Information Flows in the South African Post-school Education and Training sector: a focus on university and government stakeholders

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Information Flows in the South African Post-school Education and Training sector: a focus on university and government stakeholders

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Abstract

The Post-school Education and Training (PSET) system in South Africa is comprised of a diverse range of education and training institutions, and institutional types. This study provides an overview of the state of data collection, analysis, reporting and dissemination in the public universities and government agencies. The aim of the study was to build an understanding of current practices and how these can be enhanced in order to strengthen the evidence base of planning in the system. Two survey instruments (one for institutions and one for government agencies) were designed and targeted the stakeholders of interest in the PSET system to gather information. The information was analysed with reference to Terenzini's three intelligence tiers. The study revealed uneven institutional capacity across the system to operate at all three intelligence tiers with only 14 institutions demonstrating the capacity to use web-based systems to formulate targeted interventions to enhance performance. Capacity to conduct analytical research on patterns of institutional performance is also uneven. The flow of information from the DHET appears to be driven predominantly by reporting requirements. The study concludes that more attention needs to be paid to building a culture of collecting, sharing and using evidence for planning, policy and other forms of decision making.

List of acronyms

CHE	Council on Higher Education
DHET	Department of Higher Education and Training
DPME	Department of Planning, Monitoring and Evaluation
EMIS	Education Management Information System
HDSS	Health and Socio-Demographic Surveillance System
HEMIS	Higher Education Management Information System
HEQCIS	Higher Education Quality Committee Information System
HSRC	Human Sciences Research Council
INDEPTH	International Network for the Demographic Evaluation of Populations and Their Health
LMIP	Labour Market Intelligence Partnership
NEET	Not in Education, Employment, or Training
NIDS	National Income Dynamic Study
NQF	National Qualification Framework
NSFAS	National Student Financial Aid Scheme
PSET	Post-school Education and Training
QCTO	Quality Council for Trades and Occupations
SA	South Africa
SAAIR	Southern African Association for Institutional Research
SALDRU	Southern Africa Labour and Development Research Unit
SAQA	South African Qualifications Authority
SARS	South African Revenue Service
StatsSA	Statistics South Africa
TVET	Technical and Vocational Education and Training
TVETMIS	Technical and Vocational Education and Training Management Information System
UCT	University of Cape Town

1. Introduction

The White Paper for Post-school Education and Training (DHET, 2013) articulates a commitment to building a Post-school Education and Training (PSET) system that is responsive to the needs of individual citizens, employers in both the public and private sectors, and to addressing broader societal and developmental objectives (DHET, 2013).

The PSET system is made up of a diverse range of education and training institutions, and institutional types. These include institutions that support the providers of education and training, such as the Sector Education and Training Authorities, the National Skills Fund, professional bodies, and the advisory, regulatory and quality assurance bodies operating in the post-school space, namely: the South African Qualifications Authority (SAQA), the Quality Council for Trades and Occupations (QCTO) and the Council on Higher Education (CHE). The White Paper for Post-school Education and Training (DHET, 2013) envisages that all these institutions, as well as other stakeholders such as organisations representing the private sector and trade unions, will play their part to build a single, coordinated and differentiated system.

However, a report on the Evaluation of the Implementation of the National Qualifications Framework (NQF) Act from 2008 to 2016 (DHET, 2018) surfaces numerous policy implementation challenges that are hampering effective execution of transformation, redress, access, mobility, and quality teaching and learning for the beneficiaries of the post-school system. The evaluation concluded that the lack of policy coherence and effective coordination has unintended consequences for students (both those enrolled and those aspiring to enrol), individual institutions and the system as a whole. This results in a wastage of scarce human and financial resources (DHET, 2018). This characterisation of the post-school policy environment sets the context within which this study on information flows, within and between key parts of the post-school system, was planned and executed.

A systemic study of the collection, analysis, reporting and dissemination of information in public universities, TVET colleges and PSET related government departments in South Africa has not yet been undertaken. Muller et al. (2016) undertook a survey of institutional research in public universities in 2015/2016. However, only 12 of the 23 universities responded to the survey and the three newest universities were excluded (Muller et al., 2016). To address this gap the Siyaphambili project within the Southern Africa Labour and Development Research Unit (SALDRU) at the University of Cape Town (UCT) undertook a study to provide an overview of the data and research flows within and between post-school institutions, as well as between key national departments, statutory bodies and research entities and these post-school institutions.

The aim of this study is to describe the data and reports (hereafter information resources)[1] generated by key national government departments, statutory bodies, and post-school institutions in the South African PSET system and to learn how these information resources are being accessed and used by different stakeholders.

The specific questions identified for the study were:

[1] See Annexure One for Definitions of Terms

a. Who are the stakeholders creating and sharing information resources relevant to the PSET system?
b. What information resources are currently being produced and how do they map to Terenzini's (1993, 2013) three intelligence tiers?
c. Which of these information resources are being used and by whom?
d. How easy is it to access the information resources generated in different kinds of spaces?
e. What are the key challenges and future needs with regards to information resource production and use within the sector?

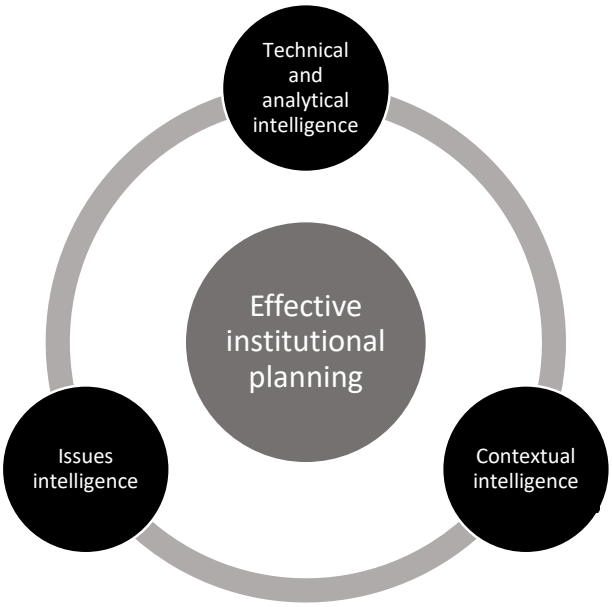
This working paper is based on an analysis of results from a survey sent to identified stakeholders. As such, it provides some important quantitative evidence that will contribute towards answering our research questions. Survey responses can, however, only get us so far in unpacking the more qualitative aspects of our research questions. We, therefore, intend this report to provide an informative base from which we can engage with stakeholders in more depth going forward.

2. Theoretical framework

Nel (2016), drawing on Shawyun and Lapin, argues that effective strategic planning in a post-school institution entails conducting an analysis of internal and external environments – political, economic, social, technological and environmental – to improve institutional performance and respond proactively to trends, events, emerging issues and possible 'wild cards' that may impact on future inputs and outputs. Developing and implementing a more integrated approach to addressing the different dimensions of planning outlined by Nel (2016), necessitates knowledge of, and easy access to, the intellectual resources generated in different kinds of spaces. It also necessitates utilising information from what Terenzini (1993, 2013) has described as three tiers of organisational intelligence.

Terenzini (1993) originally conceptualised three tiers of intelligence to describe the different types of institutional research carried out by institutional researchers in higher education institutions. In 2013, he revisited this framework to include broader sources of intelligence required for effective institutional planning.

Figure 1: Terenzini's three tiers of organisational intelligence



Terenzini's first tier of organisational intelligence is 'technical and analytical intelligence'. This intelligence is comprised of two forms. The first is the body of technical/foundational intelligence needed for operational planning, e.g. data on admissions, registration, staff and personnel. The second is the analytical abilities, e.g. knowledge of modelling tools, methods and techniques, required to solve the identified problems.

Tier two organisational intelligence or 'issues intelligence' involves research and the analysis of data and research findings to develop a deeper understanding of the organisation and work towards finding solutions to the challenges they encounter.

Tier three organisational intelligence or 'contextual intelligence' is information on the internal and external environment in which a college, university, organisation or government unit functions. This provides understanding of how an institutional environment impacts on how things are done at the institution and knowledge of the local, state, national, and international environments within which the institution must function. This layer provides intelligence on both the opportunities and constraints an institution faces For this level of intelligence, knowledge of the latest research on key performance areas of a university such as teaching and learning, admissions, student support is also deemed essential (Terenzini, 2013).

3. Method

Stakeholders within the PSET system

Siyaphambili's broad aim is to develop a hub for post-school information and research in South Africa that improves understanding of the sector and provides empirical research to inform policy development. The project described in this paper is one of the Siyaphambili sub-projects and will provide information on how best to insert the research output to reach the largest stakeholder network. As such, the study began by mapping who the key stakeholders and potential recipients of the Siyaphambili research would be.

Table 1: Key stakeholders and recipients of Siyaphambili research

Institutional stakeholders	National stakeholders	Research organisations
Executive Management	Government departments/entities	University linked
Teaching and learning development entities	National co-financing entities	Government linked
Key student support staff	National voluntary university associations	Independent entities
Key administrative staff	Independent organisations such as professional bodies or employer bodies	
Structures	National regulatory bodies	

Table 1 groups stakeholders into three main categories – institutional (universities and colleges), national and research organisation stakeholders. Each category is further divided into subcategories. For example, institutional stakeholders include those in management, teaching and learning, staff involved in student support or administration and other institutional structures such as councils, academic boards etc. Appendix Table 1 provides a complete list of stakeholders in these sub-categories.

Given that the aim of this study is to describe the information resources generated by key national government departments, statutory bodies, and post-school institutions in the South African PSET system and to learn how these information resources are being accessed and used by different stakeholders, it was decided[2] to commence the study by undertaking a baseline empirical survey of information flows within parts of the post-school system. The targeted university stakeholders for the survey included Directors/Executive Directors of Institutional Planning Departments, Directors/Senior Institutional Information Managers and Directors/Senior Managers of Institutional Research from the Management and the Key Administrative Staff categories in Table 1. Contact information was first sourced from the Southern African Association for Institutional Research (SAAIR), Quality Forum and the Higher Education Management Information System (HEMIS). Universities with missing contact information were searched for manually via university websites and social media pages. Key people were called via phone and emailed for assistance with collecting missing contact information. Up to three respondents from a single institution were contacted. The Deputy Principals (planning) of the Technical Vocational Education and Training (TVET) colleges were first targeted. However, contact

[2] The project proposal was sent for feedback to a subset of recipients who had been asked to be on a virtual working group (see Annexure Two for details).

information for the Deputy Principals was not publicly available and some TVET colleges did not have the Deputy Principal position filled. While the DHET did not have a database of contact information for the Deputy Principals of the TVET colleges, they were able to assist us with a comprehensive contact list of the Principals and Acting Principals of the TVET colleges as well as contact information of their respective personal assistants. Thus, all 50 TVET college Principals were targeted stakeholders for the survey.

The targeted national stakeholders for the survey included officials from all branches of DHET, the SAQA, the CHE, the QCTO, UMALUSI Council for Quality Assurance in General and Further Education and Training, the National Student Financial Aid Scheme (NSFAS) and the Department of Planning Monitoring and Evaluation (DPME)in the office of the Presidency.

Survey instruments

Two survey instruments were developed - one for university and TVET college staff members, and one for government officials. These survey instruments were used to gather information on the state of data collection, analysis, reporting and dissemination. We decided to focus on public post-school institutions and government, therefore, we did not survey private institutions or research entities.

The design of the research instruments was informed by the adapted version of Terenzini's three tiers of institutional intelligence (Terenzini, 2013) described in Section 2. In constructing the survey instruments, the researchers took account of the Regulations for Reporting for Public Universities[3] (DHET, 2014). The reporting framework specifies requirements in respect of the formats for, and reporting of, Annual Performance Plans including a minimum set of performance indicators within which targets for assessing institutional performance should be set. These indicators include headcount enrolments, first time entering enrolments, success rates, such as the number and field of graduates; and the number of research outputs per instructional staff. As institutions are required to report to the DHET using institutional data on these approved indicators, we assumed that all institutions had this minimum capacity and did not ask questions in the survey about institutional data collected for this purpose. Therefore, to probe activities related to tier one intelligence, questions were asked about other sources of data collected, the nature of reports compiled for institutional data overviews and the methods used for distributing these reports. To assess whether institutions were generating second tier intelligence, we asked questions about the nature of institutional research being conducted and how it related to the challenges faced by the institution. Finally, to assess whether institutions were utilising third tier intelligence, questions were asked about the use of external sources of information.

The survey instruments were reviewed by a virtual working group (see Annexure 2) as well as Mark Cramer (Information Officer at False Bay TVET College) and Jan Botha (previous Senior Director of Institutional Planning at Stellenbosch University and ex-president of the Southern African Association for Institutional Research (SAAIR)).

Survey response

After receiving approval for the study from DHET and the UCT Commerce faculty's ethics committee, the surveys were sent out in July 2019. The response rate was initially very low. The research team utilised a variety of strategies to increase response, which included asking SAAIR to encourage their

[3] Gazetted in June 2014 in terms of the Higher Education Act, 1997 (Act No. 101 of 1997).

members to respond, contacting respondents individually and requesting senior officials in government to encourage their teams to respond.

In the end, we received 33 responses from a targeted list of 46 people in universities. No responses were received from the University of Limpopo, the University of Zululand, the University of Venda and the University of Mpumalanga. We only received four responses from the targeted 50 TVET colleges. We, therefore, decided not to analyse the TVET responses. We intend to follow up with qualitative focus groups for the TVET sector in the future.

Thus, 22 of the 26 public universities responded, comprising representatives from:

- Eleven Traditional Universities;
- Seven Universities of Technology; and
- Four Comprehensive Universities.

The three institutional types[4] in the public university system are, therefore, represented in the responses. The responses include representatives from five historically disadvantaged universities (HDIs).

The survey was sent to staff in a variety of portfolios and with varying degrees of seniority. In four universities - two new universities, one historically disadvantaged University of Technology and one historically disadvantaged Traditional University - the respondents indicated that they did not know many of the answers. This suggests that the survey was not completed by an appropriate staff member. At several other institutions it appeared that the survey was completed by people who knew about practices in particular functional areas, e.g. admissions, but given that they were not part of institution-wide discussions, they were unaware of practices in all the functional areas covered by the survey. This was evident in institutions where more than one person completed the survey and responses between the junior and more senior staff members were found to be different. For the purpose of comparing responses across universities, we needed to choose one representative respondent for each institution. We, therefore, used the following rubric to pick response outcomes: definitive responses (yes or no) were chosen above don't know, with yes responses taking preference to no responses. The breakdown of the positions of the university respondents are listed in Table 2 below.[5]

[4] The 26 public universities can be categorised as 12 Traditional Universities, 8 Universities of Technology and 6 Comprehensive Universities. Traditional Universities offer theoretically orientated programmes; whereas Universities of Technology offer vocationally orientated programmes. Comprehensive Universities offer a combination of theoretically and vocationally orientated programmes.

[5] It should be noted that universities define and categorise positions differently e.g. a Director of Planning in one university may perform the same functions as an Executive Director of Planning in another university.

Table 2: Institutional position of person responding to the survey: all responses and person chosen to represent the institution

Position	All responses	Representative
Deputy Vice Chancellor	1	1
Executive Director/Director: Planning	11	9
Senior Director: Academic Affairs	1	1
Director: Monitoring, Evaluation and Research/MIS	2	1
Information Analyst/Researcher/Senior Specialist: Statistics and Analysis/Head: Business Intelligence	14	8
System Administration	1	1
HEMIS officer	2	1
Education consultant	1	0
Total	**33**	**22**

Notes to Table 2: One institution had two responses from executive directors/directors: planning. In another institution, the senior director: academic affairs was new to the institution while another respondent had a long history at the institution. In these instances, we used the response with the most complete information.

Twenty-six government surveys were distributed, and fifteen completed responses were received, a 54% response rate. The respondents are all at Director level or above.

The breakdown of responses is as follows:

- Ten from the DHET (four from the Planning Branch, two from the TVET Branch, and four from the University Branch)
- Two from the Council on Higher Education (CHE)
- Two from the Department of Planning, Monitoring and Evaluation (DPME) in the Office of the Presidency
- One from the South African Qualifications Authority (SAQA)

As such, we received no responses from three targeted government entities: QCTO, UMALUSI and NSFAS.

The study was conceptualised as a baseline empirical study. Focus group discussions are needed to probe the findings and to understand what the factors are that influence the responses that were made and how information gathered by institutions is used.

4. Analysis of the survey results

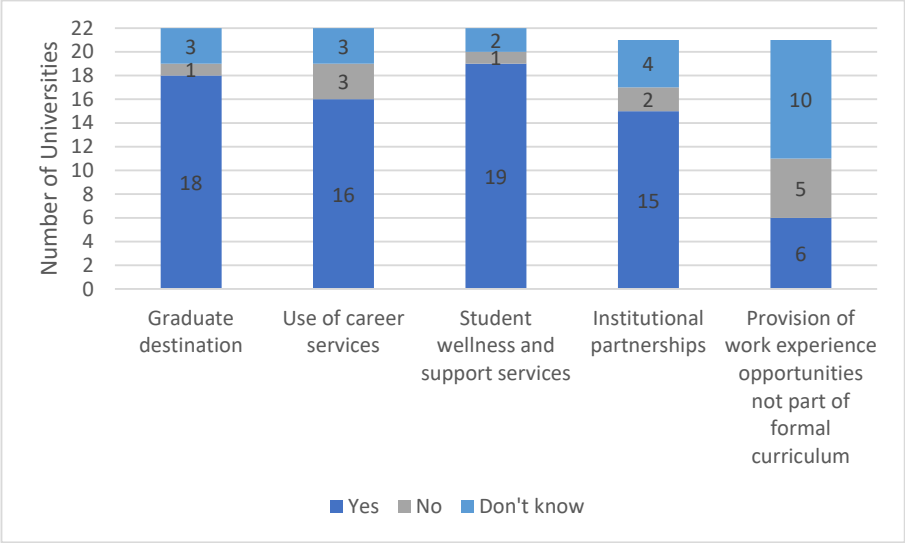
Findings from the Institutional Survey

The findings from the institutional survey are presented in relation to Terenzini's intelligence tiers outlined in section 2.

Tier One intelligence

Figure 2 illustrates responses to a question on whether an institution collected data relating to a series of topics identified as priorities for the sector in the White Paper for Post-school Education and Training and the Framework for the University Capacity Development Programme (DHET, 2017). This is not information that institutions are required to collect as part of routine reporting to the DHET. Therefore, this question provides insight into whether institutions have established systems to collect data related to national priorities outside of the DHET reporting requirements.

Figure 2: Does the university collect data on the following topics?



Notes to Figure 2: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution. Columns where the total does not sum to 22 indicate that certain institutions did not provide an answer for this question.

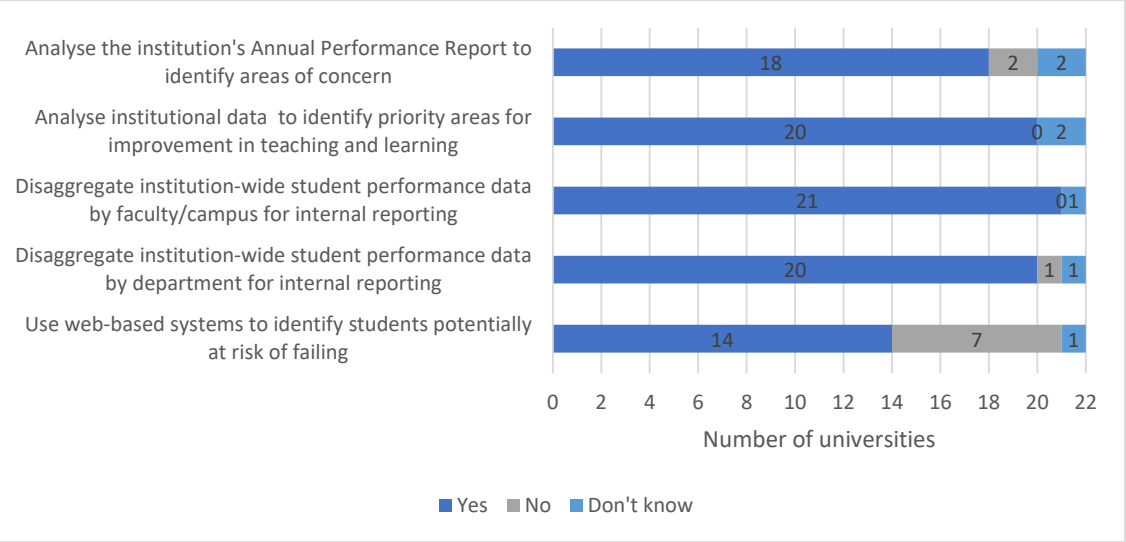
Figure 2 shows that most institutions are collecting data on all the topics put forward except for that relating to the provision of opportunities for students to gain work experience. What exactly each institution means by 'collecting data' on these topics would need to be investigated further in focus group discussions, as the high 'yes' response likely indicates a fair amount of variation in the type and value of data gathered across institutions.

Only six universities indicated that they collect data on the provision of opportunities for students to gain work experience where this was not required by the curriculum. These include four Comprehensive Universities, one University of Technology and one Traditional University. Given the premium attached to expanding opportunities for students to gain work experience in national policy goals, especially for the Universities of Technology and the Comprehensive Universities, the low number of positive responses for this question, particularly among the Universities of Technology, is a potential area of concern.

Overall, three institutions consistently responded 'no' or 'don't know' to four out of five of the questions in this series. Therefore, these institutions appear to have information systems that are lagging behind the others in the sector. These include one historically disadvantaged Traditional University, one University of Technology and one of the new universities.

The next series of questions refer to aspects of analytical tier one intelligence. Does the institution have the analytical capabilities to utilise the data collected to investigate questions of relevance? Interestingly, most institutions appear to have the analytical capabilities to identify areas that need focus. However, the first four categories do not require real time analytics (data analysed as it comes into the system or very shortly thereafter, allowing institutions to respond to challenges identified without delay). Positive responses to the use of web-based systems is lower, suggesting that the use of real time data analytics is less prevalent.

Figure 3: Does the institution have the analytical intelligence required to:



Notes to Figure 3: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution. Columns where the total does not sum to 22 indicate that certain institutions did not provide an answer for this question.

Fourteen institutions reported that they use web-based systems to identify students potentially at risk of failing, while seven indicated that they do not. The identification of students at risk of failing is critical to reduce drop out and failure rates. This presents an area where institutional analytical intelligence can grow.

In addition to asking institutions whether they collect data on specific topics, the survey asked institutions whether they produce annual reports on a range of topics. We use information on whether an institution produced two specific reports – one on the range and usage of career services and another on the usage of psycho-social support services – together with the question on the provision of opportunities for work experience, to proxy for whether universities are engaging with national priorities to enhance employability of university graduates and provide more holistic support for students.

Eight institutions, just over a third of the universities, are not yet collecting data in any of the three areas prioritised in national policy priorities mentioned above. In addition, a high number of respondents indicated that they did not know if their institution collected data on opportunities for

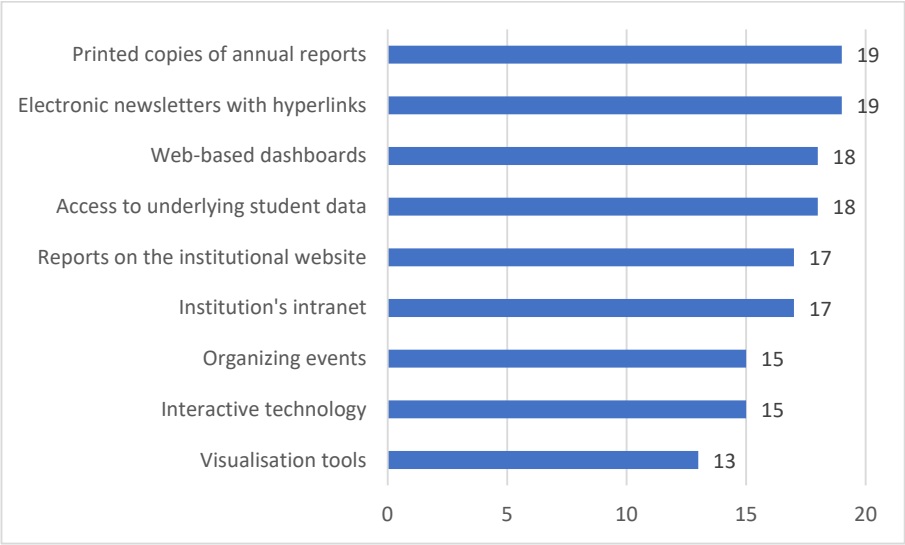
students to gain work experience (6 institutions) or produced reports on the range and usage of careers services (9 institutions) and on usage of psycho-social support to students (9 institutions). Indeed, only two institutions indicated they were collecting information on all three areas. The eight universities not collecting information include institutions from varying histories and types, indicating that capacity challenges in relation to evidence-based planning appear to cut across institutions and types.

Tier One/Tier Two intelligence

Given the nature of the survey questions, it is not possible to comment on how in-depth the annual reports produced are and whether they represent tier one or tier two intelligence. We have, therefore, incorporated the findings from these questions into a combined Tier One & Two intelligence category.

More than two thirds of the institutions (15) reported that they compiled annual reports on at least six of the nine listed topics, with the average number of reports compiled found to be six. The reports, ordered by number of 'yes' responses, cover Progress on the implementation of the institution's strategic plan (21), Transformation (19), Teaching and Learning (19), Admissions (17), Social responsiveness/Community engagement (16), Range and usage of careers services (11), Range and usage of psycho-social support for students (11), Throughput rates of students on financial aid (12), and Curriculum renewal related to decolonization (10). Significantly, 12 of the 22 institutions indicated that they reported annually on the throughput of financial aid students. This indicates a recognition of the need for specific attention to this group of students.

Figure 4: Methods used to distribute institutional information



Notes to Figure 4: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution.

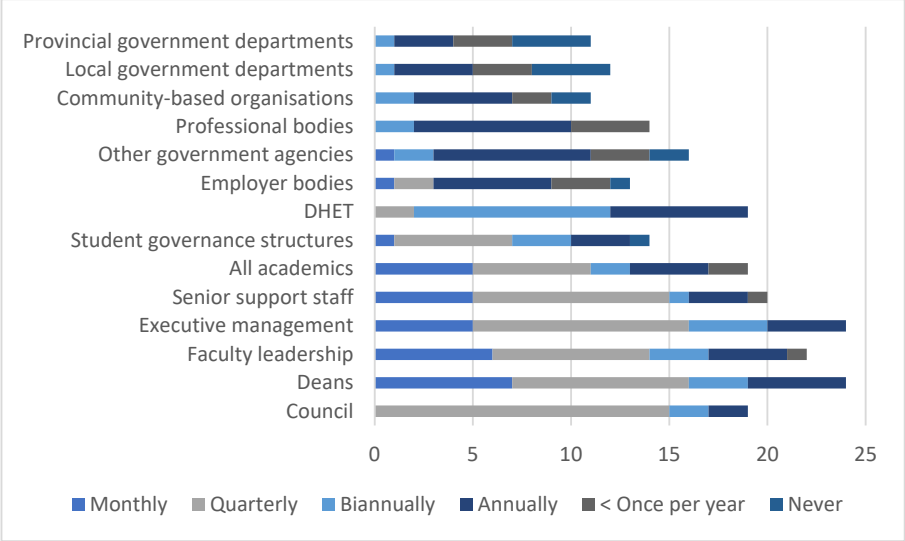
The method by which institutional information is distributed, in addition to how frequently this information is distributed to various stakeholders, provides further information for us to attempt to distinguish between tier one and tier two activities.

Figure 4 shows that the top two methods used to distribute institutional information are printed reports and electronic newsletters; 19 of the 22 institutional respondents indicated that they used these methods. These commonly used relatively 'static' distribution methods are followed closely by more

interactive methods – dashboards and access to underlying data. Interestingly, however, visualisation and interactive technology are used less frequently.

Figure 5 shows the frequency with which institutional information is distributed to various stakeholders. Not all respondents provided a response about all stakeholders as was intended. It is likely that those stakeholders without a response should have indicated the 'never' category, but some might be 'don't knows' or 'refused'. Therefore, we do not specify them as 'never' in Figure 5. There is a distinct difference in the frequency of response to internal versus external stakeholders as may be expected. More than half of institutions report monthly or quarterly to councils, deans, executive management, faculty leadership, senior support staff and academics. Most institutions report to the DHET biannually or annually as required, with two institutions indicating that they report to DHET quarterly. Three institutions did not respond to the question about the frequency with which they report to DHET. Engagement with stakeholders outside the institution, with the exception of the DHET, happens less frequently. For example, only seven institutions indicated that they distribute institutional information to provincial government departments in any of the timeframes provided.

Figure 5: Frequency of distribution by stakeholder



Notes to Figure 5: The sample includes one response per institution. The bars sum to more than 22 as institutions had the option of indicating that they distribute information in more than one time frames e.g. monthly and annually. The question intended for respondents to provide information about each report, responding 'never' if they do not report to a stakeholder. However, it is evident from Figure 5 that this was not followed. Given that no response was provided we do not know whether these are in fact never, don't know or refused responses.

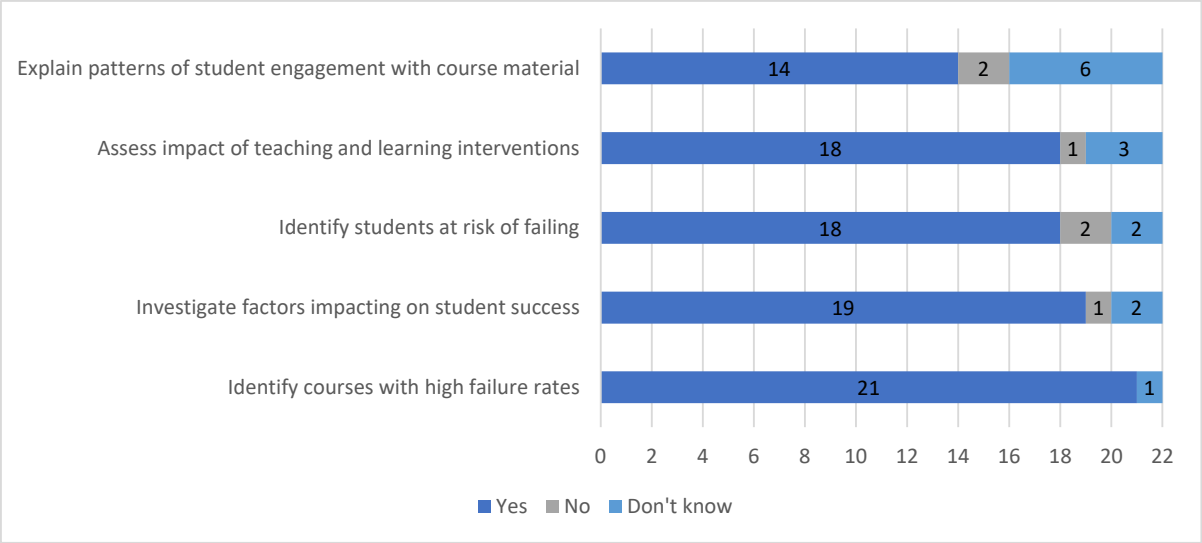
Tier Two intelligence

Responses to the questions on the use of student analytics together with responses on the type of institutional research conducted in the three years prior to the survey, serve as indicators of activities related to Tier two intelligence. Figure 6 illustrates the responses to questions about the use of data analytics to assess various institutional concerns and Figure 7 to those about institutional research.

'Yes' responses in Figure 6 indicate where data analytics are being used to develop a deeper understanding of factors impacting on student learning. The number of positive responses is high, but here again, it is unclear how informative and timely this information is and whether institutions can use the intelligence produced to impact student learning. We would need to understand the nature of data

analytics used in order to accurately determine whether the knowledge generated is sufficiently analytical to be classified as tier two intelligence or not.

Figure 6: Uses for analytics (defined as specialised technological/scientific processes)



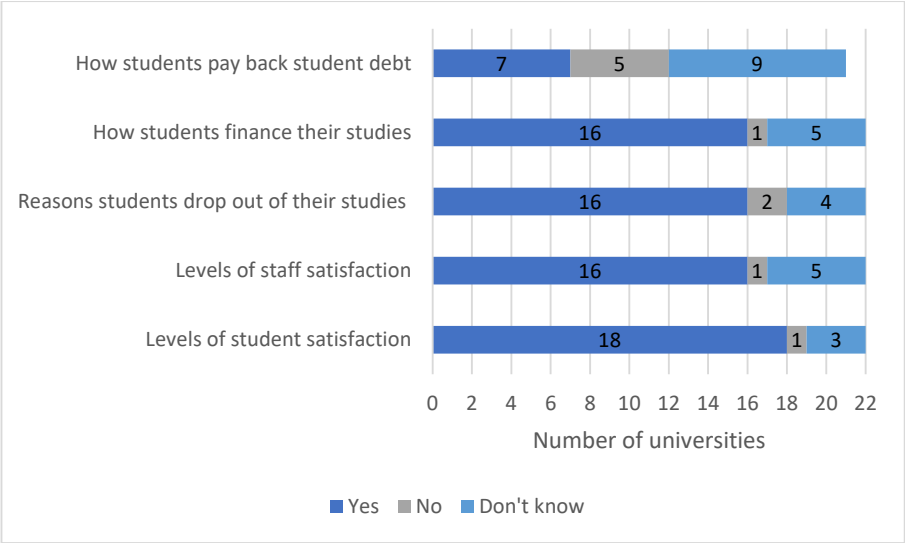
Notes to Figure 6: The sample includes 22 institutions. Yes, followed by no answers are given preference over don't know responses for institutions with multiple respondents.

Analysis of the responses to this question in the survey suggests that three universities may not yet have the technological capacity to do more complex data analytics.[6] These include one Traditional University, one University of Technology, and one of the new universities. One of these institutions is a historically disadvantaged institution.

To enable an assessment of the systemic capacity to provide Tier Two intelligence, questions were also asked about the nature of institutional research undertaken by the universities in the three years prior to completing the survey. Five areas were covered.

[6] Defined as responding 'no' or 'don't know' to at least 4 out of 5 of these sub-questions.

Figure 7: Area of institutional research undertaken over the past 3 years:



Notes to Figure 7: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution. Columns where the total does not sum to 22 indicate that certain institutions did not provide an answer for this question.

Figure 7 shows that, apart from research on how students pay back debt, responses were quite consistent across the questions. Eighteen institutions had done research on levels of student satisfaction, with sixteen institutions responding that their institutions had conducted research on levels of staff satisfaction, reasons for student drop-outs, and how students finance their studies in the last three years. Only seven institutions reported to have conducted research on how students pay back debt.

Interestingly, several institutional respondents indicated that they did not know if research was being undertaken in their institutions on:

- How students pay back debt (9);
- Levels of staff satisfaction (5); and
- How students finance their studies (5).

Or whether data analytics were being used to:

- Explain patterns of student engagement with course material (6).

Furthermore, eight institutions consistently responded 'no' and 'don't know' to at least three of the five questions about institutional research. Table 3 shows that two institutions, one a comprehensive university and one a traditional university, answered 'no' or 'don't know' to all the questions. Two of the institutions identified as having limited analytical capability in Figure 6 were also found to have low research output on these topics in the past three years. We do not have enough information to speculate on the reasons for the differences in the nature of the responses.

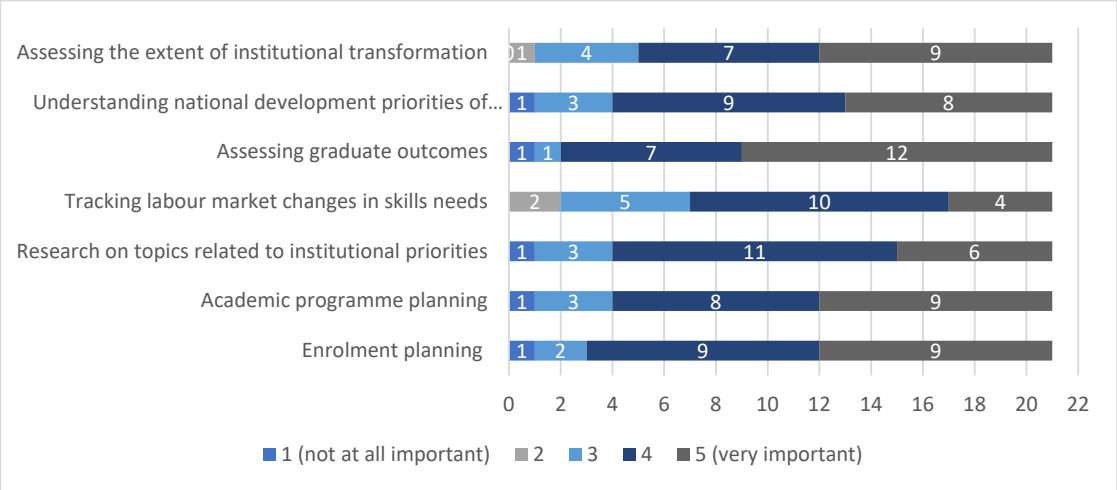
Table 3: Number of 'no' or 'don't know' responses to the five questions on institutional research

	Number of no or don't know responses			
	5	**4**	**3**	**Total**
Comprehensive Universities	1	0	0	1
Universities of Technology	0	1	2	3
Traditional Universities	1	0	3	4
Total	**2**	**1**	**5**	**8**

Tier Three intelligence

Tier three or "contextual intelligence" necessitates engagement with external sources of information including the latest research in at least a couple of substantive and functional areas. We have three relatively blunt instruments to assess this level of intelligence. First, universities were requested to rate the importance, on a 5-point scale (1- not at all important and 5- extremely important), of information/research from sources external to the institutional administration for particular functions performed by the staff in the administration. Second, universities were asked to indicate how often they make use of particular sources of information about the external environment or relevant context to their universities. Finally, universities were asked to indicate their preferences for receiving information and/or data in a range of formats from sources external to the institutional administration. Together, these three series of questions can be used to build an understanding of how institutions are valuing and engaging with 'contextual intelligence'.

Figure 8: Importance of information generated outside the university for internal functions



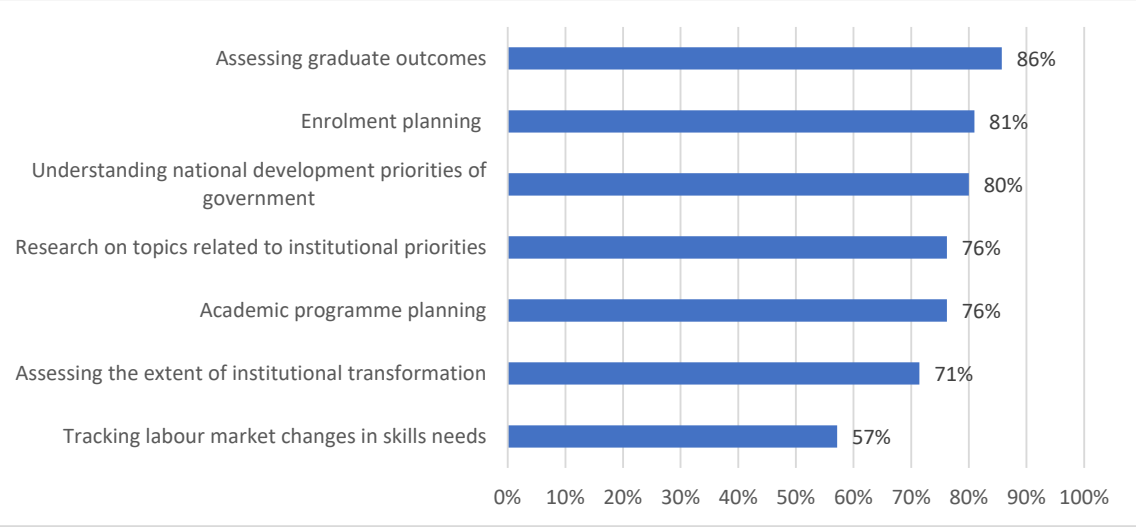
Notes to Figure 8: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution. Columns where the total does not sum to 22 indicate that certain institutions did not provide an answer for this question.

Figure 8 shows that most institutions indicated that external information was important or very important for all internal functions assessed. The function with the highest number of responses below

4 (i.e. neutral, not important or not at all important) was for tracking of labour market changes in skills needs, where 7 institutions gave responses below 4. This is surprising, particularly for the Universities of Technology and Comprehensive Universities as their missions involve the provision of programmes that are responsive to the needs of the labour market. Similarly, the applied focus of their programmes should involve the provision of opportunities for practical application of theory in workplaces.

From the question on the importance of different external resources, we classify responses of 4 (important) and 5 (very important) as 1, with responses below 4 set to zero. Figure 9 shows the percentage of institutions that rated information from external sources as important or very important for the functions listed.

Figure 9: Percentage of institutions indicating that external information is important or very important



Notes to Figure 9: The sample includes 22 institutional representatives. Responses of 4 (important) and 5 (very important) are coded as 1, with responses below 4 i.e. neutral, not important and not at all important, set to zero.

Figure 9 shows that most of the university respondents rated external information as important for the functions listed. Of all the functions, the fewest respondents rated tracking labour market changes in skills needs as important. Examining this by institution type, we find that only 50% of Traditional University respondents rate external information as important to the tracking of labour market changes in skills needs. Universities of Technology have the highest share indicating that external information is important for tracking labour market changes, which is in line with their key mandate.

The next question on use of specific information provides an indication on which external information sources[7] institutions are using to inform their internal functions – most of which have been indicated in Figure 8 to require important input from external sources. Table 4 provides a ranking of external sources, order by extent of use.

[7] Respondents were also given the opportunity to name additional resources they consult. These include the Higher Education Data Analyser peer data (PowerHEDA), Grant databases, Centre for Higher Education and Training (2), the National Research Foundation and funding agencies (2), the United Nations Educational, Scientific and Cultural Organisation (UNESCO) (2), the International Labour Organisation (ILO), and the World Bank.

Table 4: Frequency with which source accessed for information about the external environment or relevant context to your institution

		5 (Extremely frequently)	4	3	2	1 (Never)		Sample
1	The Internet (e.g. Google)	13	5	2	2	0		22
2	Higher Education Management Information System (HEMIS)	13	6	0	3	0		22
3	Websites of other universities in South Africa	2	8	8	2	1		21
4	Department of Higher Education and Training (DHET) website	4	6	7	4	1		22
5	Council on Higher Education (CHE) website	2	8	7	4	1		22
6	Academic search engines	5	9	4	1	2		21
7	Academic journals	6	8	3	3	2		22
8	Websites of post-school/university research units	3	6	6	5	2		22
9	Electronic newsletters received from research organisations and/or associations	2	4	5	8	2		21
10	Websites of other international universities	1	5	8	5	3		22
11	South African Qualifications Authority (SAQA) website	3	4	6	6	3		22
12	Other South African government department websites	0	1	8	9	3		21
13	Statistics South Africa (StatsSA) website	2	2	11	3	4		22
14	Higher education associations' websites	1	4	7	4	4		20
15	Websites of international development agencies	3	2	8	5	4		22
16	Education Management Information System (EMIS)	4	4	3	7	4		22
17	Statistics South Africa (StatsSA) data	2	3	4	9	4		22
18	Websites of universities in Africa outside of South Africa	1	5	5	6	5		22
19	Paper-based newsletters received from external agencies	2	1	2	8	8		21
20	Department of Planning, Monitoring and Evaluation (DPME) in the Presidency website	1	3	6	3	9		22
21	Technical and Vocational Education and Training Management Information System (TVETMIS)	0	0	5	6	11		22
22	National Income Dynamics Survey (NIDS) data	0	0	1	8	12		21

The top 10 external sources consulted frequently or very frequently include a mix of

- Research based and academic sources of information;
- Sources containing information on the regulatory and policy environment impacting on public universities in South Africa;
- Websites containing international comparative information; and
- Websites containing information on South African-based data linked to nationally approved indicators.

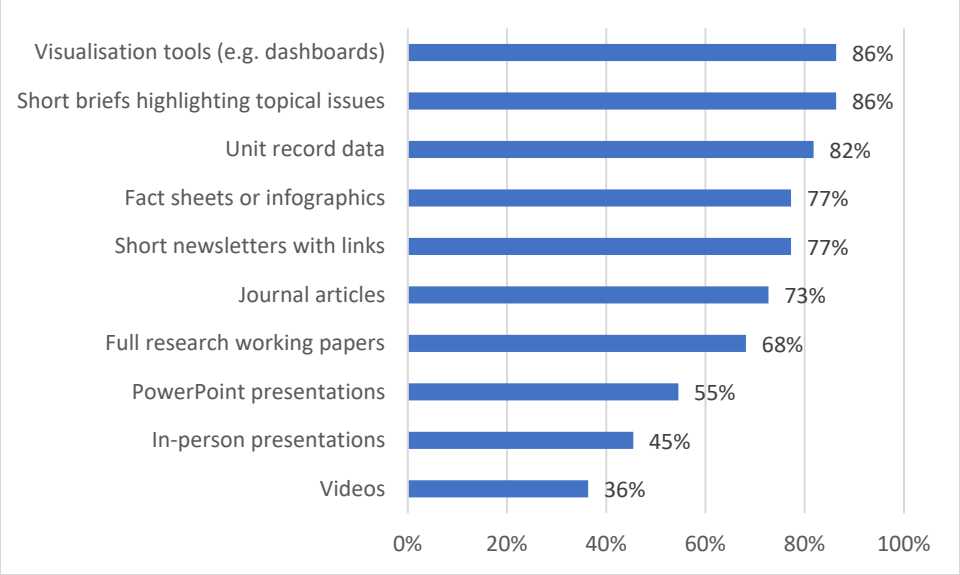
Significantly, accessing HEMIS data was listed as the most important external source of information (other than the Internet). Indeed, 19 of the 22 institutions indicated that they utilise HEMIS frequently or extremely frequently. Here again, this question needs further interrogation; how are institutions utilising the HEMIS data? Are they utilising reports compiled using the HEMIS data about their own or other institutions as well? If data about other institutions is being utilised in planning, this indicates a high degree of tier three intelligence use.

A pattern that emerges from the responses is the focus on university sector external resources. Ten of the top fifteen resources named (i.e. those listed as the top fifteen) are university sector specific. Institutions are more limited in their use of broad 'contextual intelligence' (although most institutions listed the Internet/Google as a frequent resource). On this point, very few institutions (only 4) frequently access information from the Department of Planning, Monitoring and Evaluation in the Presidency; a department whose mandate is to "facilitate, influence and support effective planning, monitoring and evaluation of government programmes aimed at improving service delivery, outcomes and impact on society".[8] The focus evident in Table 4 suggests a preference to undertake comparative benchmarking type analysis rather than a focus on learning about broader development priorities.

Finally, we asked respondents to indicate their preference for receiving external information in different formats. Figure 10 presents the identified formats along with the share of respondents indicating that they found this format favourable or extremely favourable. The respondents appear to have a strong preference for formats very close to the original data source e.g. dashboards and unit record data and other short inputs relating the data to relevant topics. Working papers and journal articles were not as popular. It is interesting to see the low preference for visual presentations and videos.

[8] https://www.dpme.gov.za/about/Pages/default.aspx

Figure 10: Percentage of respondents indicating that method is 'favourable' or 'extremely favourable'



Notes to Figure 10: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution.

Findings from the government survey

The focus of the government survey was on obtaining an overview of the nature of information generated within several government departments and agencies, and the distribution thereof; as well as identifying the sources of information used by the government departments and agencies to inform their own planning.

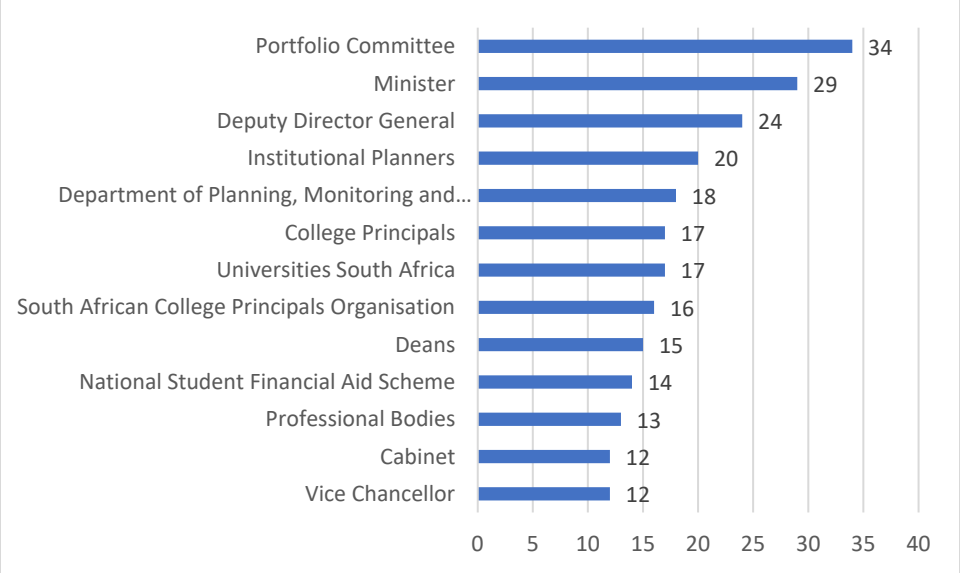
Respondents were asked to list the three major reports they produce each year in addition to the annual reports, which government entities are required to produce in compliance with the targets in their annual performance plans. The responses indicate that monitoring reports are produced on various aspects of the post-school system. This includes infrastructure funding, the financial health of universities, cohort studies, enrolment planning, research outputs, BRICS partnerships, and university governance. In addition, reports are published which provide an overview of the state of the post-school system such as the PSET Training Monitor, the PSET Macro-Indicator Trends Report, and Vital Stats for Public Higher Education in South Africa.

Respondents were asked to indicate whether each of their three main reports were distributed to a list of stakeholders. Figure 11 indicates the total number of reports sent to each stakeholder listed. We acknowledge that some reports are produced for very specific purposes and audiences, and range from operational to strategic. The totals presented in Figure 11, therefore, only provide suggestive information of the primary flows of information from the government departments and agencies to different audiences. The top three recipients can be categorised as people/entities to whom the producers of the reports are accountable. Hence, the high rating assigned to these people/entities. The limited distribution to Professional Bodies suggests that these bodies are not regarded as critical stakeholders in the post-school planning ecosystem. The DPME respondent indicated that their reports were not sent to government departments or to the universities, which seems strange given the function of that unit. The following

organisations were added as other organisations to whom copies of reports were sent: Media and Research organisations, Parliament, other government departments such as StatsSA, the Auditor General, the Director General in the Office of the Presidency, the SAQA and the CHE. These additions provide indications of how the key players in government conceptualise the post-school planning ecosystem. The reasons for the distribution patterns need to be probed further as most of the reports listed, except possibly the purely operational reports, are potentially useful for the sector.

It is worth noting the asymmetry in information flowing to portfolio committees from government officials compared to institutional planners. Most government respondents indicated that their main reports were distributed to portfolio committees, while only one university respondent indicated that they send reports to key parliamentary committees. If these committees are key in the national policy decision making process, the absence of institutional research appears short-sighted and underscores that the institutional level focus of universities.

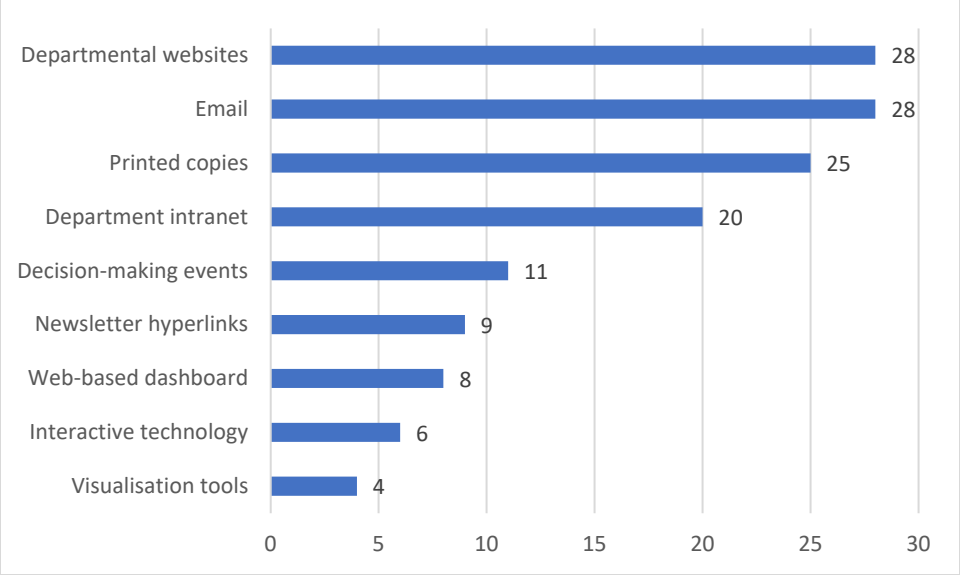
Figure 11: Number of reports by targeted audience



Notes to Figure 11: Respondents were asked to indicate the target audience for their three main reports. Not all respondents mentioned three reports, therefore the maximum number in each row is 38.

Respondents were also asked to list all methods used to distribute their main reports. Figure 12 shows the total number of times each method was chosen.

Figure 12: Number of times method indicated for distribution of reports

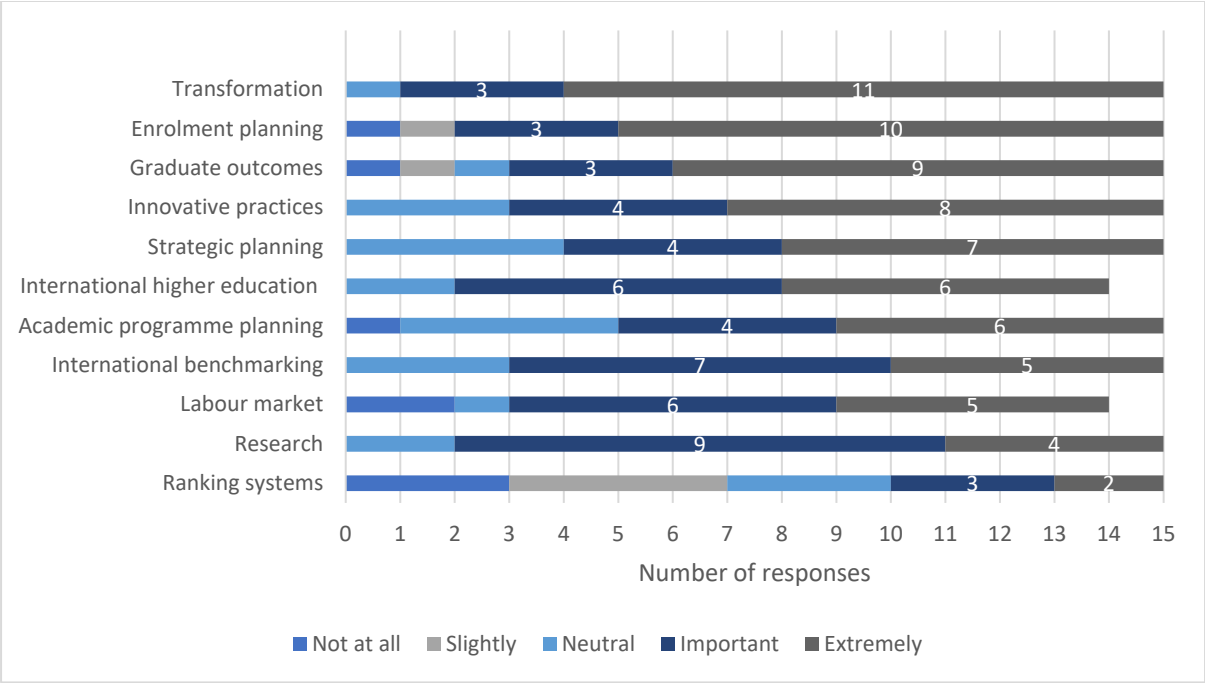


Notes to Figure 12: Respondents were asked to indicate the target audience for their three main reports. The maximum number in each row is 38 as not all respondents mentioned three reports.

Accepting that, given the nature and purpose of the reports, the methods listed may not be appropriate for all the reports, the responses suggest reliance on traditional methods of distribution of information. Figure 12 shows that respondents reported that reports placed on their websites and email were the most common distribution methods, followed by sending printed copies.

Next, respondents rated the importance of accessing information/research from sources external to their department/entity in relation to specific functions. Figure 13 shows that for all but the function of 'Keeping abreast of higher education ranking systems and the positions of South African institutions in these', respondents typically indicated that external information was important or extremely important.

Figure 13: Importance of external information for different functions



Notes to Figure 13: Respondents were asked to provide a single response. Rows with fewer than 15 responses indicate that no response was given.

Table 5 provides suggestive information on the source of external information that government officials may be accessing. In Table 5 we present a range of sources that could be used to access information together with the percentage of respondents who indicated that they used the source frequently or extremely frequently.

Table 5: Percentage of (15) respondents indicating source used 'frequently' or 'extremely frequently'

Source	
The Internet (eg Google)	87%
Department of Higher Education & Training (DHET) website	67%
Statistics South Africa (StatsSA) website	67%
Higher Education Management Information System (HEMIS)	64%
Statistics South Africa (StatsSA) data	64%
Council on Higher Education (CHE) website	53%
South African Qualifications Authority (SAQA) website	43%
Websites of post-school/university research units	40%
Websites of international development agencies	40%
Academic journals	40%
Academic search engines	33%
Technical and Vocational Education and Training Management Information System (TVETMIS)	33%
National Income Dynamics Survey (NIDS) data	33%
Other South African government department websites	29%
Websites of other universities or colleges in South Africa	27%
Electronic newsletters received from research organisation and/or associations	27%
Education Management Information System (EMIS)	27%
Department of Planning, Monitoring and Evaluation (DPME) in the Presidency website	20%
Websites of other international universities or colleges	14%
Paper-based newsletters received from external agencies	14%
Websites of universities or colleges in the rest of Africa	13%

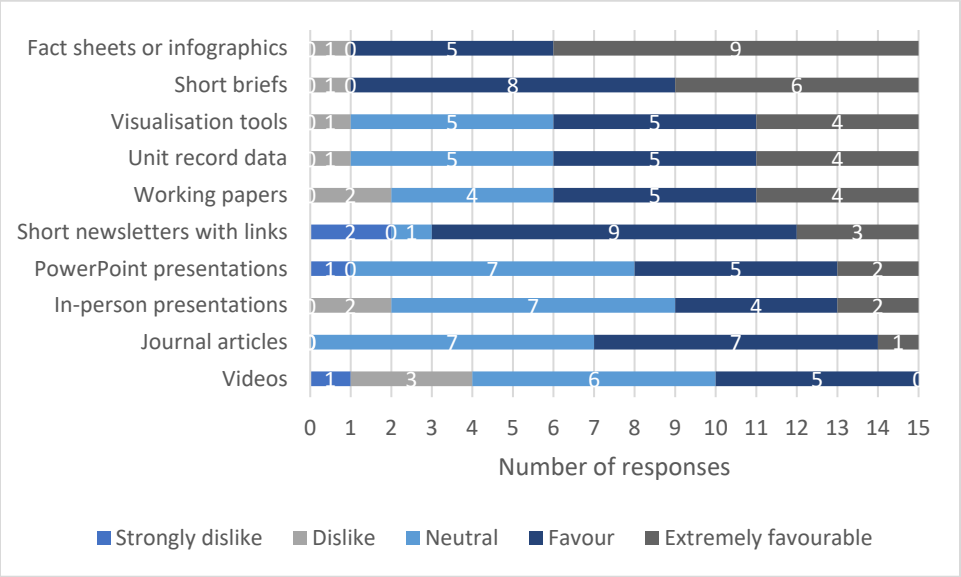
The five top ranked sources, besides the Internet, are the DHET website, HEMIS, StatsSA website and data, and CHE website. This indicates a strong reliance on data and government policy information within the sector. The low percentage of respondents accessing websites of universities in South Africa (27%), in broader Africa (13%) and internationally (14%) is significant as it suggests that post-school institutions are not perceived by the responding government representatives as important producers of information about the system. This contrasts strongly with how universities ranked information sources, where there was a strong recognition of the importance of accessing websites of other universities for benchmarking purposes. However, some respondents indicated they accessed websites of post-school and university research units (40%), electronic newsletters from research organisation/associations (27%), academic journals (40%) and search engines (33%), which together with the relatively frequent use of the StatsSA data and website suggests an appreciation of the value of contextual research and empirical data in informing the work of the government departments and entities in the post-school space.

Additional external sources listed in the other category were the Health and Socio-Demographic Surveillance System (HDSS); International Network for the Demographic Evaluation of Populations and Their Health (INDEPTH); DataFirst; the Higher Education Quality Committee Information System (HEQCIS); the Labour Market Intelligence Partnership (LMIP); the Human Sciences Research Council website; and foreign government websites.

Finally, respondents were requested to indicate their preferred formats for receiving information. Figure 14 illustrates respondents preferred formats. The two most preferred formats are fact sheets/infographics and short reports, where 14 of the 15 respondents rated this format as favourable or extremely favourable. Next were short newsletters with links. In general, Figure 14 shows a stronger preference for formats that summarise information in a written format among the government respondents than was seen in Figure

10 amongst the university respondents, where visualisation tools and unit record data were also ranked highly.

Figure 14: Rating of information provided in different formats



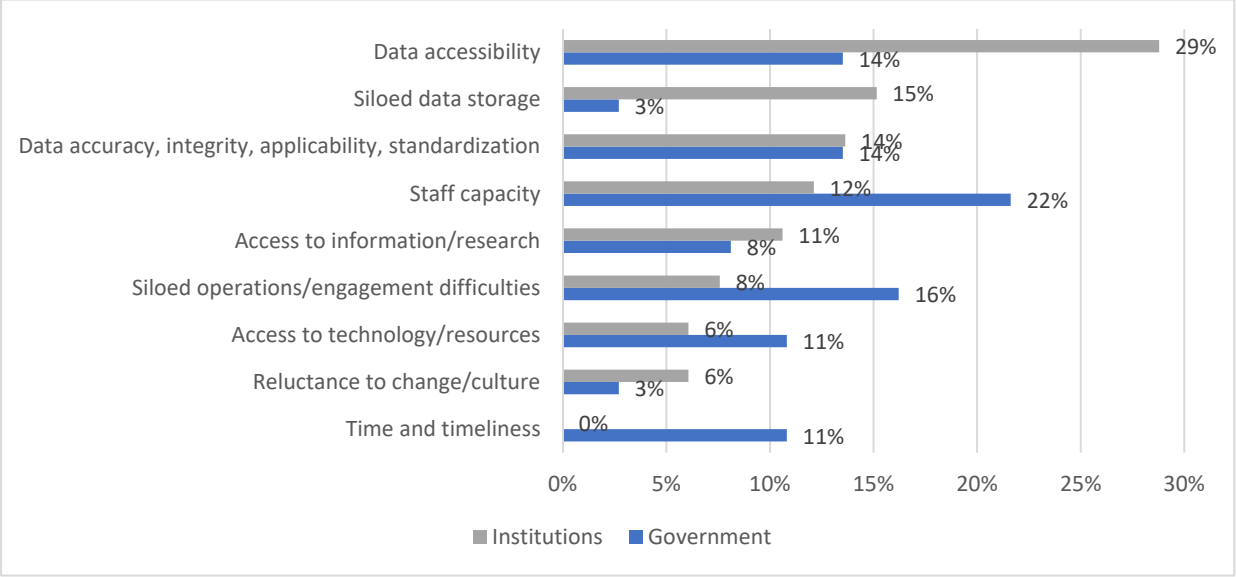
Notes to Figure 14: Respondents were asked to provide a single response. Rows with fewer than 15 responses indicate that no response was given.

Gaps, challenges, and support for DHET priorities

Our one research question is *What are the key challenges and future needs with regards to information resource production and use within the sector?* We included open-ended questions in the survey asking institutional respondents to list five major gaps in the availability and/or accessibility of information/data in relation to their role in the institution and government respondents to list three major challenges experienced in sourcing and/or distributing information. We grouped the responses into nine main categories, presented in Figure 15.[9]

[9] Note, that the question in the government and institutional surveys was not the same. Institutional representatives were asked to 'List 5 major gaps in the availability and/or accessibility of information/data in relation to your role in the institution' while government representatives were asked to 'List 3 major challenges you experience in sourcing and/or distributing information in relation to your role in government'.

Figure 15: Challenges and gaps identified



Notes to Figure 15: The figure presents the share of challenges/gaps mentioned that fall within each category. Institutions were asked to mention up to five gaps, while government respondents were asked to mention up to three challenges (see footnote 7).

It is worth noting that the fact that we could classify the gaps and challenges into nine categories shows that the challenges identified by the government departments and other entities were very similar to those identified by the institutions. A similar share of responses from both groups were around the quality and integrity of data. Institutions mentioned that information (especially on variables not required for reporting to the DHET) was not always accurate, complete or standardised across sources; while government representatives mentioned the accuracy and integrity of the data in addition to how timely the data is received (11% of challenges raised related to data timeliness and limited time).

Significantly, responses about challenges related to data accessibility (29%) were the most common among institutional respondents. These included information from other data sources (for example EMIS, matric records, NSFAS and SARS) that could be used to complement the current institutional data. In addition, and related to the second most frequently mentioned gap, was access to data from departments within the institution, for example, financial aid or financial information. Respondents mentioned that given that data was not usually stored in a central place, it was sometimes difficult to access all data necessary for a comprehensive analysis.

Accessibility to data was investigated in the survey via a question asking *'Does your institution/department have a clear institutional policy and procedure to enable members of the public to access restricted institutional information (including raw data, dashboards, strategic indicators)?'* Twelve university respondents reported that they had policies in place to govern this, with five reporting they did not and five reporting that they did not know. Similarly, most government respondents indicated that their department had a policy (10), with two stating they did not and three stating they did not know. There is, therefore, a clear misalignment between the frequency with which data accessibility was raised as a challenge or gap and the prevalence of policy/procedure to facilitate data access. This could partly be

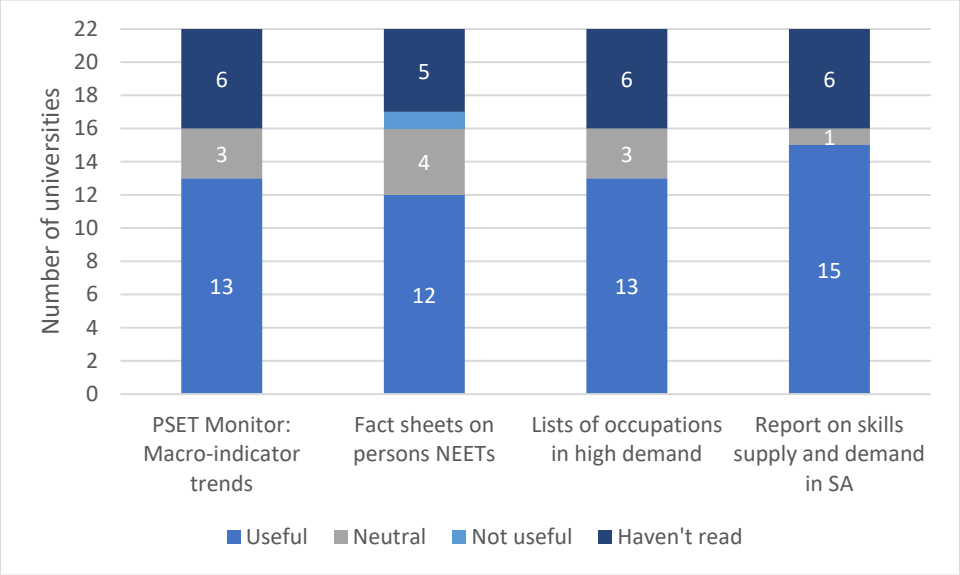
explained by the former including access to data outside of the direct PSET system (e.g. EMIS, socioeconomic data and SARS) or the format of data available to share. The Privacy of Personal Information (POPI) Act is a constraining factor here and also that the various administrative systems are not linked at national or institutional level. It would be useful to explore this further

Challenges frequently mentioned from government respondents related to staff capacity (22%), time (11%) and the absence of fora for sharing and discussing data within government departments and the sector more broadly (16%). This was echoed by some institutional respondents who mentioned that reports produced within the institutions were not well circulated within their institution, making it difficult to take a data driven approach to institutional planning and policy. Added to this, one respondent indicated that national policy was leading research instead of allowing for a collaborative effort between institutions and national policy makers.

Related to this final point, and at the request of the Planning Branch in the DHET, questions were included in the survey to provide feedback to the DHET on the perceived usefulness of four of the DHET's publications and the DHET's research priorities.

Figure 16 provides further evidence that institutions' interest in the context is, understandably, focused primarily on the university sector rather than the broader developmental sector. Of our 22 universities: 13 reported that the PSET report was useful, 12 reported that the Not in Employment, Education or Training (NEET) report was useful, 13 reported that the occupations in high demand was useful, and lastly 15 reported that the skills report was useful. Quite a large share of institutional responses (5-6) indicated that they had not read the reports, suggesting a misalignment between what the DHET sees as key information resources and what institutional stakeholders are utilising. It may also indicate that institutional planners are not aware of the reports being produced by DHET. Four institutional respondents indicated that they had not read any of the reports, and an additional four had only read one of the four reports. Given that the respondents are operating in the planning space in the post-school system, and that these reports are key sectoral planning resources, it would be useful to investigate the reasons for the responses.

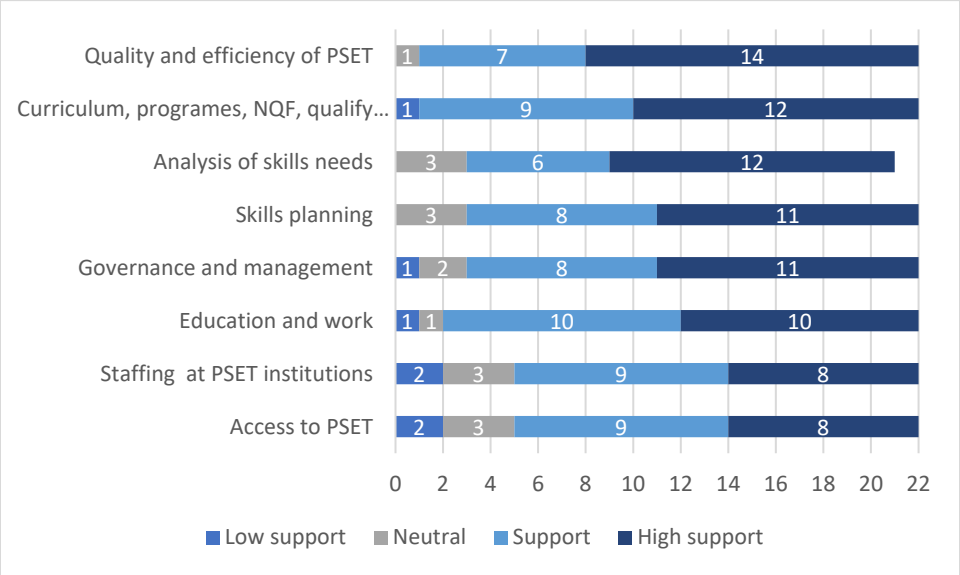
Figure 16: Responses to how usefulness four DHET reports are:



Notes to Figure 16: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution. Columns where the total does not sum to 22 indicate that certain institutions did not provide an answer for this question.

Finally, institutional respondents were asked to rate their support for the DHET's suggested research priorities for 2020 – 2023. There was overwhelming support for all the priorities, as illustrated in Figure 17.

Figure 17: Institutional support for the DHET's research priorities



Notes to Figure 17: The sample includes 22 institutional representatives. Definite responses, with a preference for yes over no, were used in the case where there were multiple respondents in an institution. Columns where the total does not sum to 22 indicate that certain institutions did not provide an answer for this question.

5. Discussion and Conclusion

This study provides an empirical overview of information flows within universities and between key government departments and entities in South Africa and the universities. However, given the positionality of several of the respondents and the inherent limitations of a purely quantitative approach to mapping information flows, it will be necessary to organise focus group discussions to investigate the practices more deeply and particularly to probe how information is actually used to enhance planning within institutions and government.

Notwithstanding these limitations the analysis of the findings, based on Terenzini's notion of three tiers of intelligence, has revealed that:

- About a third of the universities are not yet collecting data in some areas prioritised in national policy instruments but not required as part of routine reporting to DHET and four institutions may be at a very basic level. These universities include one historically advantaged Traditional University, one merged Traditional University, two new universities, one historically disadvantaged University of Technology, one historically disadvantaged Traditional University and two merged Universities of Technology, indicating that capacity challenges appear to cut across institutional types.
- Seven universities may not yet have the technological capacity to do more complex data analytics such as using web-based systems to identify students potentially at risk of failing. These include three Traditional Universities and four Universities of Technology, one a new university. Three of these institutions are historically disadvantaged institutions. It is also important to recognise that choices of what data to collect should ideally be informed by institutional priorities, clarity about the purposes for the collection of particular data, and the capacity to utilise the information gleaned from the data. Hence the observations made about differences across institutions should not be interpreted as support for expanding the use of data analytics for its own sake.
- Reports on the use of data analytics to deepen institutional understanding of a range of topics indicate that tier two activities are happening across the sector. Using this measure survey responses suggests that three universities may not yet have the technological capacity to do more complex data analytics. These include one Traditional University, one University of Technology, and one of the new universities;
- The findings suggest that there is a high level of awareness of the need to draw on a range of different sources of external information to inform planning, such as a mix of research-based and academic sources of information, information on the regulatory and policy environment impacting on public universities in South Africa, websites containing international comparative information and websites containing information on South African-based data linked to nationally approved indicators. This suggests a recognition of the importance of understanding the nature of the context within which policies and plans are developed. However, again it will be important to ascertain how this information is actually being used to strengthen the evidence base of planning in the institutions and government.
- Access to data, lack of appropriate and sufficient staff expertise as well as the institutional culture of the university were raised as challenges with regard to efforts to embed the use of information to inform policy and planning.

- Respondents identified a number of other problems which needed to be addressed in order to improve on the quality and generation of information such as the lack of data integration between systems, domains and different portfolios and stakeholders and inconsistent data definitions.
- Maximum benefit is not being derived from the monitoring reports produced in the DHET or the DPME. Several institutional respondents indicated that they had not read the DHET reports and the DPME respondents mentioned that they do not distributed their reports widely within the sector.
- Government does not appear to be frequently using institutional research that is being conducted within the universities which could assist with policy and planning at a national level.
- The sharing of information seems to be predominantly inward focused for both institutions and government.

The reasons for these patterns need to be explored further in focus group discussions.

The research conducted under the auspices of the Labour Market Intelligence Partnership highlights the importance of shifting away from a "focus on central planning mechanisms and structures, it highlights the need to build capabilities within organisations, networks and systems to be able to learn and innovate" (Kruss et al, 2019: 144). Kruss et al. (2019) suggest that this implies a strong focus on organisational learning within and between organisations that form part of an innovation systems approach.

> "Innovation system analysis offers a systems approach, mapping the main actors in key systems and subsystems, and the linkages and networks between them… It focuses on interaction, mapping flows of knowledge and resources between actors for learning and innovation. With a focus on learning, capabilities and interaction, it enables us to identify weaknesses that may lie within organisations, … including misalignment between networks, missing organisations and critical blockages of flows of knowledge and resources" (Kruss et al, 2019: 94).

An innovation system analysis provides a useful framework for identifying blockages or absences in the flows of knowledge and resources between the post-school institutions and government departments and other players in the post-school space. For example, the findings from this survey indicate that the DHET produces a number of monitoring reports which are not being shared with post-school institutions and which could potentially be very useful benchmarking resources for the system. A lot of research is taking place within institutions themselves, but it is not clear how widely the outcomes of this research are being shared or how the research is actually used to improve institutional functioning. It also appears that sharing information with professional bodies is not perceived to be of paramount importance on the part of the institutions or government departments. This may be exacerbating fragmentation in the post-school system and concerns of employers about the lack of responsiveness of the system to the needs of employers. The findings have also highlighted the lack of appropriate levels of staffing expertise and capacity as well as staff resistance to changing practices as significant challenges affecting efforts to embed evidence planning in institutions.

Many young people across the country complain about the difficulties of accessing adequate information about skills needs, training options and employment opportunities because the relevant information is located in multiple sites and determining where to look for information requires some knowledge of the various parts of the education and training system (De Lannoy et al, 2018) This study has highlighted that whilst a certain amount of sharing of information is happening, it is not clear how this information is actually being used by institutions or government departments to inform planning.

Currently the Southern African Association for Institutional Research (SAAIR) plays a major role in sharing information and findings from institutional research projects within the university sector at their annually organised Higher Education Management Information Systems (HEMIS) Institutes and Conferences. These events play a key role in helping institutional planners and researcher keep abreast of developments in DHET and the sector more broadly, but they do not necessarily reach all university staff who could potentially benefit from them. More importantly they should not be seen as a substitute for DHET-organised activities to share information and discuss new policies of relevance for the sector. For example, this study has highlighted that the new universities may not have been orientated to the nature of institutional research typically being conducted in most of the universities and this may be due to a lack of participation in SAAIR events. Finally, it is not clear whether there is any attempt by government or anyone else to raise awareness of the critical resources or sources of information within government and other key agencies which institutional planners should be drawing on in their planning processes.

The absence of an organised forum in which the multiple players in the post-school system can share intellectual resources generated in different spaces and engage in periodic evidence-based dialogue with a view to addressing any obstacles, and responding proactively to ongoing developments in the educational, political, economic, social, technological and environmental spheres has been identified by many of the respondents as a major barrier to building a single, coordinated system. This vacuum also means that institutions rely on the capabilities and networks of key professionals in their institutions to access and share relevant information and knowledge about the system. Institutions that experience severe capacity constraints in this area are not able to use planning processes effectively to address challenges impacting on student and institutional performance. This is because as Nel (2016), drawing on Shawyun and Lapin, argues, effective strategic planning in a post-school institution entails conducting an analysis of internal and external environments – political, economic, social, technological and environmental – to improve institutional performance and respond proactively to trends, events, emerging issues and possible 'wild cards' that may impact on their future. Developing and implementing a more integrated approach to addressing the different dimensions of planning, outlined by Nel (2016), necessitates knowledge of, and easy access to, the intellectual resources generated in different kinds of spaces.

Research on the use of analytics in higher education in the United States of America, the United Kingdom, Australia and India, and on the strategies that governments from forty countries in Africa, Asia, South America, North America, and Europe are using to build demand and advance the use of data and evidence in policy-making, suggests that contextually sensitive strategies are needed to produce content in formats that are relevant and easily accessible to key audiences and stakeholders (Arroway et al., 2016; Avella et al., 2016; Taddese, 2017). As Porter says, "evidence- informed policymaking is not about a specific approach or type of evidence but rather about finding ways to make better use of data and evidence in decision making. It is more of an art than a science, and the specific path or approach countries take will depend on individual contexts [taking the specific political and institutional challenges policymakers face in using data and evidence into account]" (Porter, 2011 cited in Taddese, 2017).

The implications of developing a stronger focus on contextually sensitive strategies reinforces the importance of paying attention to organisational practices and building the capacity of staff to generate and use data in their own practices in order to strengthen the evidence base of planning in the system. As one respondent in our government survey said, "We need to build the culture for using evidence for planning, policy and other forms of decision making – we do not have this culture as yet. If we don't do this we will all remain isolated in our silos or we will generate lots of information which won't be used." The inequalities between institutions are also likely to grow as a result of varying capacities in the system with regard to planning, monitoring and evaluation.

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Appendix Table 1: Stakeholders

Institutional stakeholders	National stakeholders	National research organisations
MANAGEMENT	**GOVERNMENT DEPARTMENTS/ENTITIES**	**UNIVERSITY LINKED**
Executive director: Finance	Department of Higher Education And Training (DHET)	*Education specific:*
Executive director: Student Affairs	National Student Financial Aid Scheme (NSFAS)	Centre for Higher Education Research,Teaching and Learning (CHERTL)
Executive Management	Sector Education and Training Authorities (SETAs)	Higher Education and Human Development Programme (HEHD)
Faculty Executives	Council on Higher Education (CHE)	Institute for Post-School Studies (IPSS)
TEACHING AND LEARNING	Department of Basic Education (DBE)	Centre For Researching Education and Labour (REAL)
Deputy Vice Chancellor Academic/Teaching & Learning	Provincial Education Departments	The Centre For Integrated Post-School Education And Training (CIPSET)
Curriculum Advisors	Department of Labour	*Development:*
Academic Support Lecturers	Department of Social Development (DSD)	Development Policy Research Unit (DPRU)
Deputy Deans: Undergraduate Affairs	Office of the Presidency	Southern Africa Labour Development Research Unit (SALDRU)
Institutional University Capacity Development Coordinators	Human Resources Development Council (HRDC)	**GOVERNMENT LINKED**
Coordinators Of Mentorship Programmes	**NATIONAL CO FINANCING ENTITIES**	Education And Skills Department HSRC
Heads Of Departments	Jobs Fund	Education & Training Development Practioners (ETDP) SETA
Head Of Teaching And Learning Centre	Ikusasa Student Financial Aid Programme (ISFAP)	Research Chair: Youth
KEY STUDENT SUPPORT STAFF	National Skills Fund (NSF)	**INDEPENDENT RESEARCH ENTITIES**
First Year Experience Academy Staff		Cornerstone Economic Research
Head: Financial Aid	**NATIONAL VOLUNTARY ASSOCIATIONS**	DNA Economics
Head: Student Fees Office	National body of TVET principals	
Student Wellness Staff	National youth network	
Mentors	Higher Education Learning and Teaching Association of Southern Africa (HELTASA)	
Student Counsellors	Southern African Association of Institutional Research (SAAIR)	
KEY ADMINISTRATIVE STAFF	South African College principals' Organisation (SACPO)	
Recruiting Officers At Universities	Southern African Society of Cooperative Education (SASCE)	
Registrars	South African Technology Network (SATN)	
Director: Student Finance	Universities South Africa forum (USAf)	
Institutional Information Officer	USAf teaching & learning committee	
Institutional Planning Departments	Siyaphumelela	
Institutional Researchers	National careers service directors	
ICTs staff involved in identifying students at risk	**INDEPENDENT ORGANISATIONS**	
STRUCTURES	South African Institute of Distance Education (saide)	
Academic Boards	**NATIONAL REGULATORY BODIES**	
Financial Appeals Committee	Professional Bodies	
Senate		
Student Representative Council		
Student Faculty Councils		
Student Parliament		
Teaching and Learning committee		
Admissions Committee		
Council		

Annexure One: Definitions terms

A survey of literature in this field undertaken by Avella et al. in 2016 found that learning analytics, educational data mining, and academic/institutional analytics are closely related concepts and are often used interchangeably (Bienkowski, Feng, & Means, 2012; Elias, 2011 cited in Avella et al., 2016). Drawing on the outcomes of this literature review for the purposes of this study the following definitions are used.

Data refers to administrative institutional data as well as quantitative and qualitative information gleaned from comparative studies, qualitative investigations or evaluations, websites, benchmarking, surveys, and performance reports.

Analytics refers to the scientific process that examines data to formulate conclusions and to present paths to make decisions, such as statistical techniques and predictive modelling (Picciano, 2012 cited in Avella et al., 2016).

Academic/institutional analytics refers to the collection and analysis of data – generally from different data sources with the goal of improving educational institutions' decision-making and performance (Campbell, De Blois, & Oblinger, 2007 cited in Avella et al., 2016).

Learning analytics refers to the process of systematically collecting and analyzing large data sets from online sources for the purpose of improving learning processes. Learning analytics uses predictive models that provide actionable information. It is a multidisciplinary approach based on data processing, technology-learning enhancement, educational data mining, and visualization (Scheffel, Drachsler, Stoyanov, & Specht, 2014 cited in Avella et al., 2016).

Research, drawing on Tiechler, covers discipline-based research by occasional researchers e.g. economists, research in the academic discipline devoted to post-school education and training, analysis by researchers in research units, applied (institutional) researchers whose work is determined by its utility for institutional decision-making, and reflections of practitioners e.g. senior managers in universities (Botha et al., 2016).

Annexure Two: Virtual Working Group

Jean Skene, Department of Higher Education and Training (DHET)
Jennie Glennie, Southern African Institute of Distance Education (Saide)
Suellen Shay, University of Cape Town (UCT)
Jane Hendry, University of Cape Town (UCT)
Ahmed Bawa, Universities South Africa (USAf)
Hersheela Narsee, Department of Higher Education and Training (DHET)

SALDRU

Southern Africa Labour and Development Research Unit

The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy. In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.

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