LEARNING ANALYTICS: A SOUTH AFRICAN HIGHER EDUCATION PERSPECTIVE

A few steps on an analytics journey

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Presentation Outline

- Introduction to the research
- Establishing a common language
  - Closer look at Analytics
- Framework - Critical dimensions of learning analytics by Greller and Drachsler
- Survey questions and dimensions
- Rubric
- Results
- Closing the loop
- Future research

Introduction

- The Learning Analytical context is still in its infancy in South Africa but multiple institutions are displaying promising practices pertaining to the further development of the research field.

- This lead to the conceptualisation of this research project, which directly stems from the inaugural SAHELA conference in 2013.

- The SAHELA 2013 participating institutional representatives were approached to provide detail as to the further development of an Learning Analytical culture at their institutions.

Closer look at Analytics

- From an educational perspective the concept of “analytics” in general is not a new phenomena. The introduction of the concept of Learning Analytics is however seen as a global new driver enforcing data driven decision making.

What is Academic Analytics?

“Academic analytics (AA) is the improvement of organizational processes, workflows, resource allocation, and institutional measurement through the use of learner, academic, and institutional data”

What is Learning Analytics?

“Learning analytics (LA) is the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs”

Closer look at Analytics

- What distinguishes Learning Analytics from Academic Analytics?

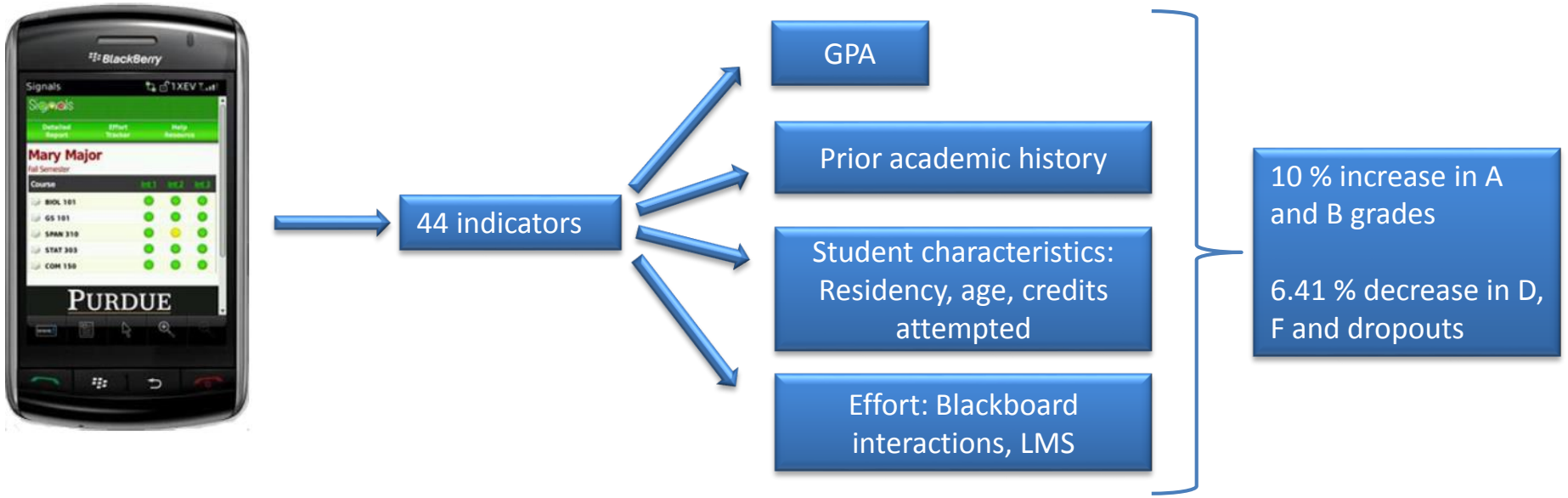
Learning and Academic Analytics

Type of Analytics	Level or Object of Analysis	Who Benefits?
Learning Analytics	**Course-level**: social networks, conceptual development, discourse analysis, "intelligent curriculum"	Learners, faculty
	Departmental: predictive modeling, patterns of success/ failure	Learners, faculty
Academic Analytics	**Institutional**: learner profiles, performance of academics, knowledge flow	Administrators, funders, marketing
	Regional (state/provincial): comparisons between systems	Funders, administrators
	National and International	National governments, education authorities

Table 1. Learning and Academic Analytics. (Siemens & Long, 20121 pp. 34).

Practical Learning Analytics

Purdue University developed the “Course Signals” application that marries multiple data sources about students in an effort to optimise student success.



Critical dimensions of Learning Analytics

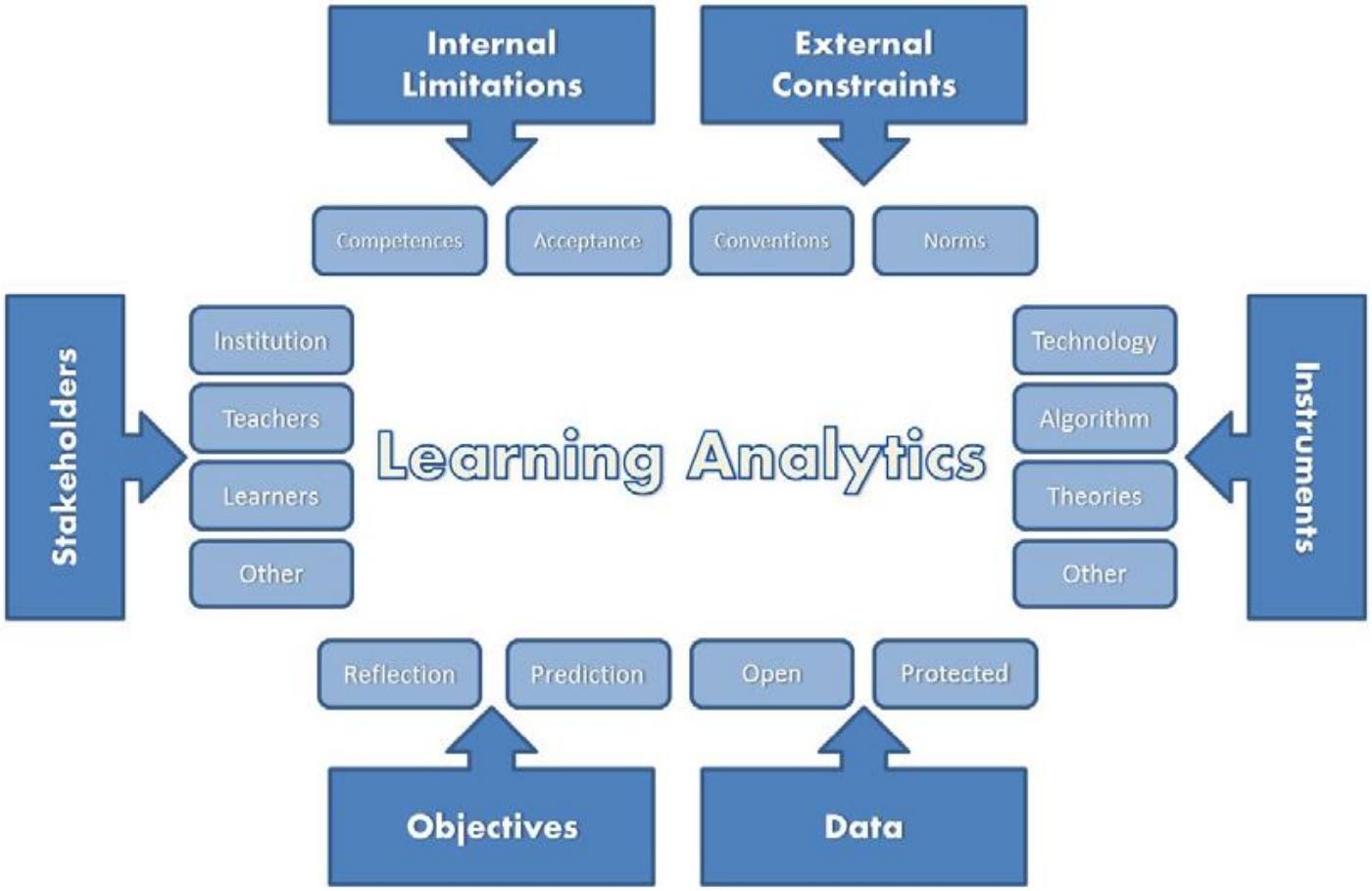


Figure 1. Critical dimensions of learning analytics. (Geller & Drachsler, 2012, pp. 44).

Participants

2

1

3

2

1

1

1

2

Survey Dimensions

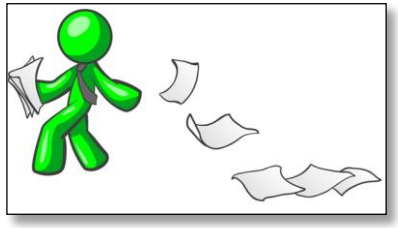
Stakeholders

Where are analytics located in the institution?
Who are the various stakeholders that benefits from the analytics? (e.g. data used to assist students, faculties/schools, departments, institutions…)

Objectives

What are the objectives of analytics at your institution? (E.g. descriptive and/or predictive)?

Data



What data is being collected? (e.g. learner characteristics, engagement, interventions, evaluations)
Are there specific times and events used to collect student and institutional level data?

Survey Dimensions

Limitations

Are staffs responsible for the analytics trained and knowledgeable?

Instruments

What analytics systems are being used? (E.g. Vendor products or in-house developed systems)
What analytical tools and dashboards are available? (e.g. tracking of students performance and attendance)

Constraints

What processes does the institution have in place to deal with any legal or ethical issues surrounding analytics and the use of student data?
Who has access to the data? (this includes student survey data, institutional level data and LMS data)

Survey Dimensions

Evidence of outcomes

Are there any outcomes or achievements with regards to incorporating analytics at your institution to date?
What interventions are taken as a result of the analytics? (E.g. data collected from students informed the implementation of a mentoring programme)

Further developments

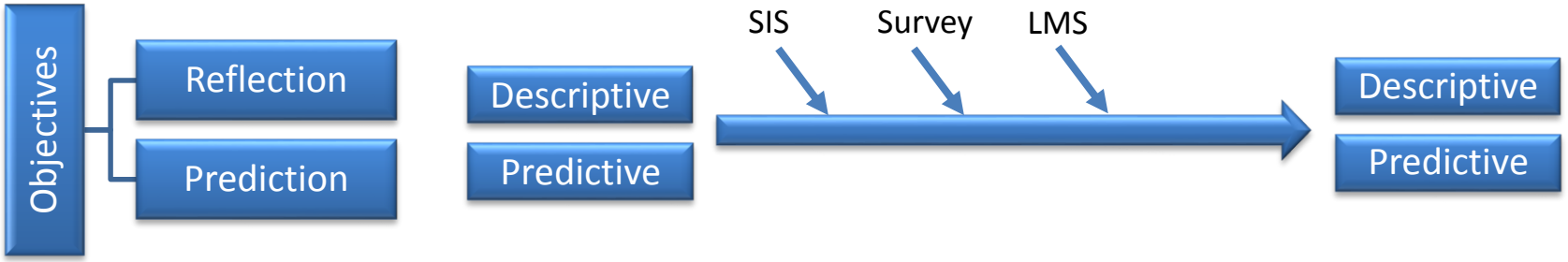
Moving forward, are there any future analytical driven innovations that aim to use student data to optimise their success?

Rubric

- The rubric conceptualised by Greller and Drachsler was adopted for this research study:
  - Each dimension is sub divided into factors contributing towards each respective dimension
  - The rubric is further constructed through assigning a score to each factor based on the movement from higher level to a micro level of analysis

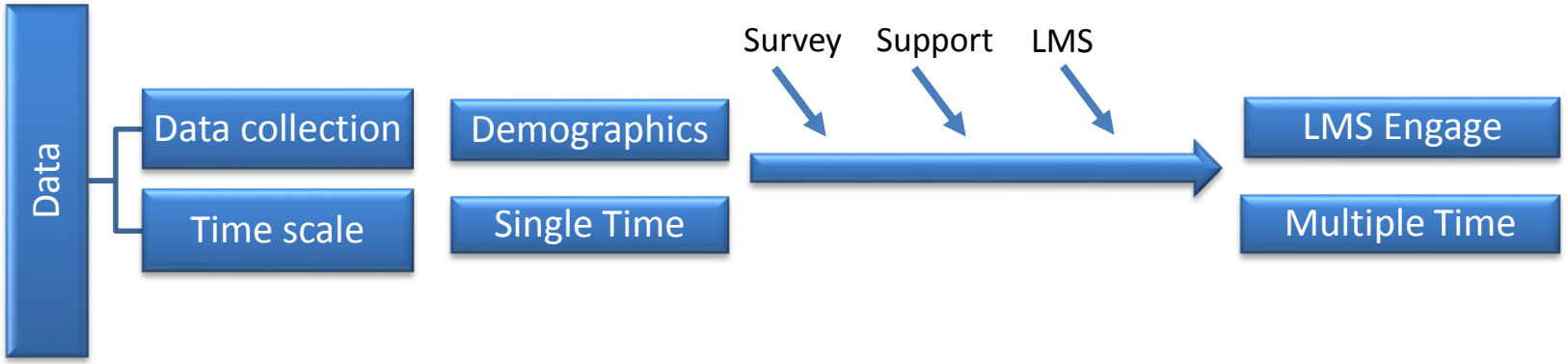
Rubric

Stakeholder: As the system matures, the stakeholders move from a meso level to a micro level and as the practices move from a highly decentralised data environment to a controlled centralised data environment as the system starts combatting data silos

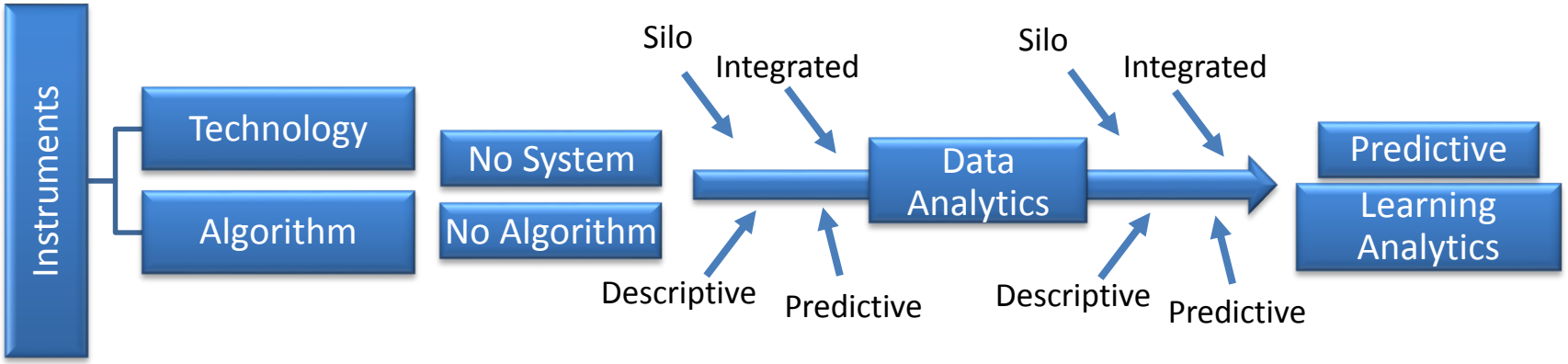


Objectives: The concept of Learning Analytics as part of the “big data” movement is to consolidate multiple data sources to provide a broader understanding of stakeholders. As the objectives strengthen the system included multiple sources over various time intervals moving towards a more “real time” condition of data

Rubric

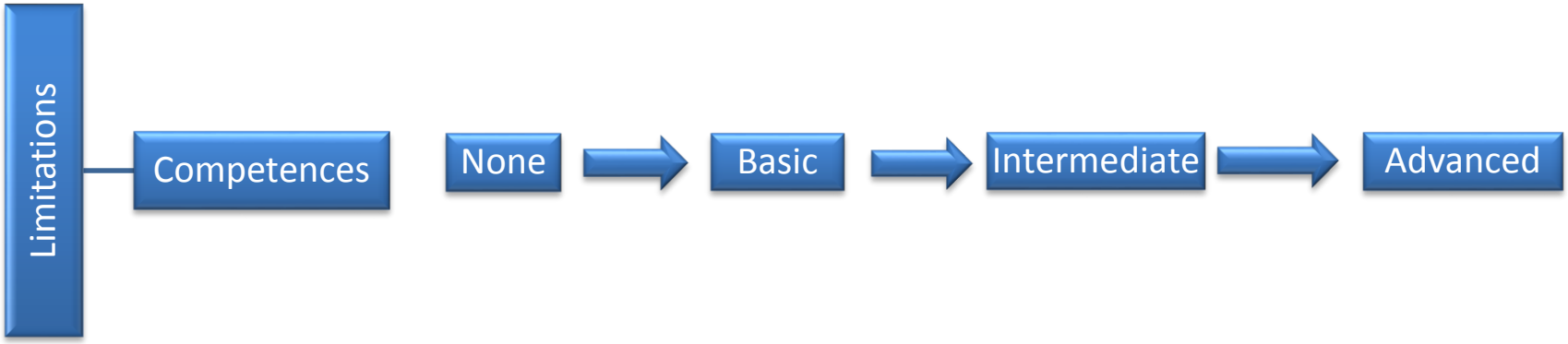


Data: To explore the abilities of Learning Analytics is to engage with more data and more frequently. This dimension as it matures move from a single to more complex data source and from a single point of data collection to a multiple time stamp

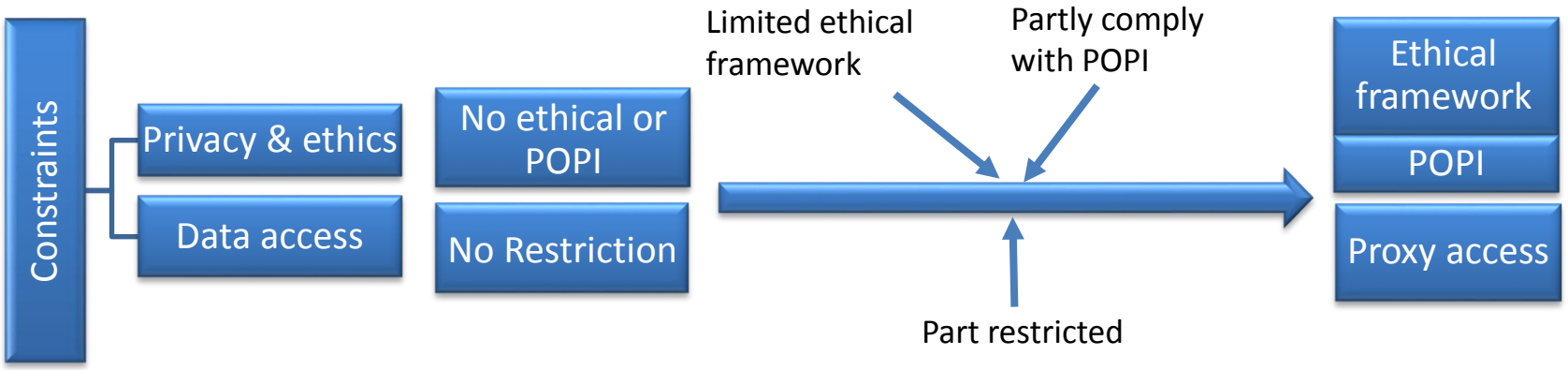


Instruments plays a pivotal role and its critical to reflect on the systems and methodology we use in an effort to better understand our students. This dimension matures from a Data Analytical focus to a predictive Learning Analytical focus

Rubric



Limitations: Capacity development internally to an institution can be a tremendous task and creating a culture of evidence and adopting analytical tools and techniques can be a limiting factor

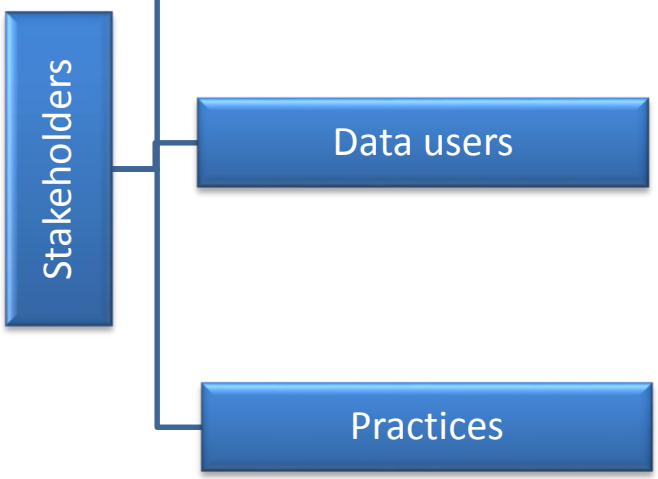


Constraints: Two major constraints to the evolution of Learning Analytics is the sensitive matter of ethics and the governance of student data

Results

Results: Stakeholders

- Where are analytics located in the institution?
- Who are the various stakeholders that benefits from the analytics?



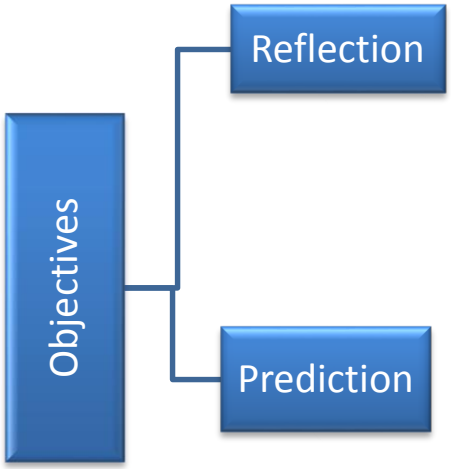
Institutional	Professional and support	Faculty	Lecturer	Student
8	8	6	1	0

Institutional	Professional and support	Faculty	Lecturer	Student
8	8	8	5	2

Data to select few	Data are disseminated to end-users	Data shared to all stakeholders
0	5	3

Results: Objectives

- What are the objectives of analytics at your institution? (E.g. descriptive and/or predictive)?

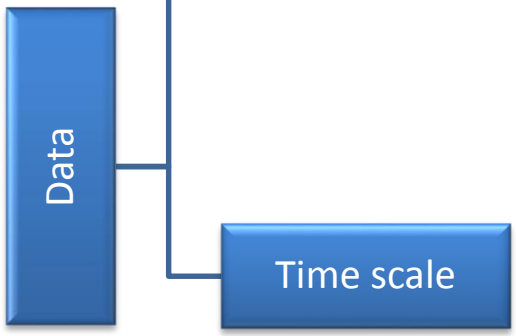


Management Information System (MIS)	MIS and Student Information System (SIS)	Survey data	LMS	MIS, SIS, Survey and LMS over time
8	8	6	5	0

Management Information System (MIS)	MIS and Student Information System (SIS)	Survey data	LMS	MIS, SIS, Survey and LMS over time
8	8	7	1	0

Results: Data

- What data are being collected?
- Are there specific times and events used to collect student and institutional level data?

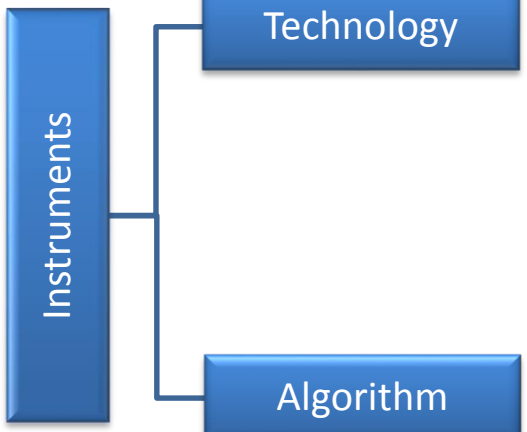


Management Information System (MIS)	MIS and Student Information System (SIS)	Survey data	LMS	MIS, SIS, Survey and LMS over time
8	8	7	5	0

Single time stamp MIS	Single time stamp survey data	Multiple time stamp survey data	Single time stamp LMS	Multiple time stamp LMS
8	8	7	5	0

Results: Instruments

- What analytics systems are being used?
- What analytical tools and dashboards are available?

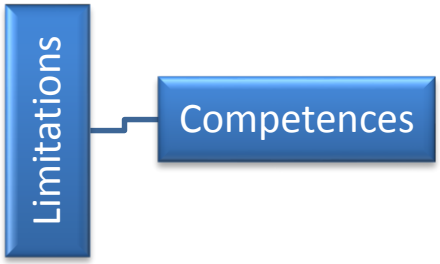


No analytical system	Silo systems for data analytics	Integrated systems for data analytics	Silo systems for learning analytics	Integrated systems for learning analytics
0	0	4	3	1

No algorithm	Descriptive data analytics	Predictive data analytics	Descriptive learning analytics	Predictive learning analytics
0	8	2	3	1

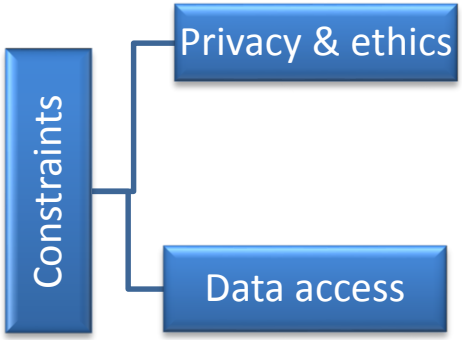
Results: Limitations and Constraints

- Are staffs responsible for the analytics trained and knowledgeable?



N/A	Basic	Intermediate	Advanced
2	1	3	2

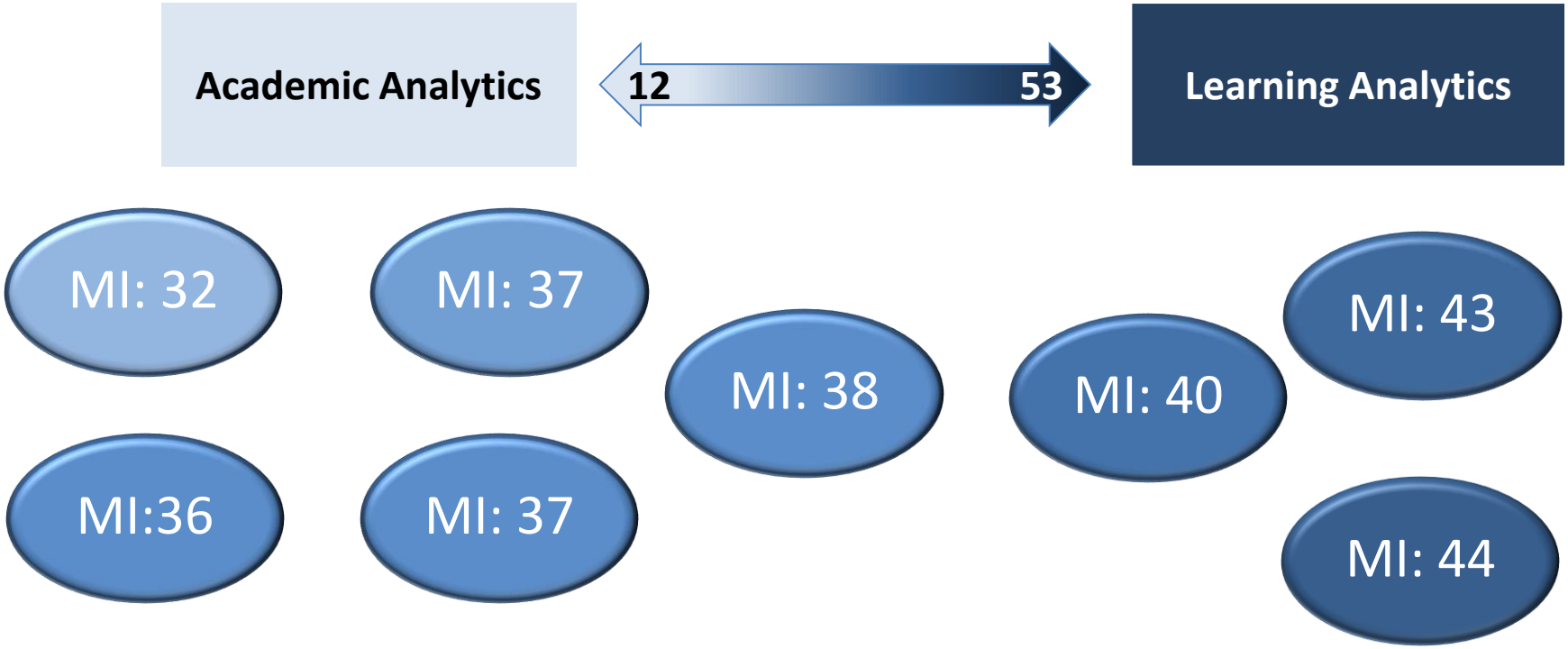
- What processes does the institution have in place to deal with any legal or ethical issues surrounding analytics and the use of student data?
- Who has access to the data?



No ethical Framework	Part ethical framework and POPI	Full ethical framework and POPI
0	2	6

Unrestricted access to data	Part restricted access	Proxy access by user
0	3	5

Analytics Maturity Index (MI)



Data-driven decisions: Interventions

- Alternate degree recommendation
- Academic advising
- Academic staff development
- Counselling
- Evaluation of assessments
- First year experience programme

Evidence of outcomes

- Reflection on data
- Success rate improve
- Decision making
- Create awareness on students
- Changes to support programme
- Improved data capturing

Institutional short term plans

- Learner analytics
- Module evaluation and support
- Siyaphumelela project
- Student success models
- Student academic advising
- Incorporate programme in strategy

Suggestions on transitioning from concept to implementation

- Use the six dimensions of the LA framework together with the proposed rubric to evaluate at an operational level to support with the implementation of LA in an educational beneficial way. *NOT an either AA or LA > Learner Analytics*
- Understand what data is measured and make the connections
- SMART data
- Interventions were inferred from data > outcomes NOT assessed – Planning for outcomes assessment prior to embarking on the intervention
- ‘Sophistication of the analytics system is not in centralisation but rather decentralisation’ (Jan Lyddon)

Thank you

"It is not enough to simply intervene; the intervention must be imbued with intelligence, as must the LA reports that trigger interventions in the first place"

References

- Greller, W., & Drachsler, H. (2012). Translating learning into numbers: A generic framework for learning analytics. Journal of Educational Technology & Society, 15(3), 42-57.
- Scalter, N., (2015). Refining a systems architecture for learning analytics.
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- Phil Long and George Siemens, “Penetrating the Fog: Analytics in Learning and Education,” *EDUCAUSE Review* 46, no. 5 (September/October 2011), 34.