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A Model to measure Academic Performance of Private Higher Education Institutions

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ABSTRACT

This article postulates a model to measure the academic performance of a private higher education institution in South Africa. The broad theoretical framework identified eighteen antecedents and its respective measuring criteria to measure academic performance. Statistical scrutiny ensured that these criteria are actual measures of the respective academic performance antecedents which culminated in a theoretical model to measure the academic performance of private higher education in South Africa. The eighteen academic performance antecedents are Economic factors, Selectivity, expenditure and retention, Parent income level, attitudes and expectations, Motivation, Workload, External forces, Self-efficacy, Help seeking, Attendance, Affective factors, Self-concept, Self-esteem, Stress, Active learning, Extracurricular activities, Adjustment, Class size, and General measures of academic performance. The results showed that all the antecedents are reliable indicators of academic performance ($\alpha \geq 0.79$) and that the academic performance can be successfully measured by the antecedents. In addition, the model seeks to determine if any significant correlations exist between the academic performance antecedents. The measurement of academic performance is of value to business school directors, managers and investors in private higher education. Researchers and scholars who intend to explore this avenue of academic performance models further could also benefit from this article.

Key phrases

Academic performance; measurement; model and private higher education

JEL Classification: M10; I25

1. INTRODUCTION

Globalisation, the fourth industrial revolution, the high demand for higher education, increasing competition and the collapse of geographic boundaries, amongst other factors, have forced both private and public institutions of higher education into a highly competitive business environment where efficiency and performance are essential for survival (AbuMezied 2016:Internet; Xing & Marwala 2017:Internet). Specifically, the business models of private higher education are here under scrutiny as investors expect a fair return on their investment compared to other investment opportunities. In this regard, Jegede (2016:Internet) points out that the return on investment in African higher education institutions is lucrative and that, on average, investment opportunity yields an average return of 21%; this is at present one of the highest rates of return in the world in education. Measuring the performance of resources, machinery, faculty and investment is, therefore, imperative to determine if a private higher institution (PHEI) performs amicably (Bashir 2017:82-83).

Traditionally, public colleges, technical colleges (Technikons) and universities dominated higher education in South Africa. Resultantly, performance measurement revolved strongly around state requirements and activities, such as publishing research articles in subsidy earning journals, to earn additional subsidy income. The situation for privately owned institutions is that they find themselves in a competitive business environment where financial performance is critical. Competition for an education also exists from the social development objectives of the government who has implemented a free higher education system from December 2017 to all new first year students from families that earn less than R350 000 per year (Muller 2018:Internet). In this system, the poor and working-class students (South African households with a combined annual income of up to R350,000) who are currently enrolled in TVET colleges or university students, are subsidised.

This investment in higher education is expected to contribute to greater economic growth, social justice, reduce poverty, reduce inequality, enhance earnings and increase the competitiveness of the South African economy (Bekezela 2018:Internet). The South African

government's ambition is to increase student enrolments in higher education, in both public and private institutions. This increase in student numbers in public institutions will place a further strain on government resources. The figure indicated by government is1,62 million and it was, 950,000 in 2010 (South African Government 2012:Internet). In 2016 there were 938,201 student enrolments in public higher education alone (SANews 2017:Internet); 309,788 were already funded by the National Student Financial Aid Scheme (NSFAS) while the scheme expects to add more than 100,000 students in 2018 (Nxasana 2017:Internet). In this regard, PricewaterhouseCoopers (2017:Internet) points out that South Africa needs to accommodate 1.5 million higher education students by 2030. In this regard, Badat (2016:72-74), as well as Maharaj (2016:55-66), further highlight that South African higher education has various challenges which include inadequate funding for students' fees, insufficient resources for academic development and student support, skills shortage of adequately qualified academics with doctoral qualifications as well as funding for infrastructure and creating efficiency within public higher education institutions (Havergal 2015:Internet). This is the context within which private higher education institutions function.

In this context, an opportunity exists. Due to the financial constraints that South Africa and many other sub-Saharan Africa countries face, public institutions and system just cannot cope with the growth in enrolments (Garwe 2016:238), and a business opportunity for private higher education realised. This has led to the growth of the private higher education institutions who are responding to the increased demand for education in South Africa (Ilie & Rose 2016:436). Private investors and entrepreneurs responded and entered the tertiary market for education.

Becker, Cummins, Davis, Freeman, Hall and Ananthanarayanan (2017:45-46), in this regard, postulated some entrepreneurial and investor issues regarding entering into a PHEI as an investment opportunity because of the difficulty to determine institutional business performance measurement. These include issues such as: What is on the five-year horizon for higher education institutions? What are the trends and technology developments that will drive educational change? What are the challenges that we consider as solvable or difficult to overcome, and how can one strategise effective solutions? These questions would, according to these researchers, provide direction and focus on the business strategy and performance measures required to achieve the desired outcome. Despite these issues, measuring the performance of a PHEI is more complex. Here the government, quality standards, stringent regulations and legal requirements serve as examples of complexing factors to measure the performance of PHEIs (Department of Higher Education and Training

(DHET 2018:Internet)). Given this background, this study aims to identify antecedents and its respective measuring criteria to measure the academic performance of a PHEI in South Africa.

2. PROBLEM STATEMENT

The business environment of PHEIs, driven by many technological and social forces, is undergoing large-scale and fundamental changes. Businesses function in a complex environment and are required to react effectively and efficiently, be flexible, innovative and respond speedily to the continuous and at times unpredictable changes (Hitt, Ireland & Hoskisson 2017:7). These businesses transform resources into products and services, aiming to do so at a profit while remaining competitive and sustainable in the long-run (Erasmus, Strydom & Rudansky-Kloppers 2016:3). Sustainability requires academic performance measurement. In this regard, Kurniawan and Christiananta (2018:11) assert that academic performance needs to be measured to determine whether improvements and resources deployed have had a positive effect on the business. In practice, the term to measure means to set realistic objectives and then to devise a method to perform an accurate measurement. In practice, the measurement of academic performance is complex and includes various factors to consider.

In addition, measurement models differ according to the type of business and the business environment. Although many models do exist to measure performance variables in higher education institutions, most of these models were developed for public institutions. Performance criteria in public institutions, however, differ from that of private higher education institutions aiming to realise profits and present attractive investment opportunities. Public institutions typically receive; in addition to class fees, also subsidies on approved student numbers stratified per degree they study (Strydom 2019). They also earn subsidies from research publications and can apply for government grants to expand teaching facilities (Higher Education South Africa (HESA) 2011). The DHET (2004:2) indicates that a broad category in the flow of funds to public institutions are government grants (50%), Student tuition (25%) and other private income, such as training courses and contract research projects, amount to 25%. Private institutions' income originates primarily class fees while they compete with public institutions for training and research contracts (Asvat 2018:6). It is also noteworthy that PHEIs are operating in a harsh regulatory environment set by the Department of Higher Education and Training where new educational programmes are regulated by the Higher Education Act (No. 101 of 1997) (SA 1997). PHEI, therefore, cannot launch new programmes without approval, while the application process to

do so, is slow. This results in a slow time-to-market environment where it is not possible to quickly act on market needs. Resultantly, although a PHEI as an organisation shares mutual attributes with other private enterprises, they possess unique attributes in its operating and business environment. PHEI's are, therefore, not typical private business enterprises, and as a result private performance models cannot just be applied 'as is' to measure performance of PHEIs. They require an adapted performance measurement model.

Although there are a growing number of private education institutions, research that focussed specifically on the performance measurement of South African PHEIs, is still limited (Asvat 2018:2). This article then aims to develop a model to measure the academic performance of a private higher education institution in South Africa.

3. RESEARCH OBJECTIVES

The primary objective is to validate a model to measure the academic performance of private higher education institutions in South Africa.

The following secondary objectives serve the primary objective:

- Theoretically underpin academic performance antecedents;
- Validate the antecedents of academic performance and its respective measuring criteria statistically;
- Construct a visual model to measure academic performance.

4. ACADEMIC PERFORMANCE

4.1 Defining academic performance

Many researchers and business analysts have tried to define academic performance. Most definitions include institutional objectives and also criteria to measure academic performance as a construct. Some also include the intelligence generated by the academic performance measurement process. The concept also seems to have been well researched as the core of definitions changed little over the past decade. Some academic performance definitions are:

- 'The capability to measure the level of performance of any organization' (Olusola 2011:Internet).
- 'Academic performance measures are a set of quantifiable metrics taken from various sources that together with an appropriate analytical process, allows the management of a business to track and assess the current status of a specific business, project or process' (Baskerville 2015:Internet).
- 'Businesses measure what they manage and academic performance aims to achieve

this. This is a complex activity and requires focus and clear objectives and goals to be measured' (Van Looy & Shafagatova 2016:1797).

- 'Business performance management entails reviewing the overall academic performance and determining how the business can better reach its goals' (Business Directory 2017:Internet).

Academic performance, after consideration of the above and also other definitions, imply specifically formulated outcomes, a component of measurement of these outcomes that an organisation achieves during one particular period, and the application of the intelligence generated from the measurement. Therefore, to measure academic performance, it is necessary to establish whether the outcomes desired have been met. In practice, this means that the desired outcomes need to be identified clearly, and then to develop efficient measuring criteria (other than mere accounting norms) to effectively measure how well (or not) the organisation achieved these outcomes.

4.2 Measuring academic performance

Measuring academic performance requires a multidimensional approach because businesses are impacted by various factors. These could be micro, market or macro environmental factors (Kurniawan & Christiananta 2018:9-11). Venusita and Dyani (2018:4) further state that modern academic performance is strongly influenced by the external business environment where factors such as globalisation, disruptive technological changes, the free flow of goods, services and information and instant communication abilities are prevalent; these are all aspects that influences the organisation to reach its desired outcomes. Academic performance measurement also incorporates financial objectives such as value creation for the shareholders or stakeholders of the business. In this regard, Primadonna and Emrizal (2018:1121) state that modern businesses' performance cannot be measured only from a financial perspective. Financial information is a basis for only one of many performance outcomes a current business should achieve. Back in 2002, Hussain and Hoque (2002:167) strongly argued the consideration of non-financial performance measurements that could improve academic performance. Today many business analysists and researchers (Butler 2017; Hecht 2018; Kaplan Knowledge Bank 2018; VisionEdge 2018; Yulliansyah & Razimi 2015) support Hussain and Hoque (2002) by stating that performance measures such as reputation, innovation, customer value, competitiveness, the balanced scorecard and customer indices are key performance measurement antecedents. In addition, these analysists also add that constant communication and enabling technology abilities, specifically in the education business environment (Learning Portal 2018:Internet),

play an important role in the performance of these institutions by maintaining customer loyalty, forming relationships with customers and to develop trust with your customers as part of the academic performance measurement exercise.

Measuring academic performance is central in any organisation regardless of whether the organisation is a public enterprise or if it is privately owned. All organisations are challenged to operate productively and to achieve its planned outcomes as effectively and efficiently as possible (Van Looy & Shafagatova 2016:1799). In this quest, using an appropriate academic performance model that contains the appropriate performance indicators is vital to measure the academic performance of the organisation against the planned outcomes. Noteworthy is that both the planned outcomes and academic performance measurement model should be aligned to an organisation-specific developed business strategy (Sandeep & Bedi 2016:603; Silvestro 2014:276). This strategy and the expected outcomes should be efficiently communicated throughout the organisation so that all the personnel in the organisation know what the performance expectations are, how it will be monitored, what feedback is needed, when feedback is expected and also so that managers can motivate employees to achieve these desired results (Sandeep & Bedi 2016:607; Teeratansirikool, Siengthai, Badir & Charoenngam 2013:180). Measuring academic performance is not an end by itself but rather a mechanism or tool for review of strategy and effective use of the resources of the organisation to guide management towards achieving higher performance levels (Sandeep & Bedi 2016:605).

4.3 Academic performance measures and strategic management planning

Academic performance is an integral part of the strategic plan, while academic performance measures are dependent on the organisation's capability to meet the planned outcomes. These outcomes are industry-specific and also differ between organisations within the same industry. Same-industry differences exist because of possible different business models, competitive forces, market focus, ownership structure, ownership expectations, the current business life-cycle stage and other differences between organisations (Geldenhuys 2018:Internet). It is because of these differences that academic performance indicators vary across various dimensions to fit the needs of the specific industry and also the specific organisation. This includes the financial indicators, the non-financial performance indicators and the influence of social capital on academic performance (Primadona & Emrizal 2018:122); all three these performance indicators should be considered when designing organisational academic performance measures. Strategic planning mobilises the

capabilities of the organisation to reach the desired outcomes. Satisfactory academic performance should be one of the strategic thrusts, and measuring academic performance should be integrated into the strategic plan of the organisation (David & David 2017:33).

Ultimately, in a private organisation, financial performance trumps other measures when it comes to shareholder wealth and future investments. This is because shareholders invest capital and resources that are required for production and delivery of the products or services offered to the market so that the organisation can meet the desired outcomes by making a profit (Hill, Jones & Schilling 2017:4-5). It is important to note that although a business has to be profitable to survive in the long-run, profitability can also be improved by other nonfinancial measurement antecedents (Butler 2017:Internet; VisionEdge 2018:Internet). It is also important to note that each business model and its planned business strategy is unique. Therefore, developing academic performance measures should adapt to incorporate the uniqueness of the specific business and the industry (Geldenhuys 2018:Internet). There cannot be a one size fits all approach when determining academic performance measures for any business today (Hill *et al*. 2017:8).

4.4 Advantages of measuring academic performance

The fast-changing business environment and globalisation require fast reaction and adaptation of business strategies. Traditional 5-year strategic plans have been redesigned into typically 3-year rolling plans and annual scenario planning (Venter 2017:2). In this regard, businesses attempt to understand the factors that affect performance, to measure the performance of these factors, and to take the necessary action to enhance them, so that they can improve their performance (Gomes & Romão 2014:Internet). In this case, they improve their competitiveness and react to the changes in the business environmental forces before their competition can (Ogunsiji & Ladanu 2017:77). This leads to the competitive advantage of rapid changes in business strategy. Other advantages of performance measurement are:

- Dynamic financial measures, rather than annual financial statements that reflect
- historically on the past accounting period, can be used by management to adjust their strategic focus (Hill *et al*. 2017:7).
- Enhanced predictions about the long-term financial performance (Aker 2017:Internet).
- Performance standards are communicated and well-known throughout the organisation (Charboneau 2017:Internet).
- Linking strategic planning to execution by acting on dynamic performance

measurement information (Schiff 2005:Internet).

- Achievement of the long-term organisational goals (Aker 2017:Internet).
- Higher profitability as a result of using non-financial metrics that influence the performance of the organisation (Singh, Darwish & Potočnik 2016:214).
- The organisation can determine how well it performs overall (not only financially) (Singh *et al*. 2016:217).
- Acting on real-time data and making better managerial decisions (Schiff 2005:Internet).
- Rapid changes in business strategies (Ogunsiji & Ladanu 2017:75; Venter 2017:4).
- Higher levels of customer loyalty (Aker 2017:Internet).
- Developing agility and adaptability within organisational structures to adapt to changing global trends, yet focused on meeting the objectives of the organisation (Hitt *et al*. 2017:404).
- Cost saving and increased profits (Schiff 2005:Internet).

Aker (2017:Internet), however warns that although the advantages of academic performance measurement far exceeds the disadvantages, there are also some disadvantages. They are:

- Short-term results orientation may result because short-term performance (to meet the performance measurement requirement) becomes more valuable than the factors that cause them.
- Employees may become too focused on the business outcomes, lose sight of their customers' needs and allow service or satisfaction to decline.
- Standardisation may result as employees start to modify their work habits to align with the performance measure applied. This could lead to a decline in employee creativity.
- A loss of innovation because in adhering to the applied performance measure, employees could be discouraged to experiment with innovative solutions that might produce a better result.

5. RESEARCH METHODOLOGY

5.1 Literature base

This study employed a literature and empirical review. The literature study encompasses the topic of academic performance and how to measure it. Relevant business performance antecedents and their respective measuring criteria that are important to PHEIs as identified by Asvat, Bisschoff and Botha (2018:62) were used to collect the data. The methodology to

validate and modelise the antecedents and its criteria were recently used by Shaikh, Bisschoff and Botha (2017:138). These authors based their methodology on the success of various previous studies (Asvat 2018; Bester & Bisschoff 2018; Imandin 2015; Naidoo 2012) that also validated and modelised antecedents and measuring criteria to measure a variety of managerial dependent variables such as brand loyalty, stress management, employee retention and management skills. Using this methodology, Imandin, Bisschoff and Botha (2016:100) formalised seven steps to construct a model to measure employee engagement successfully. This study adopted and followed these steps as a guideline to develop the model to measure academic performance of PHEIs. This model is then operationalised and applied to measure the academic performance of a PHEI. A total of 24 potential antecedents were identified from the literature. These antecedents were then subjected to literature scrutiny to ensure their relevance to measure academic performance (Moolla 2010). The antecedents listed by various literature sources and those used in similar studies and models to measure academic performance were retained (Asvat 2018). Six antecedents were omitted from the initial list. The measuring criteria for the remaining 18 antecedents were then developed from the literature and compiled in a questionnaire. These antecedents, their description and literature origins, are outlined in Table 1.

Table 1: Antecedents considered and their origin

Number	Antecedent	Measuring Criteria
1	Economic factors	• Inequality • Disadvantaged • Quality of life • Social divisions
2	Selectivity, expenditure and retention	• Access • Support • Cost of programmes • Selection criteria • Graduation rates
3	Parent income level, attitudes and expectations	• Parent involvement • Family structure • Culture • Ethnic goals
4	Motivation	• Personality • Behaviour • Determination • Beliefs • Competence

Number	Antecedent	Measuring Criteria
5	Workload	• Capacity • Change • Integration • Energy
6	External forces	• Parental involvement • Ethnic minority
7	Self-efficacy	• Choices • Assurance • Experience • Challenges
8	Help-seeking	• Faculty interactions • Values • Staff • Peers
9	Attendance	• Lectures • Contact • Availability • Teaching and learning • Communication
10	Affective factors	• Attitude • Self-esteem
11	Self-concept	• Ideas • Attitude
12	Self-esteem	• Transition • Stress • Task completion
13	Stress	• Resources • Attention • Experience
14	Active learning	• Engagement • Achievement • Effort
15	Extracurricular activities	• Involvement • Performance • Age • Grades
16	Adjustment	• Psychosocial factors • Background • Outcomes

Number	Antecedent	Measuring Criteria
17	Class size	• Attentiveness • Participation • Classmates
18	General academic measures	All issues worthy of investigation but not relevant to a specific antecedent

Source: Rehman, Bisschoff and Botha (2019)

5.2 Quantitative data collection

The questionnaire contained two sections: Section A: Demographics and Section B: Measuring criteria. Section A consists of five questions to compile the demographic profile of the respondents. Section B consists of the final 18 antecedents dealing with academic performance constructs, each with its unique measuring criteria. The criteria were formulated in statement format to which the respondents had to indicate their level of agreement or disagreement on a five-point Likert scale. In total, Section B consisted of 86 measuring criteria.

The population consisted of all full-time academic and academic support employees at two private business schools. These schools were selected because they dominate the South African market share in private business schools, have a wide geographic service area which covers South-Africa and also Southern Africa, and the top management of both schools support the research project actively. The total population was targeted; no sample was drawn. The employees were requested to complete the questionnaires. It was clearly communicated that participation is voluntary and also anonymous. The researcher forwarded the questionnaires to trained office managers in the outlying offices and to the academic managers at the head office in Durban to assist with the distribution and collection of the questionnaire. A total of 250 questionnaires were distributed of which 247 were completed and returned, signifying an effective response rate of 98.8%. The data was captured by the Statistical Consultation Services of the North-West University and analysed with the IBM Social Package for Social Services Version 25 (IBM SPSS 2018).

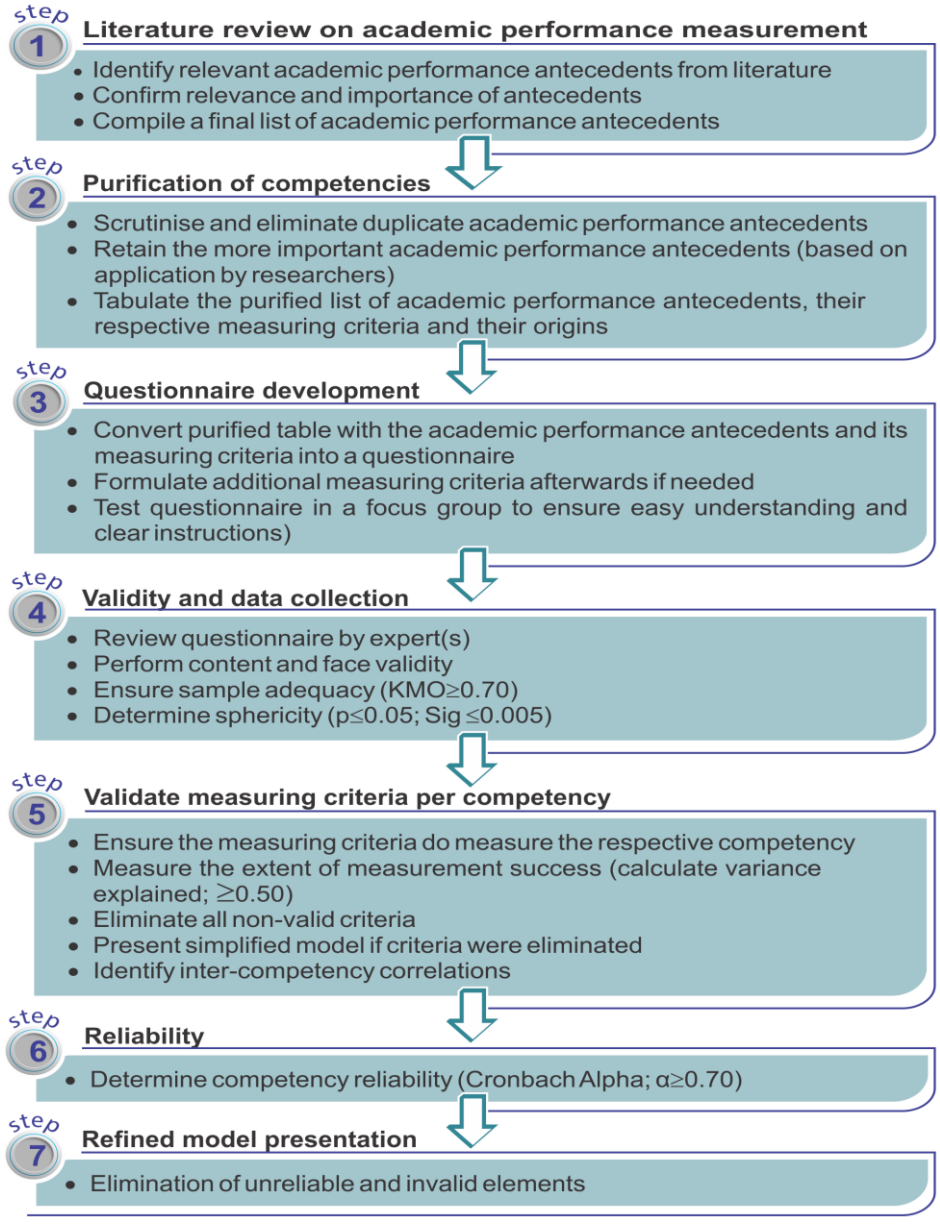
5.3 Ethical clearance

The study was subjected for ethical clearance to the Ethics Committee of the Faculty of Economic and Management Sciences at the North-West University and classified as a low-risk study. The North West University Business School then issued a formal ethical number (No. EMS17/04/15-01/2).

5.4 The methodology used to develop and validate the model

The methodology developed by Imandin *et al*. (2016:101-104) to develop and validate measuring models underpins this article. This seven-step process (see Figure 1) was successfully applied by other researchers such as Shaikh (2017) and also Asvat (2018) in their quest to develop models to measure leadership competencies and to measure academic performance in the private higher education environment.

Figure 1: Methodology to develop and validate a model to measure academic performance



Source: Adapted from Asvat 2018:50

6. RESULTS

In the first two steps, a total of 18 antecedents were identified from the literature. Some 86 relevant measuring criteria about each antecedent were also identified from the literature. In Step 3 the questionnaire realised to collect the data using a 5-point Likert scale. Steps 4, 5, 6 and 7 require statistical confirmation from the empirical study. In these steps, the measuring criteria of the antecedents, the adequacy of the sample, variance explained and reliability are calculated. The measuring criteria of each antecedent are subjected to exploratory factor analysis to determine if the antecedent is indeed measured by these criteria. Ideally, all the criteria should load onto the antecedent identified from the literature; this signifies validity and also that the antecedent is a pure construct and does not have embedded sub-constructs. This means that the relevant criteria measure one construct only (Field 2009:786). Numerous researchers (Asvat 2018, Bisschoff & Moolla 2014, Fields & Bisschoff 2013a & 2013b; Shaikh 2017) successfully validated their models' antecedents likewise.

Where two factors are extracted, it means that the antecedent actually consists of two sub-antecedents and as such, the antecedent is measuring not one, but two or more academic performance constructs. Bisschoff and Moolla (2014:1117) found one such case where the antecedent 'value for money' was actually a dual measure consisting of the two sub-antecedents' 'quality' and 'price'. A low loading criterion (with a factor loading ≤0.40) also indicates its lesser importance in the measuring of the antecedent (Field 2009:631). Hence the criteria with low loadings were omitted from further analysis. The sample adequacy, sphericity and reliability are shown in Table 2. Then Table 3 shows the results obtained from the exploratory factor analysis per antecedent. The criteria and its factor loadings are also shown in Table 2.

Table 2: Academic performance antecedents' suitability statistics

Antecedents	Sample adequacy (KMO)	Sphericity (Bartlett)	Reliability (α)	Variance explained ($\sigma^{2)}$
Economic factors	0.78	0.00	0.79	62.71%
Selectivity, expenditure and retention	0.83	0.00	0.84	61.82%
Parent income level, attitudes and expectations	0.77	0.00	0.86	69.82%
Motivation	0.88	0.00	0.92	76.14%
Workload	0.83	0.00	0.92	80.92%

Antecedents	Sample adequacy (KMO)	Sphericity (Bartlett)	Reliability (α)	Variance explained ($\sigma^{2)}$
External forces	0.80	0.00	0.87	72.26%
Self-efficacy	0.85	0.00	0.92	80.31%
Help seeking	0.83	0.00	0.86	73.23%
Attendance	0.83	0.00	0.90	77.50%
Affective factors	0.79	0.00	0.88	74.21%
Self-concept	0.78	0.00	0.90	77.33%
Self-esteem	0.83	0.00	0.93	77.35%
Stress	0.79	0.00	0.88	73.17%
Active learning	0.73	0.00	0.88	80.01%
Extracurricular activities	0.57	0.00	0.80	72.07%
Adjustment	0.82	0.00	0.89	75.02%
Class size	0.81	0.00	0.92	80.61%
General	0.93	0.00	0.93	61.29%

Source: Compiled from the survey results

Table 2 above should be read in conjunction with Table 3 below. Table 2 showed the results on evaluating the reliability of the antecedents and ensuring that the data is suitable for use in validating a model. Table 3 below shows the details on the measuring criteria and their validity towards the antecedents.

Table 3: Factor analysis on individual academic performance antecedents

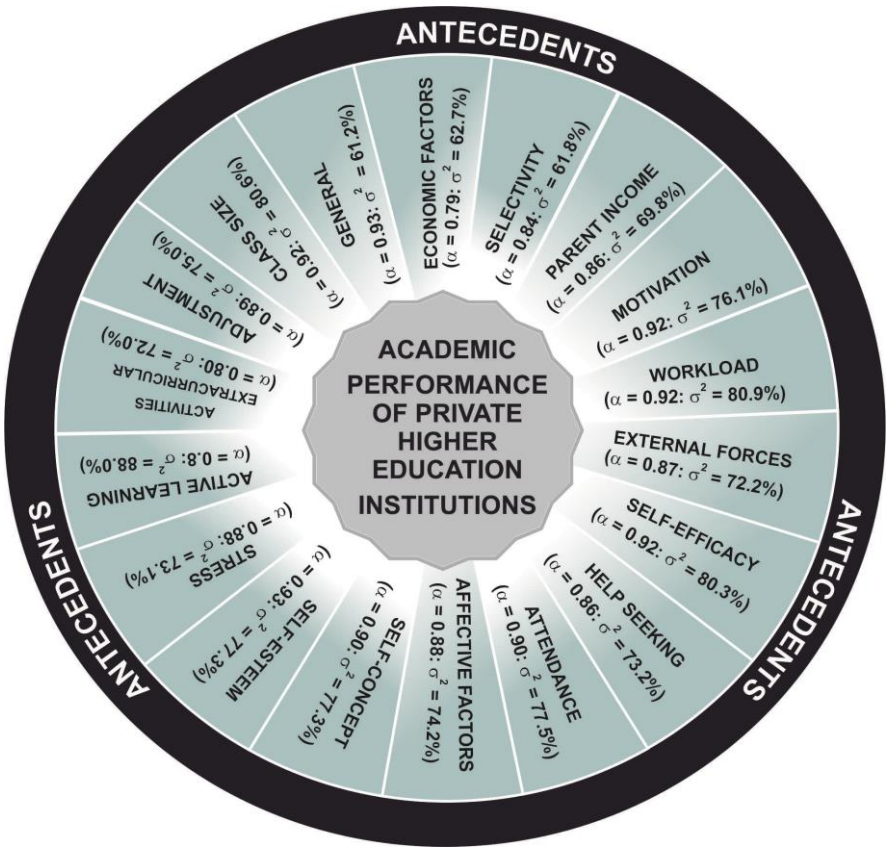
Economic factors	Factor loadings	Selectivity, expenditure & retention	Factor loadings	Parent income level, attitudes & expectations	Factor loadings	Motivation	Factor loadings
b1n3	0.841	b2n4	0.875	b3n3	0.897	b4n3	0.918
b1n4	0.794	b2n3	0.802	b3n2	0.861	b4n4	0.881
b1n5	0.781	b2n2	0.796	b3n4	0.814	b4n5	0.866
b1n1	0.75	b2n1	0.756	b3n1	0.777	b4n2	0.849
		b2n5	0.693			b4n1	0.847

Workload	Factor loadings	External forces	Factor loadings	Self-efficacy	Factor loadings	Help seeking	Factor loadings
b5n3	0.921	b6n3	0.872	b7n2	0.92	b8n2	0.889
b5n4	0.911	b6n4	0.868	b7n3	0.907	b8n3	0.883
b5n2	0.889	b6n1	0.841	b7n4	0.884	b8n1	0.875
b5n1	0.876	b6n2	0.815	b7n1	0.871	b8n4	0.771
Attendance	**Factor loadings**	**Affective factors**	**Factor loadings**	**Self-concept**	**Factor loadings**	**Affective factors**	**Factor loadings**
b9n3	0.908	b10n2	0.892	b11n2	0.895	b10n2	0.892
b9n2	0.899	b10n1	0.868	b11n4	0.888	b10n1	0.868
b9n4	0.884	b10n4	0.862	b11n1	0.885	b10n4	0.862
b9n1	0.827	b10n3	0.82	b11n3	0.85	b10n3	0.82
Self-concept	**Factor loadings**	**Self-esteem**	**Factor loadings**	**Stress**	**Factor loadings**	**Active learning**	**Factor loadings**
b11n2	0.895	b12n3	0.905	b13n2	0.917	b14n4	0.919
b11n4	0.888	b12n2	0.898	b13n1	0.853	b14n2	0.897
b11n1	0.885	b12n4	0.895	b13n3	0.834	b14n1	0.867
b11n3	0.85	b12n5	0.874	b13n4	0.814		
		b12n1	0.82				
General	**Factor loading**	**Adjustment**	**Factor loading**	**Class size**	**Factor loading**	**Extra-curricular activities**	**Factor loading**
b18n10	0.843	b16n3	0.922	b17n2	0.919	b15n2	0.948
b18n9	0.817	b16n2	0.906	b17n1	0.896	b15n1	0.932
b18n3	0.806	b16n1	0.837	b17n3	0.891	b15n3	0.627
b18n7	0.794	b16n4	0.793	b17n4	0.884		
b18n1	0.787						
b18n8	0.783						
General	**Factor loading**	**Adjustment**	**Factor loading**	**Class size**	**Factor loading**	**Extra-curricular activities**	**Factor loading**
b18n4	0.766						
b18n6	0.756						
b18n11	0.751						
b18n2	0.714						

Source: Compiled from the survey results

A total of 18 antecedents were evaluated and the results appear in the table above. All of the antecedents are statistically satisfactory; they all exceed the required 60% variance explained, have satisfactory (α≥0.70) to excellent reliability (α≥0.80), have low sphericity (≤0.05) and all but one antecedent (Extracurricular activities) show that an adequate sample was used to validate the antecedents (Field 2009:658). In fact, most of the antecedents explain high variances. This means that the measuring criteria effectively measure the specific antecedents well and that the antecedents have high validity embedded because a limited percentage of variance is left unmeasured. This is substantiated by the high factor loadings of the measuring criteria, which show strong relationships with the specific antecedent. No dual-loading or low-loading measuring criteria were present in the analysis (see also Table 3) hence there was no need to eliminate these criteria from the model (Imandin *et al*. 2016:99). Also noteworthy is that none of the antecedents consisted of two or more sub-factors. This means that the measuring criteria do measure the specific antecedent and not only some components thereof. See Figure 2 for the model to measure the academic performance of PHEIs.

Figure 2: A model to measure the academic performance of PHEIs



Source: Compiled from the survey results

From the results in Table 2 and the model in Figure 2 it is then concluded that antecedents and their criteria postulate a valid and reliable model and that the criteria identified do measure what it is supposed to measure (in this case the respective antecedents) (Asvat *et al*. 2018:60; Shaikh *et al*. 2017:135). It is also concluded that the measuring criteria and their respective antecedents can be applied in practice to measure the academic performance of a private higher education institution.

7. CONCLUSIONS

This article used a tried and tested scientifically-researched process that proved to be successful in some other social science studies to construct a model to measure academic performance. The study, firstly, identified the relevant antecedents of academic performance in higher education, and the, secondly, developed relevant measuring criteria (83 in total) for each antecedent. Thirdly, the validity of the measuring criteria was empirically established, and finally, the reliability of each antecedent was calculated. From the development of the empirical model, it can thus be concluded that:

- The process followed to identify the 18 academic performance antecedents and then to develop the respective measuring criteria once again proves to be scientifically sound.
- Using exploratory factor analysis to determine if all measuring criteria actually contribute towards calculating each antecedent, respectively, the analysis continued and scrutinised the sample adequacy, variance explained and reliability of each antecedent. Based on these results, the sample is adequate, the antecedents of the model are reliable and the sphericity between the variables is satisfactory.
- Based on the first two conclusions, it is also concluded that the model to measurement of academic performance for a private higher education institution in South Africa is valid.

8. MANAGERIAL IMPLICATIONS

This study presents a usable validated model to measure the academic performance antecedents of private higher education institutions in South Africa. Resultantly, the managerial implications are that managers can:

- apply the model to measure the academic performance of a private education institution;
- partially use the model and measure the performance of specific antecedents;

- determine which antecedents are performing well and which ones are not performing well in the strive to improve the academic performance of their students;
- initiate managerial interventions to improve specific antecedents;
- determine the success of managerial interventions in specific antecedents; and
- determine if the academic performance improved or declined over a specific period of time.

Further, this model is relevant to managers, directors, potential investors and owners of private higher education institutions to assess the academic performance of a private higher education institution in South Africa.

9. LIMITATIONS OF THE STUDY

The following limitations pertain to the study because the data were collected from two major private sector business schools in South Africa. This means that:

- Firstly, care should be taken when extrapolating the study to a wider audience outside South Africa. The regulatory constraints imposed by the Council for Higher Education is only relevant to South African private education institutions, hence private institutions governed by other councils of higher education may operate under a different regulatory environment.
- Secondly, the business of managing a business school may differ from that of other private higher education institutions that provide education in, for example, information technology, technical training or natural sciences. In measuring academic performance in these (and other) educational scenarios, care should be taken to add the uniqueness of the specific fields of study to the measuring model.

10. SUMMARY

This study focused on the development of a model to measure academic performance. The point of departure in the development of the model was to identify the relevant antecedents that pertain to the academic performance of a private higher education institution in South Africa. This was followed to identify measuring criteria for each of these antecedents. Both the antecedents and their respective measuring criteria were identified from existing models and other literature sources. Next, the identified measuring criteria required statistical proof that they are valid before they could be included in the model. The empirical results showed that 18 antecedents exist and that they are measured by a total of 88 valid measuring criteria. The

model also succeeded to rank the antecedents in order of importance to assist managers to gain most benefit from their managerial interventions.

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