THE VALIDATION OF A POTENTIAL ASSESSMENT BATTERY FOR ENGINEERING TECHNOLOGY STUDENTS

by

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Dedicated to my parents Maarten and Alta Olivier, for relentlessly believing in me and to the loving memory of Mariana Bothma, for teaching me the art of being alive
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Summary

THE VALIDATION OF A POTENTIAL ASSESSMENT BATTERY FOR ENGINEERING TECHNOLOGY STUDENTS

by

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Department: Psychology
Degree: Magister Artium (Psychology)

The selection of students for higher education has been a burning issue on the agenda of South African institutions of higher education for the past decade. Institutions for higher education are experiencing pressure from both their clients and the government to broaden access, but at the same time financial realities force these institutions to admit only those candidates with the potential to be successful in their chosen course of study.

The main aim of this study was the identification of variables which relate to academic success amongst Engineering Technology students at Technikon Pretoria, and to incorporate them into a selection battery which would be both valid and reliable.

A non-experimental, correlational design was selected, as this research technique is considered the best controlled and most accurate of all non-experimental designs. Since a quantitative technique was selected for data gathering, the necessity for a statistical method in the data analysing process was obvious.

The sample for this study consisted of a total of 732 Engineering Technology
students at Technikon Pretoria. From these, 512 were Civil Engineering Technology students and the remaining 220 were Mechanical Engineering Technology students. These subjects were the total number of students from these two academic departments, enrolled from 1997 to 1999, of whom both psychometric and academic data were available. The sample consisted of 14.75% female and 85.25% male respondents and was representative of the cultural diversity of the Technikon campus.

The competencies indicated by academic staff involved with the training of Engineering Technology students at Technikon Pretoria were hypothesised to be indicative of a potentially successful student. After the identification of these predictor variables the assessment battery to be used in this study was compiled. This was then included in a comprehensive set of data regarding each applicant, together with the required school performance. A forward stepwise multiple regression analysis was performed on the data in order to establish the predictive validity of the assessment battery.

The expansion of the traditional selection procedure to include the potential assessment phase proved valuable, as the validity of all prediction models improved with the addition of the indices from the Potential Index Batteries. The prediction models were found to be unbiased against students from the previously disadvantaged school systems and can thus be said to be culturally fair.

Key terms: Selection; assessment; assessment battery; potential; ability; competency; validity; reliability; regression model.
OPSOMMING

DIE VALIDERING VAN ‘N POTENSIAALBEPALINGSBATTERY VIR INGENIEURSTEGNOLOGIESTUDENTE
deur
Helena Kriel

Studieleier: Prof RP de la Rey
Departement: Sielkunde
Graad: Magister Artium (Sielkunde)

Die keuring van studente is vir die afgelope dekade ‘n belangrike punt op die agenda van hoëronderwysinstellings in Suid-Afrika. Hoëronderwysinstansies ondervind druk van beide hul kliënte en die regering van die dag om toelating tot die instansies te verhoog, maar terselfdertyd nook finansiële realiteite hierdie instansies om slegs studente toe te laat wat oor die potensiaal beskik om suksesvol in die kursus van hul keuse te wees.

Die hoofdoel van hierdie ondersoek was om die veranderlikes wat met die akademiese sukses van Ingenieurstegnologiestudente verband hou, te identifiseer en in ‘n geldige en betroubare keuringsprogram op te neem.

Daar is gebruik gemaak van ‘n nie-eksperimentele, korrelatiewe ontwerp, aangesien hierdie ontwerp beskou word as die mees akkurate van alle nie-eksperimentele ontwerpe. Daar ‘n kwantitatiewe tegniek vir data-insamaling verkies is, was die belangrikheid van ‘n statistiese tegniek vir die verwerking van die data voor die hand liggend.

Die steekproef vir die studie het bestaan uit 732 Ingenieurstegnologiestudente aan Technikon Pretoria. Hiervan was 512 Siviele Ingenieurstegnologiestudente en die
oorblywende 220 Meganiese Ingenieurstechnologiestudente. Hierdie proefpersone was die totale groep studente uit hierdie twee departemente, geregistreer vir die tydperk 1997 tot 1999, vir wie daar beide psigometriese data en akademiese resultate beskikbaar was. Die steekproef het bestaan uit 14.75% vroulike en 85.25% manlike respondente en was verteenwoordigend van die kulturele diversiteit van die Technikonkampus.

Die bevoegdheid wat deur akademiese personeel betrokke by die opleiding van Ingenieurstechnologiestudente aangedui is, is hipoteties gestel as aanduidend van 'n potensieel suksesvolle student. Nadat hierdie voorpellingsveranderlikes geïdentificeer is, is die evalueringstool gebruik in hierdie studie saamgestel. Die psigometriese data is ingesluit in 'n omvattende databasis ten opsigte van elke kandidaat, tesaam met die vereiste skoolprestasie. 'n Voorwaardse stapsgewyse regressie-ontleding is op die data uitgevoer ten einde die voorspellingsgeldigheid van die potensiaalbepalingsstool te stel.

Die uitbreiding van die tradisionele keuringsprosedure deur die insluiting van die potensiaalbepalingsfase het waardevol geblyk te wees, aangesien die geldigheid van alle voorspellingsmodelle verhoog het met die insluiting van die indekse van die Potential Index Batteries. Die voorspellingsmodelle is bewys syndig te wees ten opsigte van studente uit voorheen benadeelde skoolstelsels nie en kan daarom as kultuurbillik beskou word.

Sleuteltermes: Keuring; evaluering; evalueringstool; potensiaal; vermoë; bevoegdheid; geldigheid; betroubaarheid; regressiemeet.
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**SOLE DEO GLORIA !**