FOSTERING QUALITY GRADUATES THROUGH ACCESS PROGRAMMES

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Abstract

The purpose of this paper is to argue that the quality of a Building graduate is not compromised by qualifying through the access programme route. This paper examines the statistics of the 2005 and 2006 access programme and mainstream National Diploma Building cohorts as well as the 2007 mainstream cohort. The study made use of descriptive research comprising quantitative data. The quantitative data was derived from statistics based on student performance that was downloaded from the Management Information System of the University of Johannesburg. The findings revealed that, although the access Building students enter the access programme with results below the minimum entrance requirements for the national diploma, their graduation rate is above or equal to that of their mainstream peers who gained entry directly into the national diploma. Furthermore, many of these students register for post-graduate studies once they start working. This study confirms that students who have received additional support in their first year of study and who have been 'enculturated' into the 'ways of doing' of construction and engineering during a four-year access diploma programme are not inferior to students who have completed a mainstream diploma in 3 years.

Keywords: Access programmes; enculturated; 'ways of doing'; foundational provision; academic development

1.   INTRODUCTION

The provision of manpower for the construction industry takes many forms and there are various pathways through which future employees can be trained for this industry. University graduates enter the industry either from a mainstream programme or from an extended access programme. Although students in access programmes often start their studies with lower matric results than their mainstream peers, this paper will argue that the quality of an engineering graduate is not compromised by being in an access programme.

The broadening of access to higher education has made higher education, which was previously the privilege of a select few, available to the majority of students. This has resulted in underprepared students who "are not as high achieving as the select few that attended in the past" (van der Meer, Jansen & Torenbeek, 2010; Mori, 2002) entering higher education institutions.

Academic development at the University of Johannesburg (UJ) focuses on enhancing the quality and effectiveness of teaching and learning, particularly in relation to equity of access and outcomes. Since 1999, the ADCA (Academic Development Centre: Access) of UJ has offered access programmes for students who do not meet the minimum entrance requirements for mainstream National Diplomas in Engineering. Access programmes is an umbrella term for bridging, foundation and extended diploma programmes. The access students complete their National Diploma in four years in contrast to the three year mainstream National Diploma. The extension of time allows for the integration of foundational provision into the programme. It also provides students with the opportunity to apply theory to real-life situations, to tackle an array of case studies and to go on site visits in order to become familiar with the terminology of engineering and with what engineers do. Thus, in the UJ access programme context, students have the opportunity to develop both cognitively and non-cognitively as a result of the enhanced teaching and learning that takes place during the process of formal learning offered by the programmes.

Many universities in South Africa offer access (support) programmes for engineering students, however, there is a danger that these students might be perceived to be less prepared or inferior to their mainstream peers as a result of the additional support that is offered to them. The aim of this article is to indicate how the students' experiences during the access programme at the University of Johannesburg enhance the quality of the engineering graduate. The rationale for this study was to counter the perception of industry that students entering the market via the access route might not be as competent as mainstream students.

The first section of this article will discuss the outcomes that are strived for, as well as the principles, characteristics and methodology of access programmes at a South African university. Thereafter will follow a discussion of the results of the 2005 and 2006 access and mainstream Building cohorts which indicates how the quality of these access graduates is not compromised as a result of the support that they are offered in the access programmes. Lastly, a discussion of the important role that the 'enculturation' of students into engineering and the role that the provision of a solid academic foundation plays in producing a quality graduate will follow.

2.   THEORETICAL FRAMEWORK

Principles underpinning the access programmes

The relevant principles that underpin the access programmes of the ADCA are the following: content is based on the needs of first year students not on the matric syllabus; innovative strategies and teaching methodologies are employed to ensure the acquisition and application of skills rather than the rote-based learning of content (Louw, 2012; Scott, 2009); the students' prior

knowledge is not taken for granted and the 'articulation gap' experienced by underprepared students is filled by presenting content in a scaffolded manner in order to provide students with the support and structure which they require (Krause, 2006; Scott, 1995); regular monitoring of students' progress is carried out through continuous assessment (Onsongo, 2006); and a holistic approach is embraced which allows for students to be supported through both academic and non-academic problems (Pandor, 2008).

Advantages of the access programmes

Some of the advantages of the access programmes include the practical nature of the programme, the availability of more time for teaching and learning and the creation of an environment that is conducive to learning and self-development (O'Brien, 2010; du Plessis & Lodewyckx, 2007). During the course of the programme students are exposed to the basic principles and concepts of their chosen field of study in order to provide a contextualised introduction to their particular discipline. Extended time allows the lecturer to lecture more slowly and integrate "pre-first year material" into the curriculum (Parkinson, 2000) so that under-prepared students can gain the knowledge and skills that they might lack as a result of inadequate schooling. In addition, students are allowed time to make sense of the learning materials through engaging with case studies, tackling additional problems and applying theory to real-life situations (Scott, Yeld & Hendry, 2007). The nurturing environment boosts the self-confidence and self-esteem of under-prepared students which encourages their belief in their own capability (Habel, 2012; Schreiner & Hulme, 2008; Bandura, 1997) and, later on, also enables them to make the transition successfully from university to the world of work (Riner, 2003).

Methodology of the access programmes

In order for under-prepared students, who have not achieved the minimum entrance requirements for mainstream study, to be successful in the access programmes the methodology must differ considerably from that of mainstream programmes (van der Meer, Jansen & Torenbeek, 2010; Council for Higher Education, 2004; Jacobs & Jacobs, 2002; Paxton, 1993). The teaching and learning strategies employed initially to start the students on a path of guided but self-directed lifelong learning have precipitated a shift from lecturer-focused to learner-focused teaching (Purkey & Stanley, 1991). An example of this is that the access students are exposed to laboratories where they carry out experiments and conduct practicals in the relevant disciplines which allow them to view the results rather than learn about the results from a text book only (Steyn & du Plessis, 2002).

Since we cannot expect students entering university to already know how to respond to a reading list and a set of essay questions, or how to engage with texts and critically analyse them (Haggis, 2006), access programme lecturers make a realistic appraisal of the students' prior learning and knowledge.

This informs their starting point for teaching, unlike mainstream programmes in which the students' prior knowledge is taken for granted (Kaburise, 2011).

The learner handouts are manuals that have been developed specifically for these students to ensure that they are active participants in the learning process (Wilcox, Winn & Fyvie-Gauld, 2005; Tait, van Eeden & Tait, 2002). The content of the learner manuals also ensures that there are many varied opportunities for students to apply the theory learnt to numerous case studies and real-life situations (Mumba, Rollnick & White, 2003).

In access programmes theory is taught in small sections and each section is followed by case studies and examples which require the theory to be applied to real-life situations (Biggs, 2012; Johannessen, 2004). This strategy is supported by Biggs (1997) who maintains that the lecturer should "provide the scaffold to support students" which will give them a "better chance" to do what the outcomes require of them (van Schalkwyk, 2010). Since high school teaching makes extensive use of the rote-learning approach, students have little understanding of the fundamental principles of their subjects and, thus, struggle when they are confronted with more advanced content, the application of theory to real-life situations and the transfer of knowledge from one context to another. They also have problems engaging with the learning materials/manuals, textbooks and lecturers as the examples used are often not taken from their own frame of reference. This prevents them from integrating new information from textbooks and lectures into their existing knowledge. A further problem is that the language used in the materials and the lectures is not at the level of a second/third/fourth-language English speaker. Deficits in their English proficiency or mathematical and scientific ability impact directly on their performance in all other subjects (Shandler, 2009). It is thus essential that the content which is provided to students is scaffolded, so that they can grasp it in a step by step manner.

Students in the access programmes have multiple assessment opportunities each term in order to ensure regular monitoring of their progress. This approach is supported by Hunter (2006) who maintains that we must "incorporate ongoing and formative assessment into our work". Continuous assessment allows for the identification and tracking of at-risk students and indicates to the institution those areas that need subject-specific academic development interventions in order to ensure that the student receives appropriate additional support (Nelson, Smith & Clarke, 2012). These interventions are also recommended by Seidman (2003) who notes that "to retain a student, students-at-risk of failing should be identified at an early stage and early and intensive intervention programmes should be provided".

In the access programme students are no longer regarded as "vessels into which knowledge is poured" but rather as customers who participate in their own learning (Engstrom & Tinto, 2008).

Parkinson (2000) supports this statement when he claims that "sitting through lectures in which material is presented rapidly… is not an ideal learning environment". This is especially true for access students. As a result, access programmes endorse the collaborative nature of teaching and learning and reject any threatening, competitive or ranking practices. Access students are required to take responsibility for their own learning (Bovill, Bulley & Morss, 2011) and, when they are encouraged to do this, they learn that they and their peers are sources of knowledge (Conway, 2004; Parkinson, 2000).

The ADCA strives to present the access students with a learning experience that is as close to the reality of the world of construction as possible. Everything that the students learn is governed by the National Building Regulations and this compliance permeates all theoretical and practical activities that the students engage in. The learner materials that have been developed for the students contain many references to real-life situations, and actual examples of building materials are kept, ready for use in relevant lectures. The lecturers of the various modules utilise different tools to make the learning activities as close to the work situation as possible.

In the teaching of Construction Technology there are many activities which help to concretise the subject matter. For example, each student is required to have a steel tape measure to measure various building elements on the university campus. The students are required to identify and describe various types of masonry arches in the old houses on campus. They are taken to sites which have already been built, but which have a rich diversity of building elements, which are used to encourage debate among the students about which elements are appropriate for particular types of buildings. They are also taken on an annual field trip to a site which has elements dating back to 1905 (Department of Education, 2006). On their return to class the students are given a list of post-visit questions that are designed to provoke reflection as well as suggestions of alternative building methods which could have been used on the site. Group work assessments in the Construction Technology module are designed in such a way that each group is compelled to apply the relevant building regulations to whatever elements they construct (Barefoot, 2000).

The use of role play in simulated site meetings in the Construction Management module allows students to have a clear understanding of the responsibilities of the various parties in the construction industry.

3. RESEARCH DESIGN AND METHODS

The study was conducted within the positivistic paradigm. A descriptive, exploratory study was undertaken using quantitative data derived from five cohorts of first year Building students who were enrolled at the University of Johannesburg in 2005 and 2006.

Data collection

The five cohorts of students that were identified were as follows:

•   students who had registered for the Building access programme in 2005;
•   students who had registered for the mainstream Building national diploma in 2005;
•   students who registered for the Building access programme in 2006;
•   students who registered for the mainstream Building national diploma in 2006; and
•   students who registered for the mainstream Building national diploma in 2007.

Both mainstream and access students follow the same core curriculum in the same academic year but the extended period of the programme allows access students to complete the core modules over a longer period. The same lecturers teach these modules to both mainstream and access students. The access students write the same assessments as the mainstream students and these are moderated by the faculty staff members.

The information that was extracted was the students' performance in the access programme, their further completion of the national diploma and their registration for post-graduate studies where applicable. The student records were extracted from the Information Technology System (ITS) and the Higher Education Data Analyser (HEDA) tracking system of the University of Johannesburg. The individual global record of each student in all the cohorts was analysed and data were collected on the students who had graduated in minimum time, those students who were still in the process of completing modules in order to graduate, the number of students who had dropped out of the programme, those students who had registered for post-graduate studies and the total number of students who had registered for each cohort. The 2005 and 2006 cohorts were selected because these were the year groups for which the most recent statistics were available. Selecting these cohorts provided sufficient time to ascertain whether the students had completed their qualification and registered for post-graduate studies. The research was conducted during the first term of 2011 and the same method was used throughout all the cohorts.

Methods of Data Analysis

The data collected were analysed using descriptive statistics and interpreted in order to give a 'picture' of the students' performance. This involved organising the data, doing the calculations, making sense of the numbers and information to permit meaningful interpretation (lessons learned), and explaining the limitations.

The minimum time required for students who are registered for a mainstream national diploma to complete the diploma is three years whereas the minimum time required for students who are registered for the extended national diploma to complete the extended diploma is four years.

Two sets of comparison were done. The results of the mainstream and access students of the same year were compared as they had all been admitted to the University of Johannesburg in the same year. Subsequently, the results of the extended diploma cohorts were compared with the mainstream cohorts who enrolled one year later than them since all these students wrote the same exams in the last two years of their diplomas.

4.   FINDINGS AND DISCUSSION

In this section a comparison is made between the performance of students who participated in the Building access programme and those who entered the mainstream Building national diploma directly. The student records of the 2005 and 2006 access and mainstream cohorts were analysed and the results are presented below.

Figures 1 and 2 illustrate the 2005 mainstream and access Building students' performance respectively. Although the 2005 access cohort consists of a small number of students, percentages are included to facilitate further comparisons.
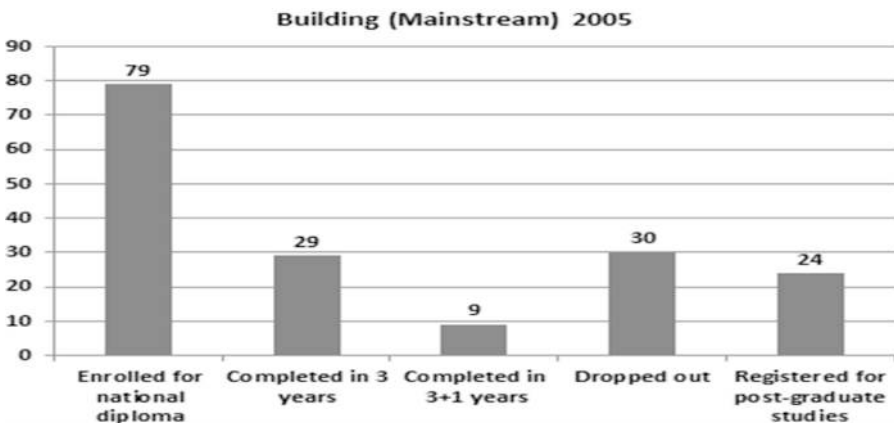

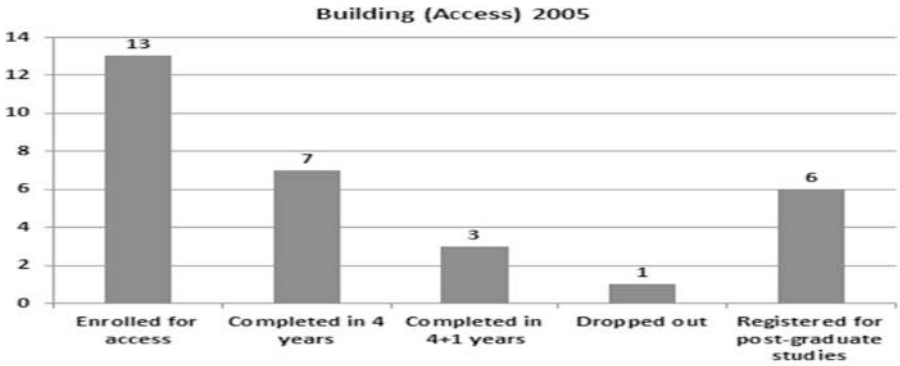Figure 1. Mainstream Building students: 2005 cohort

Figure 2. Access Building students: 2005 cohort

A comparison of the 2005 results, as illustrated in Table 1, reveals that the students in the access programme outperformed the students in the mainstream diploma percentage-wise. In addition, a greater percentage of the students are registered for post-graduate studies, although the effect of group size on the results is acknowledged.

Table 1. Comparison of 2005 mainstream and access cohorts

Cohort	Number of students enrolled	Graduated minimum time plus 1 year	Drop Outs	Registered for post-graduate studies
2005 Mainstream (Figure 1)	79	38 (48%)	30 (38%)	24 (30%)
2005 Access (Figure 2)	13	11 (77%)	1 (8%)	6 (46%)

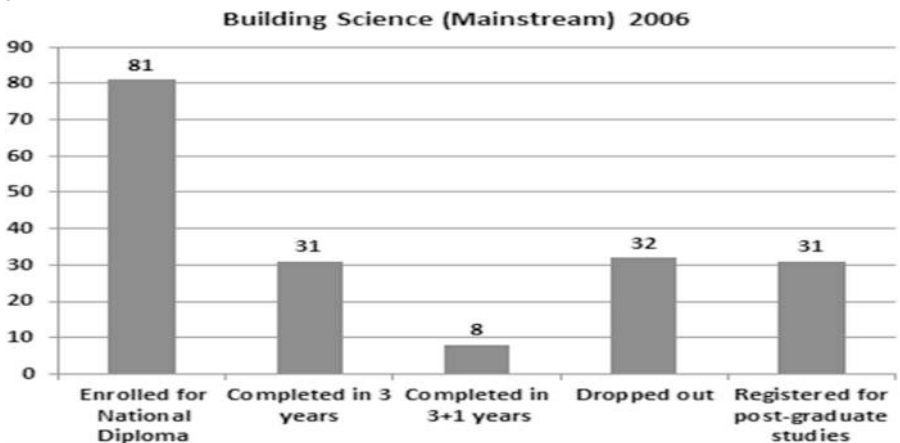Figures 3 and 4 illustrate the 2006 mainstream and access Building students' performance.

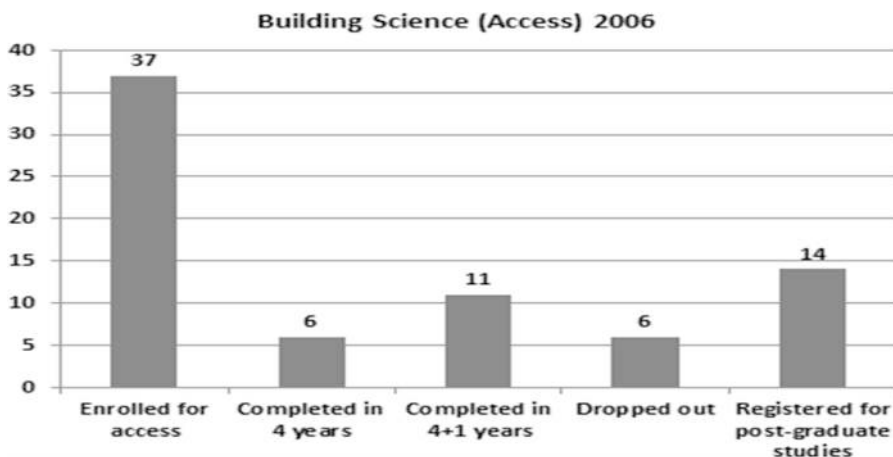Figure 3. Mainstream Building students: 2006 cohort

Figure 4. Access Building students: 2006 cohort

The trend that is evident from a comparison of the 2006 results, as illustrated in Table 2, is that the students in both the access and mainstream cohorts have performed at the same levels. However, one needs to bear in mind that the access students gained entry to the institution with entrance requirements that were below the entrance requirements for entry into the national diploma. With an additional year in which they were provided with support in the form of academic development and foundational provision these access students, who would have previously been denied access to higher education, have performed at the same level as those students who gained access with the minimum entrance requirements.

Table 2. Comparison of 2006 mainstream and access cohorts

Cohort	Number of students enrolled	Graduated minimum time plus 1 year	Drop Outs	Registered for post-graduate studies
2006 Mainstream (Figure 3)	81	39 (48%)	32 (40%)	31 (38%)
2006 Access (Figure 4)	37	17 (46%)	6 (16%)	14 (38%)

In addition to the previous comparison of the performance of students in access and mainstream diplomas who registered for their first year in the same year it is also necessary to compare the cohorts of students who wrote the same final exams in order to graduate.

A comparison of the 2005 access results and the 2006 mainstream results, as illustrated in Table 3, reveals that the students in the access programme outperformed the students in the mainstream diploma. Furthermore, very few students dropped out of the access programme and a greater percentage of the students are registered for post-graduate studies.

Table 3. Comparison of 2005 access and 2006 mainstream cohorts

Cohort	Number of students enrolled	Graduated minimum time plus 1 year	Drop Outs	Registered for post-graduate studies
2005 Access (Figure 2)	13	11 (77%)	1 (8%)	6 (46%)
2006 Mainstream (Figure 3)	81	39 (48%)	32 (40%)	31 (38%)

Figure 5 illustrates the 2007 mainstream Building students' performance.
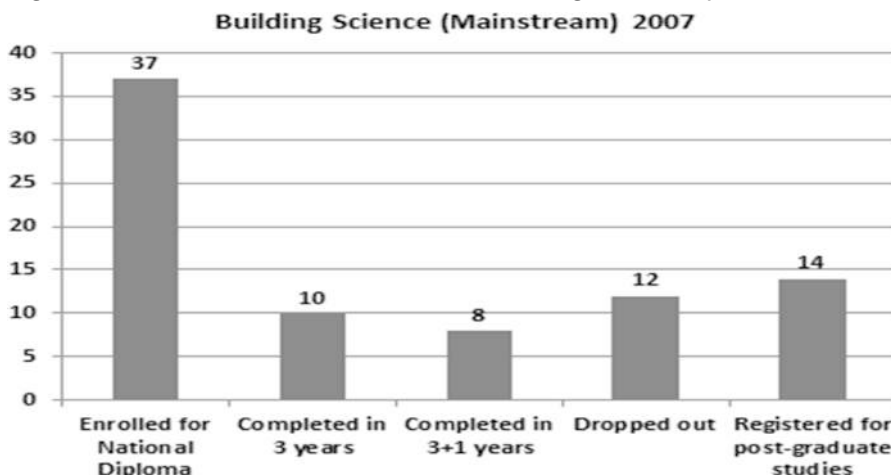

Building Science (Mainstream) 2007

Figure 5. Mainstream Building students: 2007 cohort

The trend that has emerged from a comparison of the 2007 mainstream results and the 2006 access results (Figure 4), as illustrated in Table 4, is that the students in both cohorts have performed at similar levels. However, once again cognisance must be taken of the fact that the access students entered the institution with lower entrance requirements than for entry into the national diploma. The extended time and academic development and foundational provision support allows for the access students, who would previously not have gained access to higher education, to perform at the same level as those students who gained direct entry into the national diplomas.

Table 4. Comparison of 2006 Access and 2007 Mainstream cohorts

Cohort	Number of students enrolled	Graduated minimum time plus 1 year	Drop Outs	Registered for post-graduate studies
2006 Access (Figure 4)	37	17 (46%)	6 (16%)	14 (38%)
2007 Mainstream (Figure 5)	37	18 (49%)	12 (32%)	14 (38%)

5.   CONCLUSION AND RECOMMENDATIONS

The preparation of quality graduates for the workplace remains one of the paramount outcomes of higher education. As a result of participating in the access programme the knowledge and skills of the building graduate are promoted since they have been provided with additional educational value and they are fit for purpose in industry. These graduates have had the additional time to improve their language abilities, develop higher order thinking skills, and participate in laboratories and site visits where they were exposed to the integration of the theoretical and practical components of subjects.

The Building access programme provides underprepared students with a strong belief in their abilities and emphasises the positive role that students can play in achieving success in their studies and the workplace by taking responsibility for their own learning and becoming actively involved in acquiring knowledge. The access methodology inculcates in students an academic ethos which demands that they respect deadlines, produce quality work and prepare thoroughly for tasks. Furthermore, the access students have learnt how to handle the pressure and stress related to their workload; these transferable competencies, knowledge and skills should make them desirable in industry.

Greater awareness should be created in industry about the kind of preparation that students are provided with in an access curriculum. This could dispel any possible fear of employing these students because they followed an alternative route, since this research indicates that the quality of an engineering graduate is not compromised by being in an access programme.

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In Memory of Ferdinand Christopher Abrahams. Construction Technology lecturer extraordinaire.