

(IN)EQUITY OF EXCEPTIONAL ACADEMIC ACHIEVEMENT IN SOUTH AFRICAN HIGHER EDUCATION

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ABSTRACT

The phenomenon of exceptional academic achievement in South African higher education is under-researched and frequently overshadowed by concerns around failure, underachievement, and poor quality of throughput. This article reports on a study of exceptional academic achievement at a South African university. Taking a selection of contextually relevant and available variables, a logistic regression methodology was applied to a sample of graduates from



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the University of KwaZulu-Natal (UKZN) – an internationally ranked, recently merged and rapidly transforming South African university. As an outcome of this application, a model of the socio-demographic and educational variables associated with exceptional academic achievement in undergraduate students was developed. The model suggests that variations in 'race', gender, financial aid allocation, matriculation score and matriculation English symbol are significantly associated with increased odds of exceptional academic achievement. Interaction terms for 'race' and gender were also entered in the model. The study also found that when compared with all other groups, white females were most likely to excel academically. The results from the study provide a basis for connecting discourses pertaining to excellence, exceptional academic achievement, and quality of throughput at an undergraduate level with those of equity and equality in South African higher education. It highlights that although some advances in the equity of academic achievement for different 'race' and social groups at the UKZN have been made, there is considerable room for improvement in the domain of exceptional academic achievement.

Keywords: exceptional academic achievement, undergraduate higher education, logistic regression methodology

INTRODUCTION

Improvement in the quality and equity of student academic achievement is a key priority for South African higher education, this being evident in the *White Paper for Post-school Education and Training* (DHET 2013, 27) and the *National Development Plan NPC 2012*, 50. Both of these papers position South Africa's socio-economic development in direct relation to the production of a diverse and high-quality graduate workforce, and propose plans to increase the quantity, quality and equity of student participation and academic performance within universities. Although quality is likely to include indicators across both academic and non-academic achievement domains, the study reported on in this article was focused on quality in terms of academic achievement at the undergraduate level of study. Specifically, the study attended to the socio-demographic and educational variables associated with those graduates who completed their first undergraduate degrees with academically exceptional results. For the purposes of this study, exceptional academic achievement at the undergraduate level was assumed to refer to those students who graduated from their undergraduate degrees *cum laude* or *summa cum laude*.¹ Although there is also a domain of inquiry that seeks to explain the individual, social and educational processes involved in exceptional academic achievement outcomes, the study reported in this article was primarily interested in isolating the variables associated with exceptional academic achievement in higher education. It is argued that studying and understanding high academic achievement levels are

important for both national and global competitiveness of higher education systems, and for the contribution such students potentially make to knowledge in particular and society in general. The study of exceptional academic achievement also has relevance for improving conditions for success in higher education for all students. In this light, the authors of this article affirm that ‘without serious, sustained attention to the goals of excellence in academic achievement and consequences tied to not reaching these goals, no real improvement is likely to happen in the education of those on the bottom of the achievement gap’ (Rivera 2005, 83).

LITERATURE REVIEW

Although international research that has engaged with issues of academic exceptionalism, excellence, throughput and equity in higher education has a long history (Gardner 1964), there also appears to have been a growing interest in this domain (Ferrari 2002; Bowen, Kurzweil and Tobin 2005; Altbach and Salmi 2011). In contrast, research on academic achievement in South African higher education has not explicitly prioritised exceptional academic achievement as a domain of inquiry. A survey of South African higher education literature over the past ten years does indeed identify a focus on academic achievement (specifically success), however, success seems to be conceptualised as roughly equivalent to the notion of retention and throughput (Ochse 2005; Akoojee and Nkomo 2007; Machika 2012; CHE 2013; Visser and Van Zyl 2013). Related to a focus on success, and retention and throughput, there has been a concurrent focus on the identification of strategies to address academic (under)achievement in South African higher education (that is, improving pass rates) (Wilson-Strydom 2010). Some anecdotal instances of academic exceptionalism in South African higher education have been reported (Scott et al. 2005), however, it appears that an overriding (and understandable) concern has been (and still is) with remediation and development in the realm of academic underachievement. Dass-Brailsford’s (2005) work on the topic of equity and academic achievement generated some discussion around individual, family, school and community factors associated with academic achievement among disadvantaged students. However, this work was constrained by a focus on academic achievement in terms of passing and throughput, and did not include objective instances of exceptional academic achievement.

Contextually relevant variables

A number of educational and socio-demographic variables have been explored in relation to academic achievement and performance in university. The most commonly occurring variables include ‘race’, gender, socio-economic status, and previous educational (that is, school) academic achievement. South Africa’s transition to democracy in the mid-1990s also facilitated processes that would enable equitable

participation in educational (and other) domains of public life. For example, enrolment in higher education increased 71 per cent from 2004 to 2009, with two-thirds of university students being African in 2009 compared with 32 per cent in 1990 (NPC 2012, 317). In strong contrast to the growing equity of access in South African higher education, equitable outcomes (in the form of graduation, throughput and success rates) have not materialised as readily. In 1997, the Department of Education (DoE) noted the need to enhance the ‘success [academic achievement] rates of Black students in general, and of African, Coloured and women students in particular’ (DoE 1997, 2.24). Although increasing numbers of black students have enrolled in South African higher education since the 1990s (DHET 2013, 38), current enrolments are still not representative of the 91 per cent national population estimate for black South Africans (Statistics South Africa 2013, 6). In addition, increased access to higher education has not been accompanied by increased ‘racial’ equity of throughput. Borat, Mayet and Visser’s (2010, 100–101) study of seven South African higher education institutions identified differing graduation to premature exit rates for African, Indian and white students. Specifically, the most favourable odds for graduation rested with white female students (3:1), while the least favourable odds were found for African females (1:2). In other words, for every African female student who graduated, two dropped out, whereas for every white female student who dropped out, three graduated. In specifically considering drop-out from and failure of first year modules at one South African higher education institution, Zewotir, North and Murray (2011, 1239) found that when compared with white students, African students generally had significantly greater odds of failure and drop-out.

Other South African studies of academic achievement in higher education suggest that when compared with male students, female students are significantly more motivated in relation to their academic endeavours (Sikwhari 2007), while white female students academically outperform other students (Gibbon 2010; Ochse 2003; 2005). The trend is similar on an international level. In the United States (US) for example, although certain family and socio-economic factors may enhance female students’ academic achievement, female students have generally begun to outperform male students in higher education (Lundy 2010, 22). Similarly, white and Asian students in the US were found to be more likely to attain a bachelor’s degree when compared to African American, Latina and Native American students (Lundy 2010).

In referring to multiple sources of sociological literature, theory and research, O’Connor (2009, 124) asserts that the role of socio-economic status is ‘unequivocal ... in affecting individuals’ educational and social outcomes’. In the US, a large scale study on the relationship between academic performance and socio-economic status in higher education students identified that students from low socio-economic status were proportionally underrepresented in high academic achievement categories (measured through membership to academic honours societies and achievement

of academic honours) (Bowen, Kurzweil and Tobin 2005, 113). In South Africa, academic achievement and success rates are worse for students from lower socio-economic circumstances (Letseka and Maile 2008, 31), and student poverty consistently appears as a factor that influences academic achievement (CHE 2010).

In addition to the abovementioned socio-demographic variables of socio-economic status, and 'race' and gender, previous educational achievement has also appeared as an explanatory factor in the higher education academic achievement trajectory. For example, research on equity and academic achievement in a select group of universities in the US affirmed the predictive power of school results (even when controlling for socio-economic status) with levels of academic achievement at university (Bowen, Kurzweil and Tobin 2005). However, making comparisons between the previous and current educational performance of students from diverse educational and social backgrounds is problematic when those students' backgrounds are located in enduring political, racial and socio-economic inequity (Loock and Grobler 2004, 75). In the past, South African matriculation results were found to have differential predictive validity according to school background, race and gender (Huysamen 2001, 133). Specifically, South African matriculation results tended to over-predict academic achievement in higher education for students from historically black schools and males from historically white schools. In contrast, the matriculation results of female students from historically white schools were often under-predictive of academic achievement at university. Although there do not appear to be any recently published studies on the differential predictive validity of matriculation results according to 'race', this finding has been affirmed by Van der Flier, Thijs and Zaaiman (2003) and Foxcroft and Stumpf (2005). However, these studies emphasise how academic achievement in mathematics and science based university courses (when compared to other university courses) is more closely correlated with matriculation results.

Dominant higher education discourses have focused on facilitating physical and epistemological access (Morrow 2009) to higher education for black South Africans, remediating educational disadvantage, language and academic literacy concerns, and enhancing retention and throughput (CHE 2010, 33–39). As a result, constructs of 'race', educational disadvantage, language, and retention and throughput have at times become conflated. Even though race may still be a reliable indicator of (educational and socio-economic) disadvantage in South Africa (Soudien 2010, 221), it is important that transformative discourses on disadvantage, race and academic achievement are developed and engaged with (Marshall and Case 2010). In light of the above and with specific reference to South African higher education at the undergraduate level, the following research questions were examined in this study:

1. Who falls within the exceptional academic achievement category?
2. What socio-demographic and educational factors are associated with exceptional academic achievement?

METHODOLOGY

A contextually relevant institution: Constituting a graduation sample

The authors acknowledge their positional interest in the University of KwaZulu-Natal (UKZN); all three are employed at UKZN and are interested in the advancement of the quality of learning and academic achievement at the institution. However, the authors also argue that selecting UKZN as the site of the study was justified on two grounds. This was a study about exceptional academic achievement in the South African higher education environment, and so (within the scope of the study) it was important to locate this within a relatively high performing and demographically and socio-politically transformed and representative institution. Although world university ranking systems do not specifically measure undergraduate academic achievement, UKZN does feature consistently in these ranking systems as one of the top five research institutions in South Africa (Kahn et al. 2007). Among these ‘top five’, UKZN is the only institution that has been part of the process whereby disadvantaged and advantaged South African higher education systems have been merged with the aim of creating ‘an equitable and accessible system of higher education [that would redress] racial, ethnic, linguistic and gender disparities’ (Mabokela and Evans 2009, 209). In relation to other South African higher education institutions, UKZN’s student and staff equity profiles are relatively reflective of the South African population. Therefore, it was on the basis of both high performance and contextually relevant transformation that UKZN was deemed appropriate as a representative site where exceptional academic achievement in South African higher education could be explored.

Permission to access UKZN enrolment and graduation records was granted by the relevant institutional gatekeeper, and ethical approval was granted for the study by the UKZN Humanities and Social Science Research Ethics Committee (protocol reference number: HSS/1247/011D).² Data for students who enrolled for and graduated from undergraduate bachelor’s degrees between 2006 and 2010 (inclusive) was requested from UKZN’s Division of Management Information. Data cleaning of the graduation records resulted in the removal of some entries with missing data on theoretically relevant variables (Katz 2011), and the removal of the relatively small (and hence statistically insignificant records) for graduates identified as ‘other’ and ‘Coloured’ in the ‘race’ categories.

The final sample included 20 120 records of graduates who completed undergraduate degrees from UKZN between the years 2006 and 2010. Within this sample, 641 (3%) of the graduates completed their degrees *cum laude* or *summa cum laude*, and this was assumed to infer exceptional academic achievement.

Data analysis and variables

The research design involved descriptive and multivariable statistical analyses, aimed at specifying the type of association and interaction that exists between selected contextually driven socio-demographic and educational variables, and exceptional academic achievement at UKZN. The outcome variable for this study was defined as a dichotomous 'graduation type' variable, which indicated whether a student graduated, or whether they graduated *cum laude* or *summa cum laude*. The latter two categories both recognise an extended period of exceptional academic achievement at the undergraduate level, and were collapsed into one group of exceptional academic achievers for this study. In their study on higher education success in Hispanic students, Crisp and Nora (2010, 175) developed several logistic regression models to test a conceptual framework in relation to the dichotomous outcomes of student success (Yes or No). In the study reported on in this article, logistic regression was used to test a range of available contextual variables in South African higher education in relation to their association with exceptional academic achievement. Although discriminant analysis and CART can also be used to predict membership of a dichotomous group, logistic regression allows for flexible assumptions pertaining to the predictor (independent) variables. Specifically, 'the predictors do not have to be normally distributed, linearly related, or of equal variance within each group' (Tabachnick and Fidell 2007, 517). Available predictor variables that were used in this study included 'race', gender, whether the student received funding for their studies via the National Student Financial Aid Scheme, matriculation score, and matriculation English symbol. All graduates included in the sample completed the Senior Certificate Examination for matriculation (that is, matriculated prior to the implementation of the National Senior Certificate in 2008). When checking for multicollinearity, none of the variables scored a variance inflation factor (VIF) higher than 2.5 (Allison 2012, 60). An essential model building strategy involves the inclusion of interaction effects between predictor variables, the most commonly occurring in higher education research being 'race' and gender (Peng et al. 2002, 280). The outcome variable, five predictor variables, and the logistic model specification are presented in Table 1. The logistic regression model was evaluated via Peng et al.'s (2002, 268) recommendations and also drew upon guidelines drawn from relevant publications (for example, Bahr 2008; Crisp and Nora 2010; Lundy 2010; Newman and Petrosko 2011; Veenstra 2011).

Table 1: Specifications for the logistic regression model

Variable	Definition and coding
Outcome variable	
Exceptional academic achievement	Student graduated <i>cum laude</i> or <i>summa cum laude</i> from undergraduate degree: Yes = 1, No (reference group) = 0.
Socio-demographic variables	
Race/gender	Six race/gender categories were included in the analyses, namely African female = 1, African male = 2, Indian female = 3, Indian male = 4, white male = 5, and white female (reference group) = 0.
Financial aid	An assumed indicator of socio-economic status. If a student received financial aid, it was assumed they were financially needy: Yes = 1, No (reference group) = 0.
Pre-university educational variables	
Matriculation score	A score calculated for university entrance purposes from the student's performance in their matriculation final school-leaving examinations.
Matriculation English Symbol	An indication of the student's performance in English as a matriculation subject with final examination performance being reflected with symbols of A to F. In this study, the coding A = 6, B = 5, C = 4, D = 3, E = 2, and F = 1 was used.

RESULTS

Describing graduates and exceptional academic achievement

Socio-demographic variables

During the period 2006 to 2010 (the time within which the sample of UKZN graduates was drawn), 115 671 undergraduate student registrations at UKZN were recorded. Table 2 reflects the percentage of all undergraduate student enrolments by race and gender subgroups (first row). Within the graduation sample of 20 120 graduates (see Table 2, row 2), African and Indian students constituted the majority with 39 per cent and 44 per cent respectively, while white students (17%) made up the balance. Overall, 23 per cent of the sample included graduates who were awarded need-based financial aid, while the remaining 77 per cent were either self-funded or recipients of scholarships or bursaries. Table 2 (third and fourth rows) also

captures the proportions of African, Indian, and white students in the sample who received financial aid for their studies, and their average graduate rates for the years 2006 to 2010. Graduation patterns across the years identified increasing proportions of African graduates (from 35% in 2006 to 49% in 2010). The inverse was observed for Indian (from 45% to 39%) and white (20% to 13%) students. Female students constituted 59 per cent of the graduation sample (and 56% of the enrolment sample).

Table 2: Socio-demographics of enrolment and graduation at UKZN (2006–2010)

	African		Indian		White	
	Female	Male	Female	Male	Female	Male
Enrolment						
Proportion of enrolled undergraduate UKZN student (N = 115 671)	27%	24%	23%	15%	6%	6%
Graduation						
Proportion of graduation sample (N = 20 120)	23%	17%	27%	16%	9%	8%
Proportion of graduation sample who received financial aid	49%	50%	11%	8%	1%	1%
Graduation rate per race/gender subgroup ^a	14%	12%	21%	19%	28%	25%
Graduation type						
Proportion of exceptional graduates in graduation sample (n = 641)	1%	2%	28%	14%	38%	17%
^a Graduation rates were calculated by dividing the number of students (per race/gender subgroup) graduating from undergraduate degrees by the number of undergraduate students (per race/gender subgroup) registered at UKZN during the 2006 to 2010 period.						

Pre-university educational variables

Descriptive statistics pertaining to the pre-university educational variables of matriculation score and matriculation English symbol for all graduates in the sample were: mean matriculation score = 36.29 (SD = 7.32); mean matriculation English symbol = 4.37, (SD = 1.13). For exceptional graduates in the sample, the descriptive statistics of the abovementioned variables were: mean matriculation score = 44.87 (SD = 5.57); mean matriculation English symbol = 5.57 (SD = 0.73).

Outcome variable (exceptional academic achievement)

Of the 20 120 graduates included in the sample, 641 (3%) graduated from their undergraduate degrees *cum laude* or *summa cum laude*. The proportion of exceptional academic achievers per race/gender subgroups (and the proportion within each race/gender subgroup) is also included in Table 2 (fifth row). Graduation patterns from 2006 to 2010 were also considered, and the proportion of African graduates who excelled academically increased as the proportion of African graduates increased. Specifically, only 1 per cent of all exceptional academic achievers in 2006 were African, while in 2010, 5.9 per cent of the exceptional academic achievers were African.

Logistic regression analyses

In specifically addressing the second research question (that is, which socio-demographic and educational factors are associated with exceptional academic achievement?), a logistic regression model was developed. Although an evaluation of the model is included in the results, the focus of the results is on the way in which individual predictors influence the likelihood of exceptional academic achievement in South African higher education (Meyers, Gamst and Guarino 2013, 240). Table 3 contains the estimates that were obtained for the individual predictors from the logistic regression model fitted with interaction terms and an indication of the model evaluation.

Table 3: Estimates for the logistic regression model

Predictor	B	S.E	Odds ratio ^a
<i>Quantitative sample (N = 20 120)</i>			
Race/gender ^b			
African female	-2.795***	.348	.061
African male	-1.879***	.290	.153
Indian female	-1.596***	.109	.203
Indian male	-1.684***	.136	.186
White male	-.629***	.130	.533
Financial aid	-.882**	.293	.414
Matriculation score	.175***	.012	1.191
Matriculation English symbol	.505***	.079	1.657
Constant	-11.889	.460	
Model evaluation			

χ^2	1569.582***		
-2 Log likelihood	4110.113		
Cox and Snell R^2	.075		
Nagelkerke R^2	.305		
Hosmer and Lemeshow χ^2	52.814***		
^a Odds ratios only reported for statistically significant coefficients ^b White female = reference category * $p < .05$; ** $p < .01$; *** $p < .001$			

The model suggests that all available socio-demographic and pre-university educational variables (that is, of 'race' and gender, financial aid allocation, matriculation score, and matriculation English symbol) have a strong influence on the odds of academic exceptionalism. When compared with white female students (the reference group), African female, African male, Indian female, Indian male and white male students were significantly less likely to excel academically. A one unit increase in matriculation score increases the odds in favour of being an exceptional academic achiever by a factor of 1.19 when controlling for 'race' and gender. A one symbol increase in matriculation English symbol increases these odds by a factor of 1.66. Financial aid allocation significantly reduces the odds of being an exceptional academic achiever. Although the overall model was found to be significant with χ^2 (8, N = 20 120) = 1569.582, $p < .001$, the Hosmer and Lemeshow chi-square was statistically significant where χ^2 (8, N = 20 120) = 52.814, $p < .001$. This suggests that this is not an acceptable model to use for predicting exceptional academic achievement (Tabachnick and Fidell 2007).

Data limitations

The results from the descriptive statistics and logistic regression model should be interpreted with three data limitations in mind. One concern is the likely inadequacy of financial aid as an indicator of socio-economic status. Although a graduate who received financial aid could be reliably assumed to come from a low-income family (as required for the allocation of financial aid), the inverse is not necessarily true for graduates who did not receive financial aid. It is possible that those graduates in the sample who did not receive financial aid may have included graduates from low income families who received other forms of funding (for example, bursary, scholarship). Although this is a concerning limitation, the allocation of financial aid was included in the model as it was the only measure of socio-economic status available.

Secondly, the outcome variable of 'graduation type' (*cum laude/summa cum laude* graduate or not) in this study may be considered an extreme indicator of exceptional academic achievement in higher education. Graduating from an

undergraduate degree may indeed be an exceptional academic achievement for many students. In addition, a continuous outcome variable such as credit weighted average may have yielded a more nuanced continuum of academic achievement.

DISCUSSION

The study reported on in this article profiled the phenomenon of exceptional academic achievement at UKZN, with the intention of contributing to contemporary discourses around equity and the quality of graduate outcomes in higher education. More specifically, the study explored the socio-demographic and pre-university educational variables that were reliably associated with the phenomenon of exceptional academic achievement. The final discussion of the article will firstly explore and explain the descriptive statistics and logistic regression model in more detail. Secondly, it will highlight some recommendations for South African higher education policy, practice and further research.

Descriptive statistics pertaining to enrolment (registration at UKZN), throughput (graduation from UKZN) and quality of throughput (graduation type) were provided for UKZN undergraduate students between 2006 and 2010. UKZN's enrolment and throughput patterns depict an institution that is successfully registering and graduating representative proportions of black South Africans (91% registration and 83% graduation). However, the varying graduation rates for each 'race'/gender subgroup and proportion of exceptional academic achievers within these subgroups depict lagging patterns of equity. The graduation rate for African males was the lowest at 12 per cent, followed by African females (14%), Indian males (19%), Indian females (21%), white males (25%), and white females (28%). This pattern is mirrored when comparing the proportion of exceptional academic achievers per 'race'/gender subgroups. At around four times the average rate of exceptional academic achievement in the entire graduation sample (that is, 3%), 13 per cent of white female students excel academically, this dropping off to 7 per cent for white males, 3 per cent for Indian females, 3 per cent for Indian males, 0.4 per cent for African males, and 0.2 per cent for African females. A year on year analysis does, however, show steady improvements in exceptional academic achievement for African graduates relative to their proportion. In summary, a more nuanced analysis of undergraduate registration, graduation, and the quality of academic achievement (graduation type) reveals lagging patterns of 'race' and gender equity in South African higher education. At the input and throughput level then, UKZN seems to be achieving in relation to equity and transformation goals. However, it is evident that much more needs to be done in the attainment of equity in the high-end quality of these outputs.

The model for the sample of 20 120 graduates suggests that all predictor variables ('race' and gender, financial aid, matriculation score, and matriculation

English symbol) are strongly associated with exceptional academic achievement at UKZN. Although the overall model fit is not necessarily adequate for prediction purposes, the individual predictors in the model do provide a significant and reliable basis for reflecting academic exceptionality. In particular, it was observed that white female students were significantly more likely to excel academically when compared with other 'race'/gender subgroups. Similarly, increases in matriculation score and matriculation English symbol are also associated with increased odds of academic exceptionality at the undergraduate level. Conversely, receiving need-based funding appeared to be negatively associated with academic exceptionality, confirming the likely relationship between socio-economic status and higher education success. This profile of exceptional academic achievement in UKZN undergraduate education closely mirrors the trend reported earlier in relation to national higher education throughput indicators. The variables of 'race', gender, socio-economic status, matriculation results and language were found to feature centrally in relation to academic (under)achievement in the South African higher education context, and this study affirmed their association when considering exceptional levels of academic achievement. In addition, the logistic regression model for the full sample allowed the authors to control for possible confounding effects when considering exceptional academic achievement at UKZN. The model highlights that inequities pertaining to socio-demographic variables ('race', gender and socio-economic status) persist even when controlling for pre-university educational variables such as matriculation score and matriculation English symbol. This implies that even when African and Indian students enter university with relatively higher matriculation scores and matriculation English symbols, the likelihood that they will excel academically is significantly reduced when compared with white students. This is especially so when compared with white female students, the trend being observed despite declining enrolments of white students at UKZN.

The profile observed for academic exceptionality in UKZN undergraduate education reinforces the positive influence of pre-university academic performance and socio-economic advantage within an exceptional academic achievement trajectory. Students who benefit from and excel in well-resourced primary and secondary education systems are likely to continue to do so in higher education. White students appear to still be at a relative educational and socio-economic advantage prior to and during higher education, this probably informing their increased likelihood of academic exceptionality in the South African context. However, it is observed that white female students significantly outperform their white male counterparts, this confirming the findings from other South African studies (Ochse 2003; 2005). This raises interesting questions around the dynamics of gender empowerment and transformation in white South African communities, which remain outside a strong research gaze. Similarly, questions around sociocultural and/or self-imposed

expectations of exceptional academic performance for women in these contexts are relevant to ask.

In addition, the model of the graduate sample suggests that UKZN has been less successful in engaging and impacting students beyond their pre-entry academic achievement trajectories, and/or countering the adverse association between socio-economic status and (exceptional) academic achievement. Although most graduates (whether academically exceptional or not) would be transformed through their higher education studies, it appears as though this transformation is not yet at a point where it yields equitable representation in the cohort of exceptional academic achievers. The relevance and the importance of this point are grounded in the concurrent equity and quality aspirations of UKZN (and most other South African higher education institutions), relevant South African higher education policies that advocate for equity in higher education academic achievement (for example, the 2013 White Paper) and Rivera's (2005) notion regarding the complementarity of higher and lower ends of the academic achievement spectrum. In addition to reflecting a profile of students who are most likely to excel, the profile inversely reflects those who are least likely to excel.

Highlighting gross inequities in the quality of throughput, this model affirms that African students (especially African female students) and students from poorer socio-economic circumstances are at a significant and relative disadvantage to other students when it comes to excelling academically in higher education. Attaining academic exceptionality has concrete value for institutions, the individual, and his/her community. A student who excels academically at university is likely to receive status and prestige in relation to his/her academic achievements. Moreover, these achievements are likely to improve the student's financial and long-term career prospects, and therefore have a subsequent transformative effect for that individual and his/her family. As a physical and symbolic space where high-level academic engagement is expected, it is likely that any higher education institution would value and aim to maximise exceptional academic achievement. Academic attainment is core to higher education, and by virtue of this, superlative forms within this domain of achievement would be highly and inherently valued. This is most explicitly reflected in the financial reward systems in place for high academic achievers in higher education. In addition to bringing prestige to their university, high academic achievers are also more likely to access and have merit-based funding opportunities available to them, as well as increased likelihood of acceptance for postgraduate study and graduate employment opportunities.

Implications for practice and research

If Coleman's (1967) historic definition of educational equity as being inclusive of both equity in educational access and achievement is ascribed to, then in principle it

is of relevance to work towards the equitable representation of students who excel academically. This will require an integrated focus on developing students and staff in higher education institutions to have higher expectations that foster and encourage exceptional academic achievement. As mentioned earlier, there are already a range of programmes and interventions in place in South African higher education institutions that aim to address concurrent issues of equity and academic (under) achievement (Wilson-Strydom 2010). Initiatives aimed at enhancing exceptional academic achievement alongside equity are less evident. An example, however, is the Golden Key International Honour Society, a multinational society with South African representation. The Society provides membership to the top 15 per cent of academic achievers in all South African university degree programmes, and focuses on recognising high academic achievement, providing leadership development and career networking opportunities for its members (<http://www.goldenkey.org.za>). At an institutional level, some examples are the University of Witwatersrand's Student Equity and Talent Management Unit (SETMU) and the UKZN Women in Science, Engineering and Agriculture (WOSA) scholarship programme. Both SETMU and WOSA have focused on concurrently enhancing equity and academic achievement in the science, engineering and technology fields. The outcomes from this study reinforce the need for profiles of such programmes to be raised, and also for the proliferation of similar programmes across disciplines and South African higher education institutions. Discourses pertaining to exceptional academic achievement and equity need to be assisted to gain momentum in South African higher education, these potentially functioning to counterbalance current dominant discourses of academic underachievement and failure.

The results from this study have several implications for further inquiry and research. In exploring the proposed value attached to exceptional academic achievement and to understand how best to increase the numbers of high-end performers, longitudinal studies of graduates who excel in South African higher education could be conducted. It would be of relevance to explore the typical post-graduation study and career trajectories of these kinds of graduates. A particular focus for these kinds of studies could be on identifying the possible associations between exceptional academic achievement at the university level and subsequent achievements in society. Secondly, although this article proposed a model of exceptional academic achievement for UKZN, it would also be relevant to explore examples of academic exceptionality that do not fit the proposed model. In addition, although the model does not serve a transformative agenda in itself, it does provide a reliable basis for further inquiry into the phenomenon of exceptional academic achievement. In turn, this inquiry could inform how transformation and equitable representation within exceptional academic achievement is possible. The model confirms severe levels of inequitable representation in the cohort of exceptional academic achievers, this inequity pertaining primarily to African students, and

students who come from poorer socio-economic backgrounds. In an attempt to understand how some students who are unlikely to excel do indeed excel, the current and historical processes that these kinds of students have engaged in need to be explored. An outcome of this could be to foreground discourses around academic excellence and exceptionality in spite of or arising from educational and others forms of disadvantage.

CONCLUSION

This article has focused on the quality of academic achievement through an examination of exceptional academic achievement in South African undergraduate higher education. Focusing on contextually driven socio-demographic ('race', gender and socio-economic status) and educational variables (matriculation score and matriculation English symbol), a logistic regression model of exceptional academic achievement in South African higher education was proposed. The development of a logistic regression model for exceptional academic achievement in South African higher education is novel, uncovers levels of inequity within parameters of exceptional academic achievement, provides a basis for engaging with the phenomenon, and contributes to discourses that aim to transform the quality and equity of high academic achievement in the sector. In addition to being aligned with the academic aspirations of most, if not all South African higher education institutions, the value of this study lies in its potential contribution to continuing transformation by raising the bar in the discourse and actions of institutions. Although some inquiries into exceptionality have been deemed elitist and reiterative of dominant social structures (Gardner 2002, 13–14), this study is positioned within an interdependent higher education and socio-economic transformative context. In addition, although the results reveal entrenched inequities according to 'race', language, and socio-economic and educational background, it also reveals the gendering of exceptional academic achievement, and is therefore not reiterative of hegemonic masculinity. Ideological and applied tensions between equity and excellence in education are not new, however, this study contributes to the synthesis of these constructs in contemporary South African higher education.

NOTES

1. The requirements for graduating *cum laude* and *summa cum laude* from an undergraduate degree at UKZN include completing a degree in minimum time, obtaining passes in all modules upon first attempt, and obtaining a credit weighted average of 75 per cent (80% for *summa cum laude*).
2. The study reported on in this article formed part of the first author's mixed method doctoral study of exceptional academic achievement at the UKZN.

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