

Student ability to learn at home

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STUDENT ABILITY TO LEARN AT HOME: AN INTRODUCTORY LOOK AT STUDENT ACCESS TO REMOTE LEARNING RESOURCES

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The rise of the Covid-19 pandemic led South African president, Cyril Ramaphosa, to declare a national state of disaster on 15 March 2020. In response to the announcement, tertiary education institutions and student residences around the country closed in order to mitigate the spread of COVID-19. These institutions were required to come up with remote teaching and learning solutions in a relatively short period of time. While virtual classes on personal tablets may have become the global norm, many South African students lack access to internet and data connectivity, and may rely on shared or mobile devices off which to learn. In addition, glaring structural inequalities plague a multitude of socio-economic factors in South Africa. These factors shape the household environment in which many students have found themselves, and in which they have been expected to learn new academic material.

Household access to electricity, a stable internet connection and a suitable device dictate to a large degree the quality of students' remote learning – if it is taking place at all. Although institutions and residences have implemented a [phased return](#) of the most vulnerable students, those who have not yet been able to return face continued constraints to their learning.² The

impact of protracted online learning on those returning is unlikely to be negligible either. Therefore, existing household inequalities are likely to have disadvantaged, and continue to disadvantage, students in this time.

In this review, we provide high-level descriptive insights into the characteristics of home environments for students from public universities and Technical and Vocational Education and Training [TVET] colleges in South Africa. Using the 2016 Community Survey, we construct indicators for access to electricity, access to a stable internet connection and access to a device (tablet or computer) in the home. We define these three resources as the minimum requirements for remote learning to take place. Each indicator is aggregated to the municipality level to estimate the proportion of all households³ in each municipality with access to the respective indicators. A single indicator which measures if a household has access to all three of these resources is also created and aggregated to the municipality level. This indicator is referred to as the 'remote learning' indicator. We then map students' home postal code, collected in institutional⁴ databases, to the municipality-level indicators created using the 2016 Community Survey.

1 Siyaphambili post-school research group in SALDRU, order of listed authors names randomly assigned.

2 Some institutions have not yet had students return, but plan to reintegrate students by the end of August. Other institutions (e.g. Walter Sisulu University) have had a delayed response to the implementation of remote learning.

3 We do not restrict the analysis to households containing students as the sample size is too small. This means our aggregated municipality estimates will have greater variance. Instead, we assume that households containing students and households without students in a given municipality are similar in regard to our variables of interest.

4 Public university data is from 2018 and TVET college data is from 2019. Although this data is not from 2020, we do not have reason to believe the demographics of the student body have shifted significantly in the last two years.

It should be noted that these indicators are crude in two ways. Firstly, we can only elicit the average characteristics of households in students' municipalities, and not the characteristics of student households themselves. Secondly, the Community Survey data does not address access to devices or the internet in a very detailed way,

which hinders our ability to comprehensively unpack the factors affecting student remote learning. Nonetheless, the results are broadly illustrative of low levels of access to the necessary (although not sufficient) remote learning 'resources' in municipalities in which students reside.

Distribution of students

To contextualise the analysis, we first assess the distribution of university and TVET college students nationally. On the whole, the provincial distribution of students mirrors overall population density closely; provinces with low population density have low student numbers ([Statistics South Africa](#) [StatsSA]). Figure 1 shows the distribution of university and TVET students across municipalities⁵. The figure shows that university student origins are more concentrated than TVET student origins. For example, just over 25% of all students in the university sector come from just three municipalities; 11.55% from the City of Tshwane, 9.48% from eThekweni, and 6.25% from Ekurhuleni. The next 25% of students reside across 8 municipalities, and the remaining 50% of university students are spread over the remaining 206 municipalities.⁶

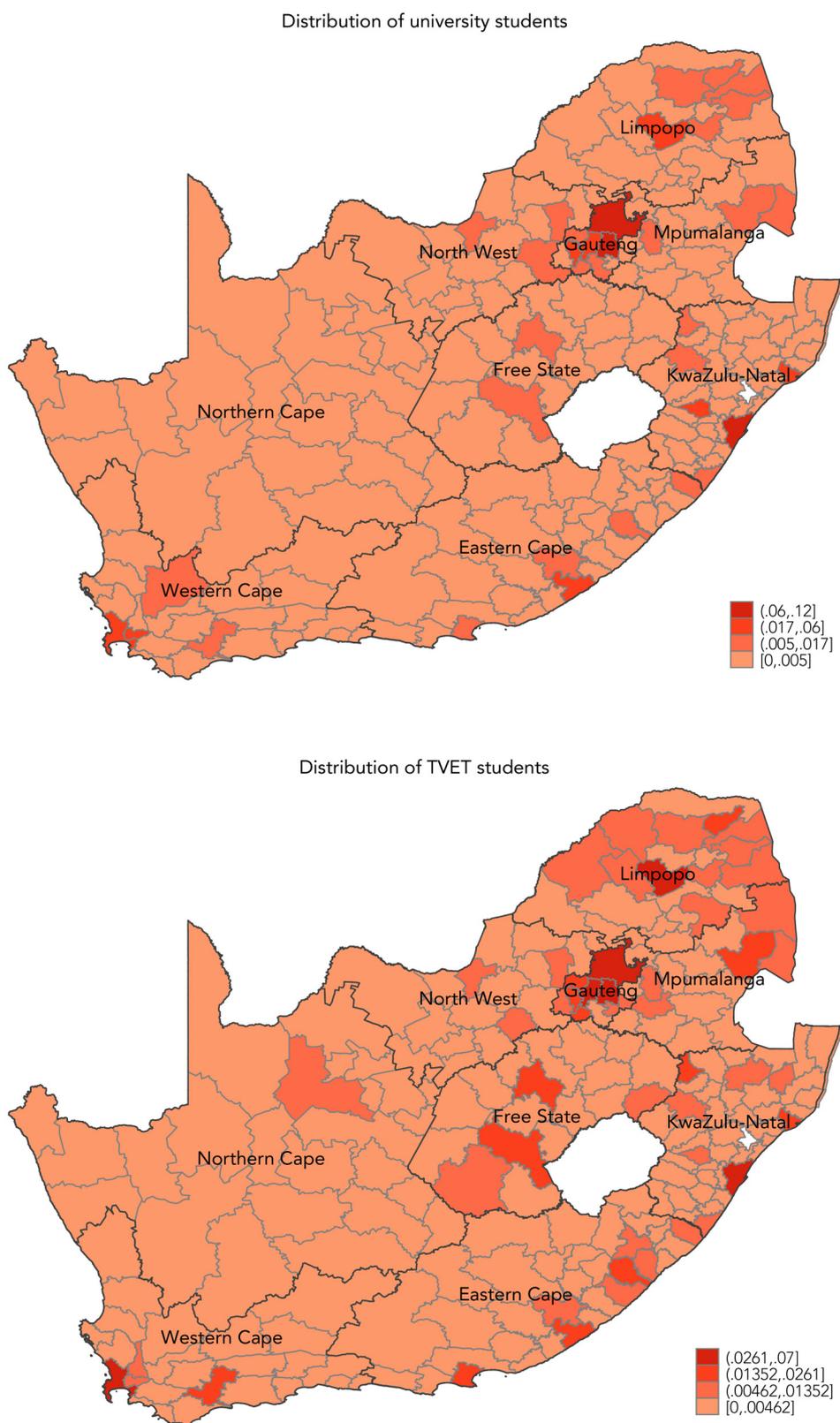
For TVET students the concentration is lower; 25% of all students in the TVET sector come from six municipalities. The municipality with the highest share of TVET students is the City of Cape Town (6.89% of TVET students), followed by those most densely populated with university students too, namely: Ekurhuleni (5.6%), eThekweni (5.35%) and the City of Tshwane (4.99%). The following 25% of TVET students come from 12 municipalities in total, with the remaining 50% distributed across 194 municipalities. The average characteristics of households in these more densely populated municipalities will contribute more significantly to the aggregate pictures of student connectivity that follow. Results should be understood with these distributions in mind.

5 The share of students is calculated as the number of students in a municipality over the total population of students.

6 Municipalities are ranked based on this share and grouped such that the sum of the shares approximately equals 25% in each coloured category.

One of the 213 municipalities in South Africa has no resident students from a university or TVET college. This is Maphumulo municipality in KwaZulu-Natal.

Figure 1: The distribution of university and TVET college students by municipality



Notes to Figure 1:

Source: Authors' own calculations using data from Higher Education Management Information System [HEMIS] 2018, Technical and Vocational Education and Training Management Information System [TVETMIS] 2019.

Sample: Number of students: N=1 043 646 (University); N=648 498 (TVET).



Indicator #1: Electricity access

Levels of electricity access in South Africa are good. Statistics South Africa [StatsSA] reports that [85.4% of households had access to electricity](#) in 2013. Using the 2016 Community Survey data, we estimate that 87.55% of households have access to prepaid or metered electricity.⁷ It is thus not unexpected that average level of access to electricity in municipalities in which students reside is high, 85.96%. For this reason,

we do not report a figure alongside this indicator. The majority (70%) of university students reside in municipalities where more than 85% of households have access to electricity, as do the majority of TVET students (69,76%). TVET students fare slightly worse on average, but only marginally so. As noted, however, we cannot infer actual access levels in student households.



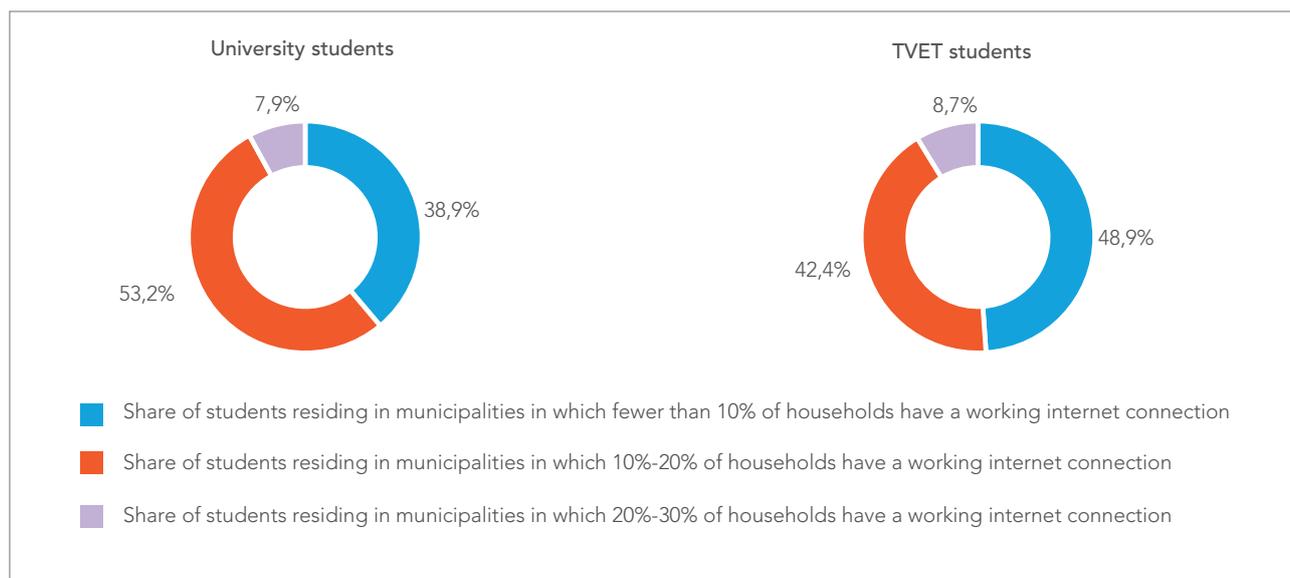
Indicator #2: Internet access

Next, we look at internet access. Fewer than 30% of households in all municipalities in South Africa have internet access. The municipality with the highest share of households with access to internet services is Richtersveld municipality in the Northern Cape, at 28.05%. Figure 2 shows the proportion of students living in municipalities where fewer than 10%, between 10% and 20%, and more than 20% (with an upper bound of 28.05 %) of households have access to an internet connection respectively.

The majority (53.15%) of university students come from municipalities in which 10-20% of households have access to the internet. On the other hand, the majority of TVET students (48.9%) reside in municipalities in which fewer than 10% of the households have access to an internet connection. TVET students, in addition to facing more severe institutional barriers to online learning (e.g. lack of e-learning platforms), appear more likely than university students to face barriers to online learning through lack of connectivity in their homes.

7 Data are weighted using household-level post-stratification weights.

Figure 2: Percentage of students by share of households in their home municipality with internet access



Notes to Figure 2:

Source: Authors' own calculations using data from Community Survey 2016 (StatsSA), HEMIS 2018, TVETMIS 2019. Community survey data are weighted using household-level post-stratification weights.

Sample: N=1 043 646 (University); N=648 498 (TVET).

Low levels of connectivity are supported by [results](#) of a recent survey of South African youth (ages 18 to 35) by the Southern Africa Labour and Development Research Unit [SALDRU] and UNICEF South Africa. The survey finds that 11% of respondents have access to the internet, and only 17% said they have access to a data bundle. In an attempt to remedy this dire connectivity

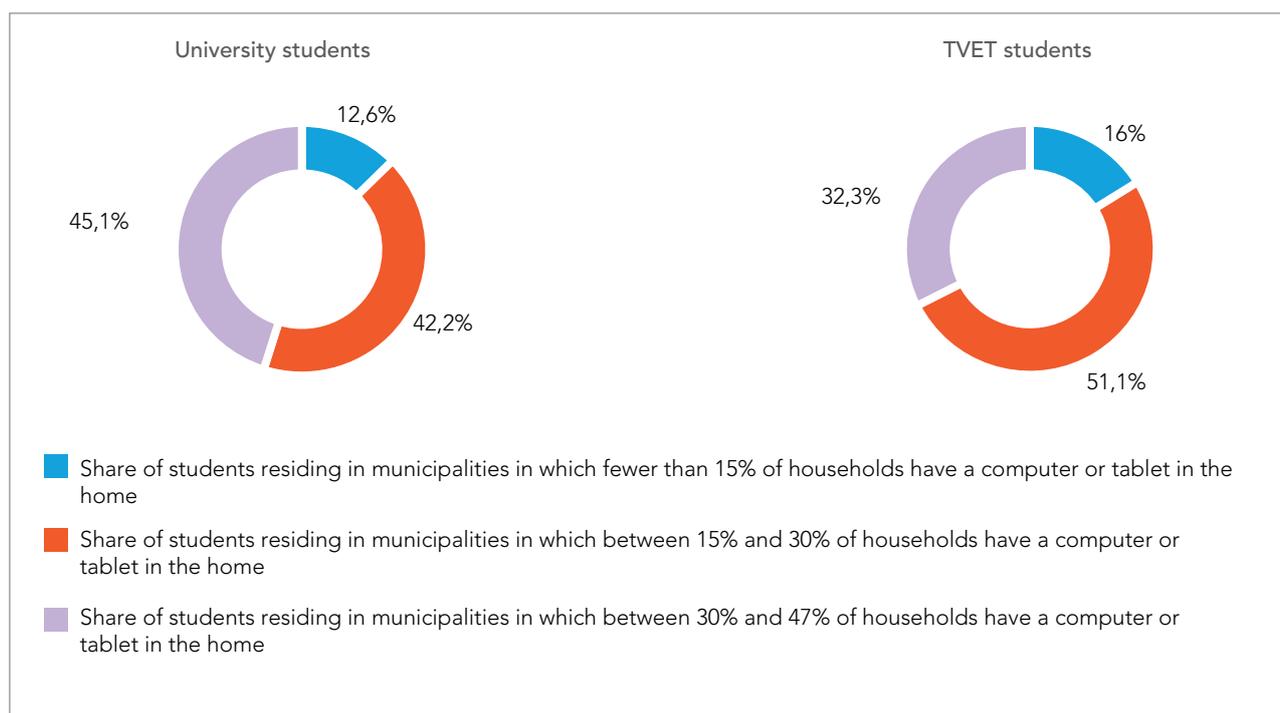
situation, some institutions are offering data bundles to students, and certain TVET colleges are broadcasting material on radio platforms. However, even in this regard, where students face network connectivity or signal issues, students will be no better off for having data (see this [article](#) on the digital learning divide for students' stories regarding connectivity issues).

Indicator #3: Device access

Figure 3 shows the proportion of students living in municipalities where the average number of households with access to a device (computer or tablet, which may or may not be shared) is less than 15%, between 15% and 30% and greater than 30% (with an upper bound of 46.46%) respectively. The highest share of households with access to a device is 46.46% in the Gamagara municipality in the Northern Cape, closely followed by Midvaal municipality in Gauteng where 46.29% of households have access to a device. Figure 3 shows that on

average, just under half of university students reside in municipalities where between 30% and 47% of households have access to a device. In comparison, only one third of TVET students reside in municipalities with similar device access levels. The fact that the remaining two thirds of TVET students reside in municipalities where fewer than a third of households have a device is staggering. Although some universities have provided vulnerable students with laptops, the [distribution of laptops by some institutions has been delayed](#).

Figure 3: Percentage of students by share of households in their home municipality with access to a computer or tablet in the home



Notes to Figure 3:

Source: Authors’ own calculations using data from Community Survey 2016 (StatsSA), HEMIS 2018, TVETMIS 2019. Community survey data are weighted using household-level post-stratification weights.

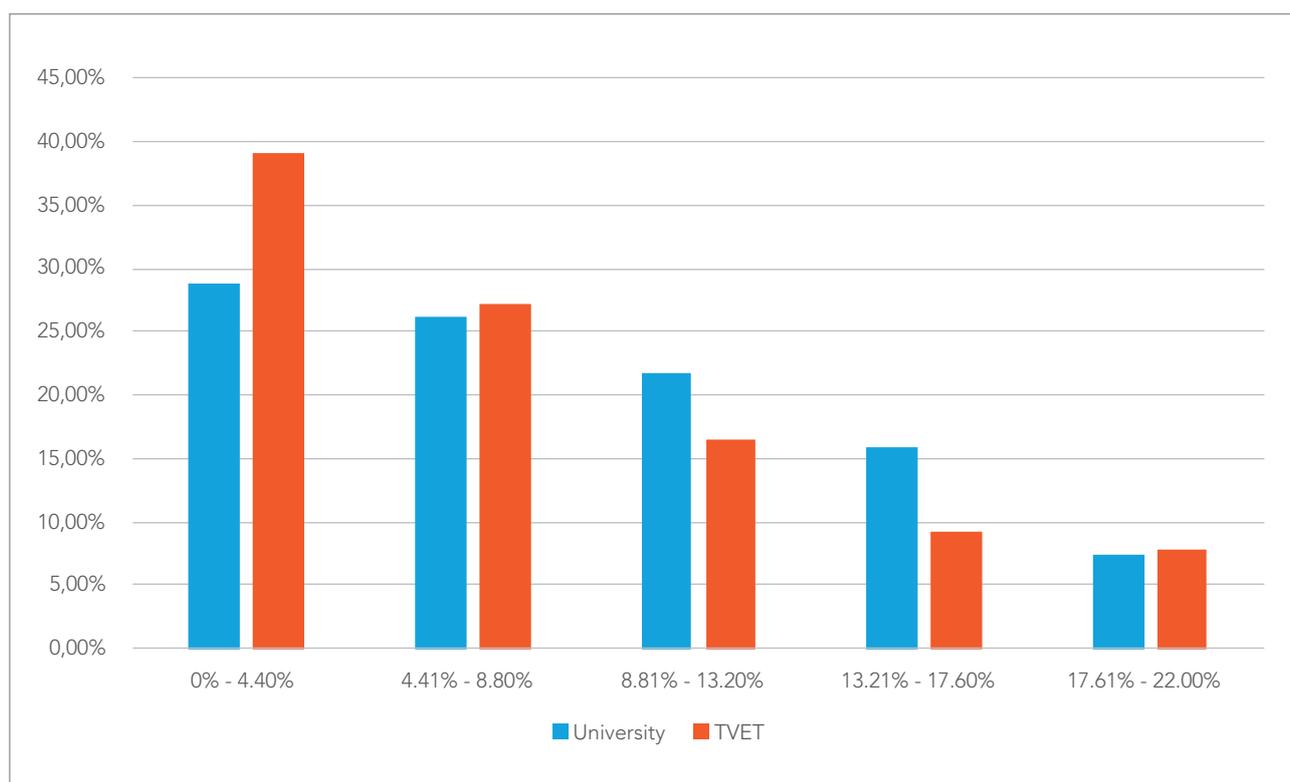
Sample: N=1 043 646 (University); N=648 498 (TVET).

Combined remote learning indicator

Lastly, Figure 4 combines our three summary measures into one ‘remote learning’ indicator. This remote learning indicator captures the share of households in a municipality that have access to all three resource types, namely: electricity access, internet access and access to a device (computer or tablet). Given that the share of households in a given municipality with access to a stable internet connection is particularly low, our ‘remote learning’ indicator is bounded above by our internet indicator. Generally, a household would need electricity and a device to successfully use the internet. It is also unlikely that households will have access to the internet

but not have access to electricity and a device. More than 50% of both university and TVET students reside in municipalities where fewer than 10% of households have access to all three resources. Thirty-nine percent of TVET students come from municipalities where fewer than 4.4% of households have access, compared to 29% of university students. This means a higher proportion of TVET students compared to university students are clustered at the lower end of the distribution, once again foregrounding the relative disadvantage of TVET students regarding ability to learn remotely.

Figure 4: Percentage of students by share of households in their home municipality with access to electricity, internet and a computer or laptop in their home (access to all remote learning resources)



Notes to Figure 4:

Source: Authors’ own calculations using data from Community Survey 2016 (StatsSA), HEMIS 2018, TVETMIS 2019. Community survey data are weighted using household-level post-stratification weights.

Sample: N=1 043 646 (University); N=648 498 (TVET).

At the time that South Africa’s nationwide lockdown was announced, the closing of educational institutions and the uptake of remote learning was intended to be a relatively short-term solution to continuing education under lockdown circumstances. However, the Department of Higher Education and Training plans to continue the implementation of remote learning across the system ([mixed with contact learning where possible](#)), with the academic year expected to [extend](#) into the early part of 2021. From this preliminary analysis, however, it is clear that students at both university and TVET colleges lack adequate resources for remote learning, especially for such a prolonged period of time.

Although solutions to remedy the situation have been implemented to varying degrees across the sector, these have been implemented in an uncoordinated manner, and students have remained [underserved](#). It seems, additionally, that judging solely on the average municipality-level characteristics of students’ homes, TVET students fare worse than university students. However, we acknowledge that varying degrees of institutional advantage exist across the university (and TVET college) sector too. This analysis does not capture the nuance in differential privilege - or lack thereof. We leave addressing this salient feature of the sector to future work.

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