

The Determinants of Throughput in Adult Educational Programmes

What are the determinants of throughput in adult education programmes and ODL in South Africa?

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The Purpose of this Paper

- The problem: Throughput rates are exceedingly low for all courses, and even lower for ODL programmes.
- Framing the problem: Painting a picture of South Africa's educational landscape
- **Understanding the problem: Establishing a set of preliminary determinants of throughput for adult educational programmes.**
- These determinants are based on descriptive statistics, economic theory, and anecdotal evidence.
- Provides pointers towards avenues requiring greater econometric analysis.
- Provides recommendations for future avenues of inquiry that may help to address the problem.

Throughput as a Measure of Efficiency

- Throughput may be defined as “the amount of material or items passing through a system or process”.
- Throughput is, in an educational setting, defined as “the rate at which a cohort successfully completes a qualification within the stipulated timeframe for that qualification” (DHET, 2021).
- Sondlo (2013) provides for this: throughput is a measure of efficiency because it indicates a kind of ‘yield’ – which indicates what proportion of enrolled students graduate within the prescribed time.
- However, the concept of throughput as a measure of efficiency needs to be brought into question. One needs to consider what ‘throughput’ is in fact a measure of.
- It speaks of an outdated industrial ‘input-output’ conception of the educational process, measuring the rate at which a system is able to ‘upload’ the contents of a course to the minds of learners – as if they were homogenous ‘tabula rasa’.

Throughput, Graduation and Dropout Rates

- Sommer and Dumont (2011) note that “Data show that 50% of students enrolled in higher education institutions drop out in their first three years, with about 30% dropping out in their first year (DoE, 2005). With a graduation rate of 15% South Africa ranks lowest in the world (DoE, 2005).”
- The dropout rate for adults aged 23-38 decreased from 19.5% in 2002 to 6.6% in 2018 (Statistics South Africa).
- DHET (2020) report the following broad findings: (1) success rates at university are 77% for 2019/20; and (2) success rates for HEI undergraduates in contact mode was 82%, whereas for distances learners this stood at 69% - significantly lower than the contact mode learners.
- There has been an improvement in throughput rates for undergraduate programmes within public HEIs in general, and yet the throughput rates remain untenably low.
- DHET (2018) reports that “the overall throughput remains low with 55.6% of the 2007 cohort graduating after 10 years and 56.5% of the 2010 cohort graduating after 7 years”.
- That is, almost half of the learners who enrol in undergraduate programmes do not graduate. This is both financially costly, and potentially indicative of underlying socioeconomic or institutional issues which are resulting in learners exiting the educational system without qualifications (DHET, 2018).
- The dropout and throughput figures noted for distance education offer an even more disheartening picture.

Throughput, Graduation and Dropout Rates

HEI undergraduate cohorts 2007	3 or 4 years of study (stipulated)		6 years of study		10 years of study	
	Contact	Distance	Contact	Distance	Contact	Distance
Overall	19.5%	-	60.4%	10.9%	67.9%	19.4%
3 year diploma	20.8%	-	52%	12.5%	62.3%	21%
3 year degree	28.1%	-	66.6%	15.1%	73.9%	26.6%
4 year degree	40.3%	-	66.7%	17.9%	75.8%	33.6%

Figure 19: Throughput for HEI undergraduate cohorts, contact and distance 2007 (DHET, 2018).

Throughput, Graduation and Dropout Rates

- TVET colleges report the following success rates:

TVET qualifications	Certification/throughput rate
TVET NC(V) Level 4 certification rate	53.9%
N3 certification rate	83.2%
N6 certification rate	87.1%
TVET NC(V) Level 4 throughput rate	31.8%
Funded NC(V) Level 4 throughput rate	31.8%

Figure 20: Throughput for TVET qualifications (DHET, 2020).

	N3		N6		NC(V) L4	
	TVET	Private	TVET	Private	TVET	Private
2013	44.6%	31.7%	35.6%	36%	37%	43%
2014	55.4%	38.1%	42.8%	40.1%	34.4%	40.5%
2015	64.9%	47.4%	61%	50.1%	40.2%	31.5%
2016	65.8%	47.6%	66.1%	57%	41.7%	31.4%
2017	76.8%	64.6%	96.1%	91.6%	42.9%	32.3%
2018	83.2%	59.1%	87.1%	82.9%	53.9%	45.5%
2019	68%	64.4%	96.4%	93%	49.4%	30.4%

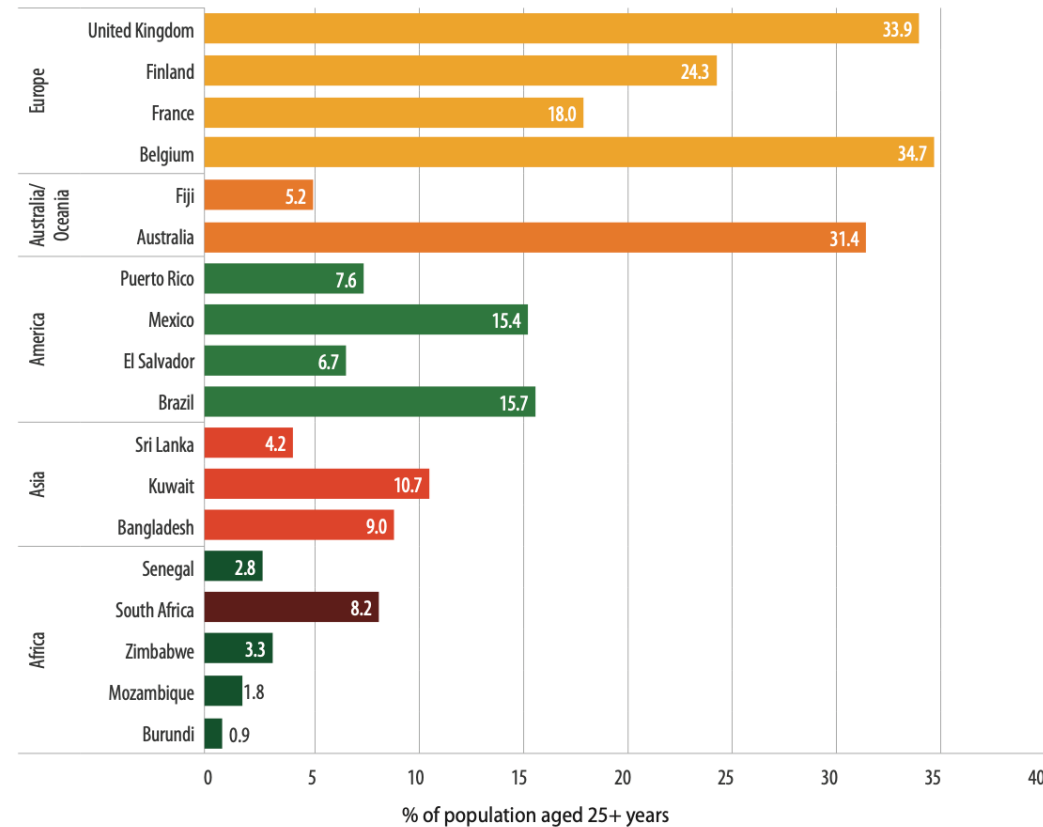
Figure 21: Certification rates 2013-2019, a comparison of TVET and Private qualifications (DHET, 2021).

Adult Education across Countries

- Sondlo (2013) explains that student retention and throughput are world-wide problems.
- For the colleges and universities in the USA, 60% of students attending 4-year programmes between 2003 and 2008 graduated within 6 years.
- Sondlo (2013) reports the following dropout rates for a few OECD countries: 19% for the UK, 37% for the USA, 28% for Germany, and 35% for Australia.
- Rothkrantz (2016) reports that while 'regular courses' have exceedingly high dropout rates, Massive Open Online Courses (MOOCs) have even higher dropout levels which may be on account of countless factors from lack of networking or social aspects to lack of support or ICT difficulties.

Adult Education across Countries

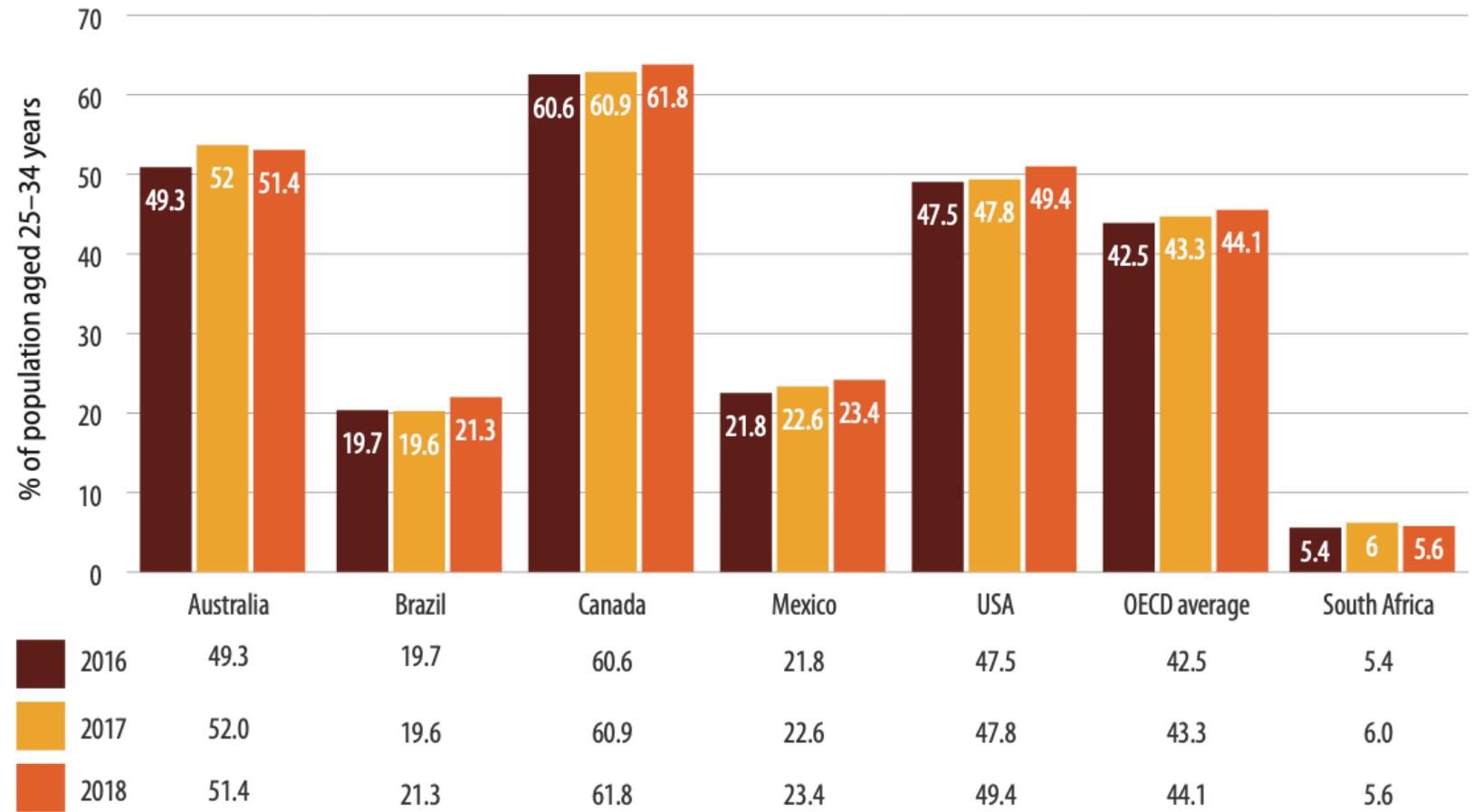
- Education levels for people above 25 years of age are significantly greater for developed countries than for developing countries.
- 33.9% of the population of the United Kingdom aged 25 and above had completed a bachelor's degree in 2017. By contrast, this figure stood at only 15.7% for Brazil and 8.2% for South Africa.



Source: World Bank Education Statistics (2020a)

Figure 1: 2017 percentages of population aged 25 years and over with at least a completed bachelor's degree

Adult Education across Countries



Source: OECD Education at a Glance: Educational Attainment and Labour-Force Status (2021a)

Figure 5: Percentage of the population aged 25-34 years with tertiary education, 2016-2018 (Khuluvhe, Netshifhefhe, Ganyaupfu & Negogogo, 2021).

South Africa's Educational and Socioeconomic Landscape

- As in other developing countries, South Africa exhibits convex returns to education. For most of the developed world this relation is concave.
- This means that increasing one's level of education in South Africa increases wage returns exponentially.
- South Africa is one of the most unequal societies in the world, with a Gini coefficient of 0.65 in 2015 (Statista).
- South Africa is plagued by inequality, economic adversity, social vulnerability, and deplorable levels of unemployment.
- South Africa's educational system is fraught with problems which continue to place constraints on its potential to uplift people from this socio-economic strife.
- Crippling deficiencies within primary and secondary education in South Africa.

Returns to Education

Country	Year of data	Primary	Middle or lower secondary	Secondary or higher secondary	Higher
Ghana	1998	8.9	8.5	8.8 ^b	16.9 ^b
Kenya	2000	11.6 ^a	---	16.4 ^b	25.5 ^b
Tanzania	2001	10.2 ^b	---	12.0 ^b	27.3 ^b
South Africa	2003	12.0 ^b	21.6 ^b	24.4 ^b	34.1 ^b
India	2004	0.0	7.2 ^b	12.6 ^b	15.6 ^b
Pakistan	2001	6.0 ^b	6.1 ^b	13.2 ^b	15.3 ^b
Indonesia	2000	5.0 ^b	8.4 ^b	13.7 ^b	17.2 ^b
China	2004	0.0	7.8 ^b	7.5 ^b	10.1 ^b
Philippines	1999	8.4 ^b	7.8 ^b	8.4 ^b	21.6 ^b
Thailand	2002	13.5 ^b	13.4 ^b	10.6 ^b	23.1 ^b
Cambodia	2004	5.3 ^b	5.6 ^b	7.7 ^b	11.1 ^a
<i>Average</i>		<i>7.4</i>	<i>9.6</i>	<i>12.3</i>	<i>19.8</i>

Notes: a and b represent statistical significance at the 10% and 5% levels respectively. Returns estimates here are reported for male waged workers of all working ages. The authors used a common methodology and also common definitions for each level of education and for the number of years of earnings forgone across the eleven countries.

Source: Kingdon et al. (2008).

Figure 4: Estimates of wage returns to different levels of education, using recent data - standardised estimates (Colclough, Kingdon & Patrinos, 2010).

Unemployment by Level of Education

	BELOW UPPER SECONDARY	UPPER SECONDARY OR NON- TERTIARY POST-SECONDARY	TERTIARY
South Africa	37	35	10
OECD average	13	7	5
Australia	10	5	3
Brazil	14	13	8
Russia	14	7	4
Indonesia	3	5	5
Italy	21	14	12
United States	10	6	2

Source: OECD Education at a Glance (2020)

Figure 2: Unemployment rates of 25-34 year olds by highest level of educational attainment (%) (Khuluvhe, Netshifhefhe, Ganyaupfu & Negogogo, 2021).

Adult Education in South Africa

- Returns to education in South Africa are exorbitant, and so post-school education and further vocational training and skills development have exceptional value.
- In addition to private wage returns, the social returns to education, in terms of the value added by educated individuals is an important hallmark of development.
- People whose parents are well-educated tend to perform better at school, as they are endowed with the cultural capital of their parents. Depken, Chiseni and Ita (2019), for example, use father's and mother's education as controls for ability bias, as this has such a noticeable effect.
- Basic education and illiteracy are levels are exceedingly low in South Africa. These deficits affect adults too, and compromise their ability to participate in the labour market effectively and gainfully. For this reason, part of the PSET system is devoted to providing adults with basic education – that is Adult Basic Education and Training (ABET). Thus, there is a strong case for the development of adult education at a foundational level, such that educational levels may develop in a cumulative fashion and move towards a more equitable distribution.
- Workplace demands are constantly evolving, given rapidly changing circumstances. This means that people – that is, adults – have had to engage in further vocational training and skills development, adopting an approach more in line with 'lifelong learning' of they wish to remain relevant and competitive in the labour market.
- Adults form the workforce and so the quality of their education and human capital impact their productivity and outputs in the labour market.
- The legacy of Apartheid cannot be ignored when accounting for the severe skills deficit within the South African labour market.
- Educational outcomes remain heavily correlated with race, gender, and socio-economic status, implying that the systems in place do not do enough to interrupt the deeply entrenched patterns of inequality and adversity.

The Determinants of Throughput in Adult Educational Programmes

- It is difficult to ascertain what contributes to low throughput as there is a lack of data about the cohorts of learners and their various personal and circumstantial factors.
- Thus, one may say that there is a great problem of endogeneity at play here and many unobservable factors which are at play in producing the relationship between inputs (educational programmes) and outputs (pass rates, and success rates thereafter).

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- *Institutional factors* are essential parts of determining throughput – referring to quality, accountability, institutional organisation, etc.
- Khuluvhe and Mathibe (2021) explain how poor throughput rates in TVET Colleges are indicative of significant *inefficiencies*, given the cost incurred in providing these qualifications.
- *Design and digital factors* are also key aspects which may help to determine the throughput rates of programmes.
- Sommer and Dumont (2011) investigate the *psychosocial factors* at play in predicting the academic performance of students at historically disadvantaged universities (typically HBIs).

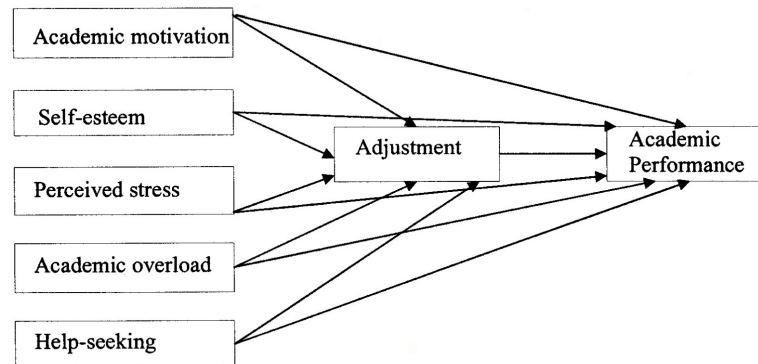


Figure 22: Model of Academic Performance (Peterson et al., 2010).

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- Throughput could also be influenced by *student decisions* other than a lack of capabilities or strife.
- Kotzé & Massyn (2019) showed that *cognitive ability* was an important indicator of academic success – more specifically, verbal cognitive ability was found to be statistically significant as a determinant across a set of ethnically-diverse adult learners.
- The vast array of learners' *personal attributes* account in large part for academic success. Ivemark and Ambrose (2021) acknowledge that *heterogeneity of student background* and access to resources has a great impact on academic and social adjustments to university.
- This brings us to the array of *demographic indicators* which act as determinants of throughput.

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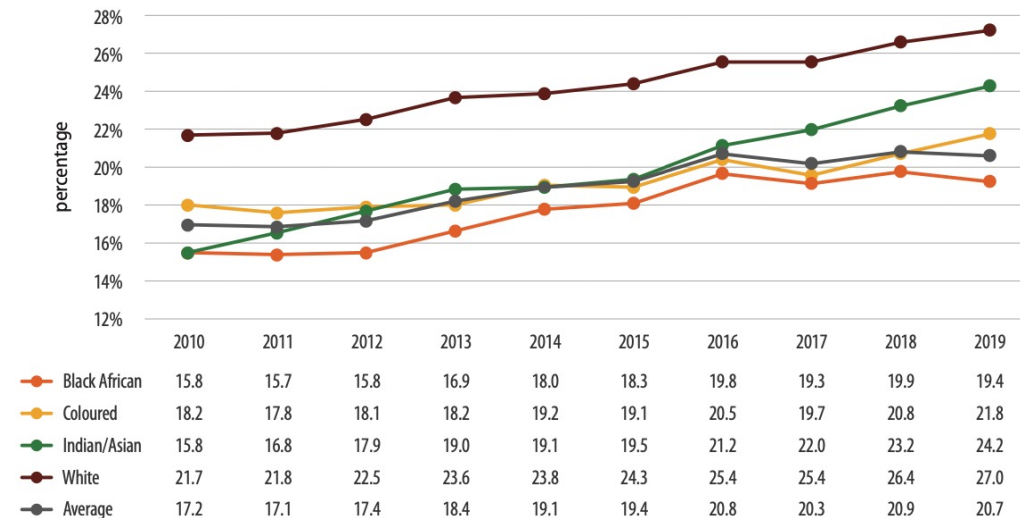
- Demographic factors are correlated with throughput rates such that one cannot ignore the role played by learner backgrounds and heterogeneity in predicting their academic success.
- Sondlo (2013) notes that dropouts and low participation rates are disproportionately higher for low socio-economic status learners in South Africa.
- Historically white institutions (HWIs) have much higher retention and throughput rates than do historically black institutions (HBIs) (Sondlo, 2013).
- Chief among the factors limiting the success of learners from *poorer economic backgrounds* is difficulty in meeting fee requirements. However, a range of associated factors may account for low throughput, such as a lack of engagement, lack of support, lack of skills development aspects, low educational quality, and poorly trained teachers (Sondlo, 2013).
- Mittelmeier, Rogaten, Long, Dalu, Gunter, Prinsloo, and Rienties (2019) find that *adjustment to online distance* undergraduate learning hinges to a significant extent upon demographic factors – specifically those of language and race. Their results showed that traditionally marginalised cohorts actually tended to adjust better through online learning.

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	NO MATRIC	MATRIC	CERTIFICATE	DIPLOMA	DEGREE	TOTAL
Black African	3 021	4 000	5 164	7 023	18 488	3 563
Coloured	3 491	4 500	4 923	5 681	18 591	3 683
Indian/Asian	4 648	5 900	20 033	14 460	19 624	7 453
White	12 216	9 668	19 337	15 107	20 142	13 132
All males	3 580	4 648	10 833	8 728	20 000	4 131
All females	2 545	3 850	4 886	7 050	18 591	3 466
Total	3 200	4 190	7 500	8 000	19 135	3 822

Source: Stats SA QLFS (2019)

Figure 15: Median wages per month by race, gender, and highest level of educational attainment, 2019 (Khuluvhe, Netshifhefhe, Ganyaupfu & Negogogo, 2021).



Source: DHET Higher Education Management Information System (2021b)

Figure 26: Graduation rates at public universities by race, 2010-2019 (DHET, 2021).

Concluding

- South Africa's educational landscape is fraught with problems.
- These problems are reflected in educational attainment levels, throughput rate, labour market outcomes and myriad other socio-economic outcomes.
- Learner heterogeneity complicates the process whereby the problems are systematically identified and addressed.
- Throughput rates are determined by various factors which require further investigation.
- Improvements in throughput rates probably require interventions in fundamental aspects of the delivery of courses, course design and pedagogical approaches, accessibility, cultural inclusivity, and much broader holistic student support.

Thank you

- Questions?
- This is a work in progress, so any feedback and suggestions are welcome.