo zoMzantsi Afrika zingcono kunezinye zehlabathi
- Ukuthembela ekwenzeni izigqibo ngurhulumente ezisekelwe kubungqina



13

Iziphumo ziya kwandisa ubudlelwano babantu kunye nesayensi eMzantsi Afrika



1

UBANDAKANYO KWISAYENSI KUNYANZELEKILE LWAMKELE ISAYENSI KUNYE NE-SOCIETY PARADIGM

Uphononongo lwangoku, kunye nendlela ye-DSI kwinkqubo yokuzibandakanya kwisayensi, ibekwe ngaphakathi kwi-paradigm yesayensi-kuluntu eqaphela indlela emibini kunye nendlela bencoko yobudlelwane phakathi kwesayensi noluntu, kunye neendima zabantu kunye namaziko.



2

KUFUNEKA SITSHINTSHE IBALI NGENDLELA ESILINGANISA KUNYE NESICHAZA NGAYO ULUNTU LWASE MZANTSI AFRIKA

Iimbono zabantu boMzantsi Afrika zicingela, ziqwalaselwe, zilungelelene, kwaye zibonisa ulwazi ngophuhliso lwe-S&T. Malunga nesiqingatha samanyathelo avavanyweyo, uluntu lubonise iimbono ezifanayo kungakhathaliseki imvelaphi yentlalo-ntle yabantu. Kweminye imilinganiselo bekukho ukwahluka phakathi kweempendulo zabantu.



3

AWUKWAZI UKUHAMBA KAKUBI NGOKUPHUCULA ULWAZI LWESAYENSI

Iinkqubo zokwazisa ngesayensi yoluntu kufuneka zihanjiswe ngamaqonga eendaba aqhele ukusetyenziswa kunye nezentlalo, kufakwe isayensi eyinxalenye yamava obomi babantu ngaphakathi kwintetho kawonke-wonke.

**4****UKWANDISA UMDLA KWI-S&T KUNYE NOKWAKHA ULUNTU OLUKHUTHAZA I-CULTURE YESAYENSI**

Umlinganiselo kunye nokufikelela kwiinkqubo zesayensi zangoku zokubandakanya kufuneka kwandiswe, kunye neenkqubo ezintsha ezinomxholo ofanelekileyo nobandakanyayo kufuneka ziqaliswe kwaye zidluliselwe ngeendlela ezahlukeneyo. Ezi nkqubo kufuneka zijongiswe ekubetheleleni inkcubeko yomdla wesayensi kunye nemibuzo eluntwini.

**5****UKWAZI, UMDLA KUNYE NEXHALA YE-S&T ZINXUMELENE KAKHULU**

Ukugxila kumdla kunokuba luncedo ngakumbi kungenelelo. Oku kunesakhono sokudala ukujika wenyani kwaye ube neenzuzo ezithe vetshe kunye ne-spillovers ukuya kwamanye amanyathelo aphononongwe kolu phononongo, olufana nolwazi kunye nenkxalabo.

**6****UNXIBELELWAN LWEMFUNDO EKHAYA KUNYE NOKUZIBANDAKANYA KUBALULEKILE**

Kulo lonke uhlalutyo, eyona nto ibalaseleyo yayiyinxaso yasekhaya kwimfundo ngeendlela ekhuthazayo yokufunda, umsebenzi wesikolo owenzelwa ekhaya, neengxoxo ngeendaba, kwakunye nokuqhuba kakuhle nokuthatha izifundo zesayensi esikolweni. Inxaso yasekhaya kwimfundo ibonisa ukubaluleka kokufuna ukwazi phakathi kwezizukulwana kunye nokwakhiwa kolwazi.

**7****IIMBONO NGESITHEMBISO KUNYE NOKUZINGCA KUNYE NOKUTHEMBELA KWI-S&T ZI-EGALITARIAN NGESIMO**

Ukudibanisa kunye nokwakha ngakumbi kwezi mbono kufuna ukuqinisekiswa kwenkqubo yenkcubeko exabisa, ebhiyozela, kwaye ikhuthaza i-S&T. Kufuneka senze imeko yenkcubeko ebonisa iinkqubo zokwenza izigqibo ezisekelwe kubungqina, iingxoxo-mpikiswano, ukugxeka, kunye nokuphikisana kwengcinga.

**8****AMANQANABA OLWAZI LWESAYENSI KUNYE NOKUFIKELELA, I-EXPOSURE KUNYE NOKUSEBENZISA KWOLWAZI LWE-S&T LOHLUKILE NGESIMO**

Ezona mpawu ziphambili ezazisa le yantlukwano kukufikelela kwimfundo, iwonga lentlalo noqoqosho, nokuba ngumfundi wezinga eliphezulu okanye umfundi. Ukwandiswa konxibelelwano lwezesayensi kunye nokuzibandakanya ngokusebenzisa ama-channel amaninzi, ukusuka kushicilelo ukuya kusasazwa kwendaba ezentlalo, kufuneka kukhuthazwe kwaye kugunyaziswe.

**9****UKUFIKELELA OKUKHUPHUKILEYO KULWAZI LWE-S&T**

Ikota yesithathu yoluntu inokufikelela kwi-intanethi. Uluntu luyazithemba iindaba ze-S&T eziziswe ngumabonakude kunye nee-radio kodwa zilumkile malunga neendaba ze-S&T kwi-social media. Ulwazi lwe-S&T kufuneka ludluliselwe ngeendlela eziqondakala lula, ngakumbi kumabonakude nakwi-radio.

**10****UMAHLUKO OMKHULU EKUZIPHATHENI KOKUZIBANDAKANYA KWISAYENSI UYAQHUBEKA KODWA UNOKUPHENJELELWA KAKUHLE NGOKUPHAKAMISA ULWAZI LWESAYENSI KUNYE NOMDLA KUNYE NOKOYISA UBUNZIMA EKUFIKELELENI**

Ngokubanzi, amanqanaba asezantsi okuzibandakanya kwisayensi abonwa kuzo zonke iintlobo zokuzibandakanya. Ama-campaigns okunyusa ukusetyenziswa kolwazi, umdla kunye nolwazi, kudityaniswa neenzame zokukhuthaza ukufikelela okukhulu kwiindawo ze-S&T kunye neziganeko, kuya kulindeleka ukuba zibe nefuthe elihle kumanqanaba okuzibandakanya kwisayensi.

**11****FUNDISA ULUNTU NGEXABISO LWENDLELA EQHELEKILE YE-S&T**

Kukho imfuneko yomzamo ohlangeneyo wokunxibelelana, ukwazisa, ukufundisa, ukubhiyozela, kunye nokudala ulwazi malunga nale ndawo etyebileyo ye-S&T kuluntu olukhulu.

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