



Durban University of Technology

Promising Practice Case Study DUT General Education

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List of Acronyms

BUSSE – Beginning University Survey on Student Engagement

CSTN – Cornerstone 101 Module

DHET – Department of Higher Education and Train

DUT – Durban University of Technology

EVST – Environmental Sustainability Module

fte – full time equivalents

HEQSF – Higher Education Quality Sub-Framework

ICON – International Centre for Non-Violence

IGE – Institutional General Education

IGEMs – Institutional General Education Modules

UFC – Urban Futures Centre

UoT – University of Technology

Introduction

This case study focuses on the implementation of General Education at the Durban University of Technology up to 2018, as part of a broader curriculum renewal project. The study includes a broader context but focuses on the Institutional General Education Modules (IGEMs) which are serviced by the Centre for General Education. This includes the compulsory 12-credit Cornerstone module which students take in their first year, and three 8 credit elective IGEMs which students take during their programme. This combined is equal to 36 credits which is 10% of the required 360 credits for the 3-year HEQSF programmes.

The focus is on evidence-based practices that have improved the curriculum, broadened students' horizons, developed good teaching practice, and empowered students to achieve the DUT Graduate Attributes. DUT Centre for General Education was chosen as a case study because of promising practice evidenced in a number of ways, including: focus on student success and graduate attributes to measure student success; the use of technology in the management of the classroom register and mark capturing; the implementation of compulsory small group lecture attendance; and the reflective culture amongst General Education staff, in line with the active and reflective learner graduate attribute. In addition, the IGEMs serviced by the centre are serviced across all faculties at DUT, thus the impact that the Centre has is institutional and has the potential to significantly contribute to student success at DUT. DUT's Strategic Plan places students at the centre:

*"The notion of **student-centredness** is that DUT exists to provide its students with the kind of learning environment that helps them grow intellectually, socially and emotionally. Student-centredness is predicated on the University's understanding of its students and what they bring with them to this place of learning so that it designs its programmes, its interaction and social interfaces, its physical spaces and its technological capacities to impact maximally on their growth as rounded, productive, responsible human beings."* DUT Strategic Plan 2015-2019

Universities of Technology (UoTs) are traditionally linked "with workforce development" and have long been constrained by a tightly prescribed technical/vocational curriculum with very little or no social science component. The demand that students must graduate with skills, knowledge, attitudes and values that will enable them to participate fully both as citizens and professionals requires a critical paradigm shift in the way in which we envisage our mandate as a UoT in South Africa. DUT's curriculum and pedagogy has been intentionally designed to prepare our graduates for employment, while simultaneously preparing them for critical citizenship in an emergent and still fragile democracy. This curriculum project was envisaged as one of the major transformation projects of the University and included the introduction of General Education modules and the attainment of student graduate attributes.

The case study concludes with lessons learned from the four main areas of promising practice: Student success and graduate attributes to measure student success; The implementation of compulsory small group lecture attendance; The use of technology to closely monitor student success; and The reflective culture amongst General Education staff, in line with the active and reflective learner graduate attribute.

Background

From as early as 2009, a team of academics and support staff embarked on the curriculum development of a Fundamental Learning module for all first-year students. The concept of a

Fundamental Learning module was replaced in 2011 by a proposal from the Vice Chancellor's office, of the inclusion of a General Education component across undergraduate curricula.

Alongside the need for alignment of the University's programmes to the HEQSF, the Curriculum Renewal project was initiated as a defining Transformation project of the University from 2011. This project was a vehicle through which space was created for an engaged and vibrant process of learning and development for both staff and students. Within this context, a set of DUT graduate attributes were formally approved by the University's Senate in 2014.

DUT graduates will demonstrate achievement of being:

1. Critical and creative thinkers who work independently and collaboratively
2. Knowledgeable practitioners
3. Effective communicators
4. Culturally, environmentally and socially aware within a local and global context
5. Active and reflective learners

General Education in the context of DUT

The curriculum is central to the responsiveness of an institution to the various drivers of transformation and to its relevance to society. In 2014 the Senate agreed that all new HEQSF aligned programmes would contain a 30% General Education component, including a compulsory first year module known as Cornerstone. Senate approved a suite of general education modules clustered around (a) the global and work context, (b) the social context and (c) the personal context. Each of the general education modules had to demonstrate how student learning would help students (a) understand their local context (KZN), (b) develop competence in quantitative reasoning and (c) develop discipline and/or academic writing skills. Students thus develop such attributes as the capacity to cope with daily challenges, master the self and understand their role in the broader context through social interaction. General Education, while grounded in the daily life of a person, aims to build a student-centred educational experience embedded in the local context; to prepare students for an increasingly diverse and complex globalised work environment and to cultivate an engaged and critical citizenry in the context of an emerging and fragile democracy in an ever changing world order.

The broad goals of General Education at DUT are to help students think critically, develop values, understand traditions, respect diverse cultures and opinions, and most important, put that knowledge to use. General Education is holistic, not specialised; integrative, not fragmented. Students thus develop such attributes as the capacity to cope with daily challenges, master the self and understand their role in the broader context through social interaction. General Education is grounded in the daily life of a person: dealing with supervisors and co-workers, choosing work and social associates, managing the family, and spending leisure time in socially desirable and personally satisfying ways.

The model adopted for General Education at DUT is a combination of the core, the distribution and the decentralized models (Bourke et al., 2009). The Core Model is highly restrictive as it requires students to complete a prescribed set of common modules. The second is the Distribution Model which allows students to choose modules from various approved categories. The third is the Decentralised Model where the faculty or department decide on the General Education requirements for their programmes. General Education comprises 30% of the total curriculum of a programme. A combined model was adopted at DUT for undergraduate degrees and diplomas in the following allocation:

- 10% Institution-wide General Education Modules (IGEMs) (includes a 12-credit compulsory module – Cornerstone 101 and three 8-credit modules) [Core Model and Distribution Model]
- 10% Faculty specific General Education Modules (unique for each faculty) [Decentralised Model]
- 10% Programme specific General Education Modules [Decentralised Model].

DUT prior to the Curriculum Renewal Programme had a fixed curriculum typical of UoTs compared to an elective curriculum typical of traditional universities. General Education has the ability to create flexibility and choice in the curriculum for students to choose electives that they find relevant or have a natural affinity for, rather than being forced to take a prescribed set curriculum. In the re-curriculation process, some faculties made the choice for the students resulting in elective general education modules being in effect core modules. Other faculties allowed students to choose from a small basket of elective IGEMs.

Implementation of IGEMs 2015 onwards

As stated previously, the 12-credit compulsory module for all first years in the HEQF aligned programmes is Cornerstone. Cornerstone enrolments compared to first-time entering student enrolments for DUT from 2014 to 2019 is shown in Figure 1. The Cornerstone module was first offered in 2015 to 138 students in the Faculty of Health Sciences new degree programmes. There was a marked increase in offering of the General Education components in 2016 as more new HEQSF programmes came on board as shown by the increase in Cornerstone enrolments in 2016. In semester one of 2016, four IGEMs were taught to approximately Three thousand students from faculties of Accounting and Informatics, Applied Sciences, Health Sciences and Management Sciences across four sites of learning – ML Sultan, Ritson, Steve Biko and Riverside (Midlands). During the second semester of 2016, eight IGEMs were serviced to approximately 3 000 students. For the first semester of 2017 11 IGEMs were offered to approximately 3500 students across all sites of learning – excluding Brickfield campus, and across all faculties. By 2020 all 8536 first-time entering students will be in HEQSF programmes and Cornerstone enrolment is expected to be 9257 based on 10% repeating students from the previous years' cohort as shown in Figure 1.

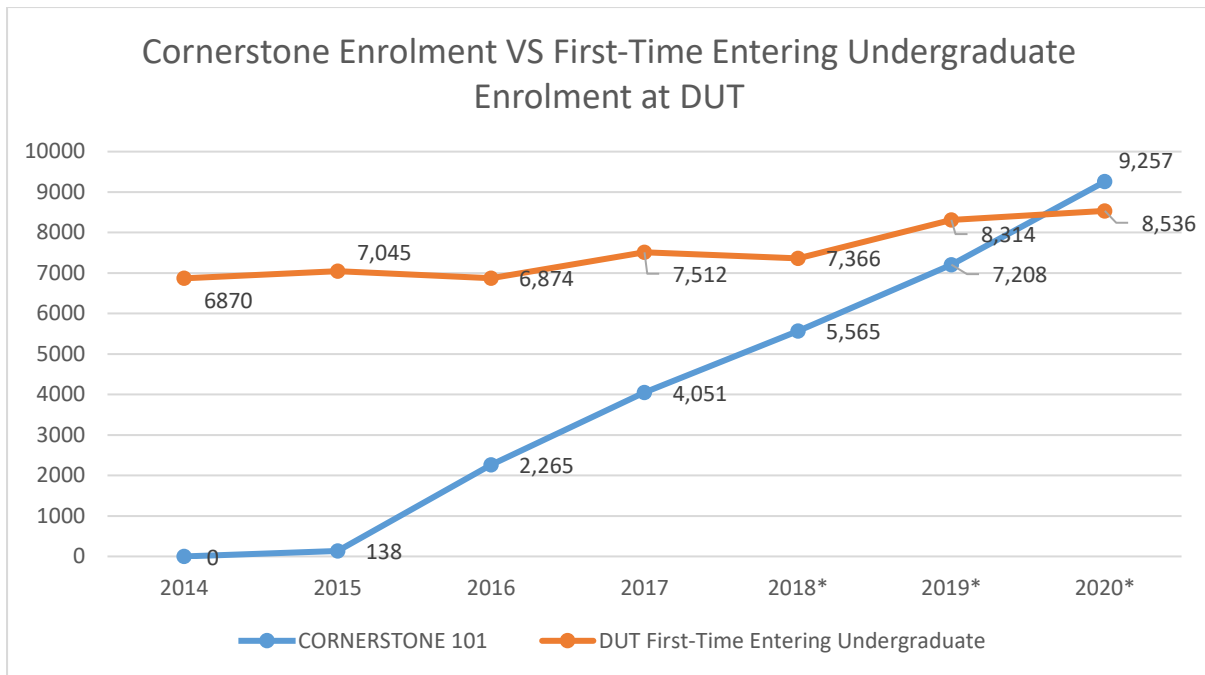


Figure 1 Cornerstone enrolments compared to first-time entering student enrolments for DUT from 2014 to 2019. The Cornerstone101 enrolments is actual enrolment data for 2015-2018 and estimated for 2019-2020. The DUT first-time entering undergraduate enrolments is actual for 2014-2017 and planned for 2018-2020. Years with planned enrolments are denoted with * next to the year.

The current staff for teaching the large classes for these modules has been one seconded staff member and part-time lecturers from ICON, UFC and Student Governance as well as outside of DUT. These staff have been assisted by part-time teaching assistants - senior post-graduate students who assist in the teaching and assessing of the smaller groups of the larger classes.

Focus of this case study

This case study will focus on the Centre for General Education that is responsible for the 10% Institutional General Education Modules (IGEMs), including the 12-credit compulsory first-year Cornerstone module and various other elective IGEMs. Some departments who had the expertise and capacity service selected IGEMs across the institution. This case study will only focus on the elective IGEMs that are serviced through the Centre for General Education. The Centre for General Education advertises, interviews, appoints, inducts and provides administrative support to the part time lecturers and graduate assistants who lecture the IGEMs, in contrast to IGEMs that are serviced and managed by other departments. For the purposes of this case study, where IGEMs is use, it refers to Cornerstone and the 8-credit elective modules that are serviced by the Centre for General Education.

The results and discussion will focus on four main areas of promising practice:

1. Student success and graduate attributes to measure student success;
2. The implementation of compulsory small group lecture attendance;
3. The use of technology to closely monitor student success; and
4. The reflective culture amongst General Education staff, in line with the active and reflective learner graduate attribute.

Description of the Institutional General Education Modules

Theoretical underpinning

The IGEMs are rooted in Transformative Learning Theory. Transformative Learning Theory says that the process of "perspective transformation" has three dimensions: psychological (changes in understanding of the self), convictional (revision of belief systems), and behavioural (changes in lifestyle) (Clark and Wilson 1991). Opportunities of perspective transformation are intentionally created by the lecturers through an assortment of learning opportunities including, but not limited to, facilitated classroom discussions, individual assessments, group presentations, project-based learning, service-based learning, and reflection exercises.

All IGEMs are continuous assessment modules and students do not write exams. Assessments are distributed throughout the semester with typically the individual assignment located in the middle of the semester and the group assignment at the end of the semester. Through close observation of students in the process of learning, the collection of feedback on students' learning, and the design of classroom experiments, teachers can learn much about how students learn and, more specifically, how students respond to particular teaching approaches (Angelo & Cross, 2012).

York-Barr, Sommers, Ghore and Montie (2011) define reflective practice as "a deliberate pause to assume an open perspective, to allow for higher-level thinking processes. Practitioners use these processes for examining beliefs, goals and practices, to gain new or deeper understandings that lead to actions that improve learning for students. Actions may involve changes in behaviour, skills, attitudes, or perspectives within an individual, partner, small group or school". This links to the perspective transformation of Transformative Learning theory discussed above. It is through the reflective practice that the perspectives of the students are transformed. The most commonly reflect-on-action framework used by Gen Ed lecturers is that of York-Barr et al. (2011) which in summary comprises 4 steps: 1) Select the event; 2) Analyse and interpret the event; 3) Make sense of the event; and 4) Think about implications for action. The guiding questions assist the students through the reflection process.

Cornerstone

Cornerstone is a 12-credit module with a two-hour large group lecture and a two-hour small group lecture per week. The purpose of Cornerstone is to induct students into the community of higher education, with values and practices that promote self-awareness, social justice and environmental sustainability. The module descriptor states that the learning outcomes are for students to:

1. Identify and critically interrogate particular constructions about themselves and others in the context of a diverse society.
2. Apply communication practices appropriate to higher education.
3. Demonstrate values of respect, accountability and responsibility in relation to a just society and a sustainable environment.

Cornerstone consists of an individual written assignment when students through interviews research the journeys of people (40%), a group presentation on a choice of topics (40%), small group lecture attendance 10% and reflective written submissions written during small group lectures (10%). Students need to attend more than 75% of their small group lectures in order to receive 100% otherwise they receive 0%. Because of the large number of students involved, this information is collected on weekly registers and captured electronically towards the end of the semester. The

number of students in a small group lecture varies between 25-37 students, in comparison to the large group lectures that can exceed 300 students depending on the venue size. DUT does not have the facilities to capture access data from student cards on campus so unless registers are taken in class, lecturers do not know how many of their students are on in class or on campus.

Elective Institutional General Education Modules

The elective IGEMs are 8 credits with two contact hours per week. The modules that have larger enrolment numbers have a 1-hour large group lecture and a 1-hour small group lecture per week. The smaller modules have a 2-hour combined lecture per week. Me, My World, My Universe MWMU101 is a numeracy and quantitative reasoning module and this piloted two 1-hour small group lectures per week in order to improve pass rates by having smaller class sizes. The assessments approach varies considerably. The modules that have been running for longer have reduced the number and type of assignments from the originally designed modules to align with the Cornerstone model in terms of number of assignments and split between individual and group mark.

Results and Discussion

Pass rates and graduate attributes to measure student success

Academic performance is frequently used as a measure of student success. Academic performance is a one-dimensional approach to student success. The section will present and discuss the academic performance for the IGEMs from 2015 to 2019 and present and discuss graduate attributes as a measure of student success. As previously stated, there is a link between the graduate attributes and the Curriculum Renewal Project at DUT. The graduate attributes are institutional and were intended to be implemented throughout the curriculum renewal process. The Centre for General Education has been perhaps the most successful in explicitly integrating the graduate attributes in the curriculum, in contrast to those who respond that the graduate attributes are “implicit” in the curriculum.

The student enrolment numbers and the success rates from 2015 to 2018 are shown in Table 1. The table shows the number of students enrolled across all campuses and for both semesters and annual students. The modules are sorted in descending order according to enrolment numbers for 2018, with the compulsory Cornerstone 101 module first, followed by the elective general education modules. Because Cornerstone 101 is consistently 12 credits across DUT, and the elective IGEMs are 8 credits in the HEQSF programmes, the success rate and pass rates are the same. The success rates (full time equivalents passed / full time equivalents enrolled) for the Centre of General Education from 2015-2018 is shown in Table 2.

Table 1 Showing the Institutional General Education Modules serviced by the Centre for General Education. The compulsory first year IGEM Cornerstone is highlighted on the table.

subject	2015		2016		2017		2018	
	sum no enrolled	% Pass Rate	sum no enrolled	% Pass Rate	sum no enrolled	% Pass Rate	sum no enrolled	% Pass Rate
BASICS OF GEOPOLITICS							39	90%
COMMUNITY ENGAGEMENT PROJECT					304	82%	389	89%
CONSTITUTIONAL LAW AND HUMAN RIGHTS			49	90%	76	95%	42	95%
CORNERSTONE 101	138	89%	2265	85%	4051	88%	5565	89%
CULTURAL DIVERSITY					31	81%	138	91%
DOING IT DIFFERENTLY: CHILD IN 21ST CENTURY							41	98%
ENVIRONMENTAL SUSTAINABILITY			1245	85%	1531	91%	1453	91%
EQUALITY AND DIVERSITY							88	98%
HANDS FILLED WITH MEANING					37	92%	42	93%
HIV AND COMMUNICABLE DISEASES IN KZN					52	98%	287	94%
INTERPERSONAL COMMUNICATION AND SELF							32	88%
INTRODUCTION TO SIGN LANGUAGE							230	89%
INTRODUCTION TO TECHNOPRENEURSHIP					95	98%	295	98%
LAW FOR LIFE			1041	94%	1831	93%	2136	87%
LEADERSHIP			30	97%	30	93%	92	91%
ME, MY WORLD, MY UNIVERSE			370	93%	550	71%	617	82%
SUSTAINABLE EARTH STUDIES			26	100%	109	86%	110	94%
THE ENTREPRENEURIAL EDGE					33	91%	198	99%
THE GLOBAL ENVIRONMENT					97	99%	210	97%
VALUES IN THE WORKPLACE			59	100%	175	96%	251	96%
VIOLENCE AND NON-VIOLENCE					27	93%	24	75%

Table 2 The full-time equivalents (fte's) passed and enrolled for 2015 to 2018

Year	Full time equivalents passed	Full time equivalents enrolled	Success Rate (FTE's passed/FTE's enrolled)
2015	12	13	89%
2016	357	409	87%
2017	634	714	89%
2018	891	994	90%
2015-2018	1895	2131	89%

The IGEMs consistently achieve above the DHET 80% pass rate guideline apart from Me, My World, My Universe in 2017 which achieved 71% in 2017 and Violence and Non-Violence which achieved 75% in 2018. The Me, My World, My Universe module requires students to have numeracy and quantitative reasoning skills which they apply in the module. The lower pass rate mirrors the lower pass rates for mathematical modules and can be attributed to the lower numeracy and quantitative reasoning ability of South African school-leavers who qualify for higher education (Prince and Frith, 2017). This module was targeted for intervention in 2018 and the delivery format was changed with the large group lecture being replaced by only small group lectures with class sizes of less than 35 students. The improved pass rate in 2018 can be attributed to the smaller class sizes and additional module improvements that were made. Further work will be done in 2019 to determine the interventions needed in Violence and Non-Violence in order to improve the pass rate.

In the second semester in 2017 an electronic survey was conducted with second year students in the Faculty of Accounting and Informatics to obtain feedback about how empowered students were to achieve the DUT Graduate Attributes in Cornerstone. The second-year students were targeted because they had taken Cornerstone the previous year, which would allow them time to see the benefit from taking the module. 34 students completed the survey and their responses are summarised in Figure 2.

Three out five respondents agreed/ strongly agreed that CSTN101 had empowered them to achieve all the DUT Graduate Attributes. Three out of four respondents agreed/strongly agreed that Cornerstone had empowered them to achieve DUT Graduate Attribute 3 (effective communicators) and 4 (culturally, environmentally and socially aware within a local and global context). Cornerstone emphasises and assesses both written and oral communication that students acknowledge improves their effective communication skills (DUT graduate attribute 3 effective communicators) as shown in Figure 2 with 3 out of 4 students agreeing and strongly agreeing. In addition, Cornerstone covers topics such as issues of identity, the journey, gender, HIV/AIDS, skills needed within a university and values which students acknowledge improves their cultural, environmental and social awareness within a local and global context. Three out of four respondents agreed and strongly agreed that Cornerstone empowered them to achieve DUT Graduate Attributes 5 (active and reflective learners). The emphasis on reflective thinking in transformative learning assists the students to become active and reflective learners.

Students responded more negatively concerning DUT Graduate Attribute 2 (Knowledgeable Practitioners). That is to be expected as students do not see the topics covered in Cornerstone being directly related to the profession for which they are studying.

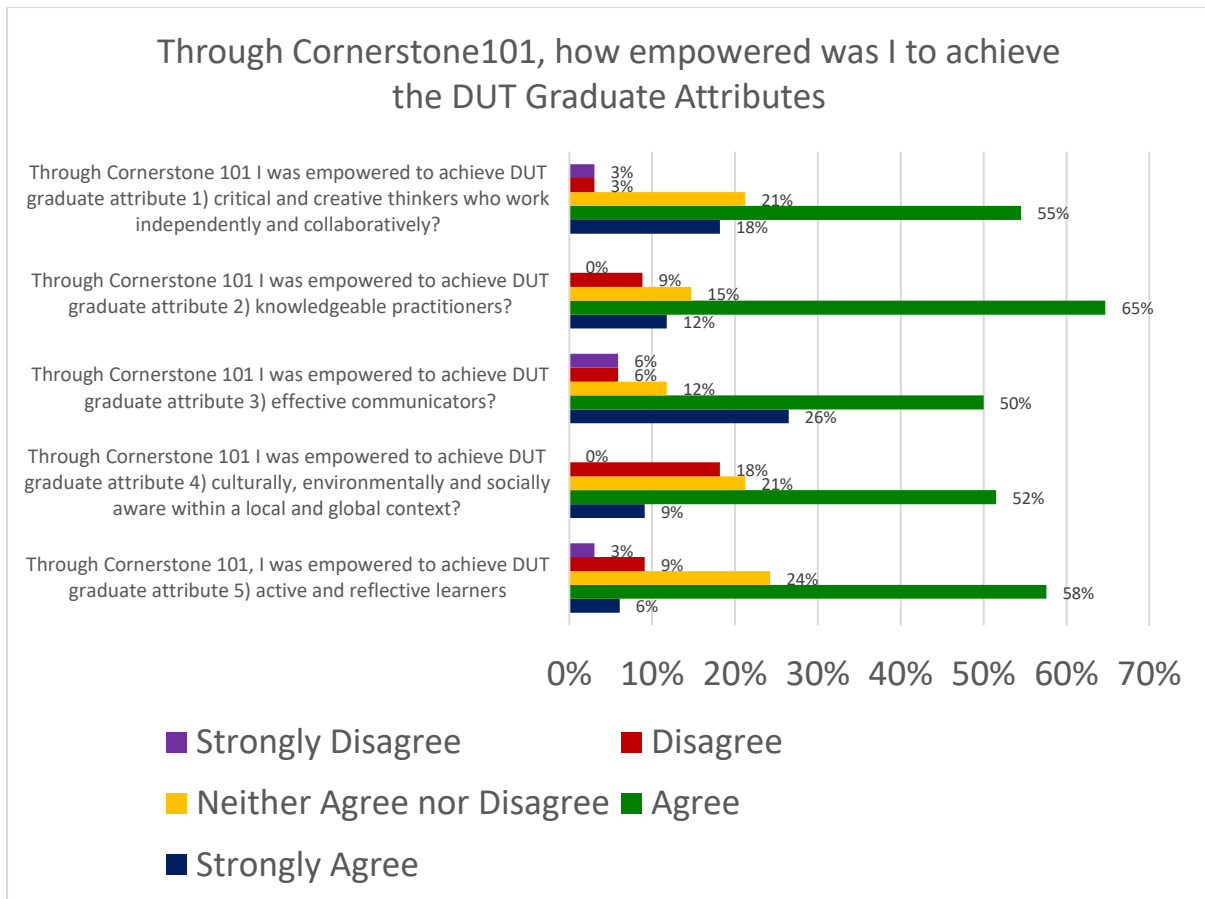


Figure 2 Chart showing the 34 responses to the various questions about how Cornerstone101 empowered them to achieve the DUT Graduate Attributes

In order to obtain the General Education part-time lecturers' and graduate assistants' reflections on how they empowered and enabled students to achieve the DUT Graduate Attributes, a paper survey was conducted with staff. This feedback provides valuable insight between staff opinions and student experiences. Figure 3 shows the lecturer and graduate assistants' responses to whether they incorporated the DUT Graduate Attributes in their classes in the first semester of 2017.

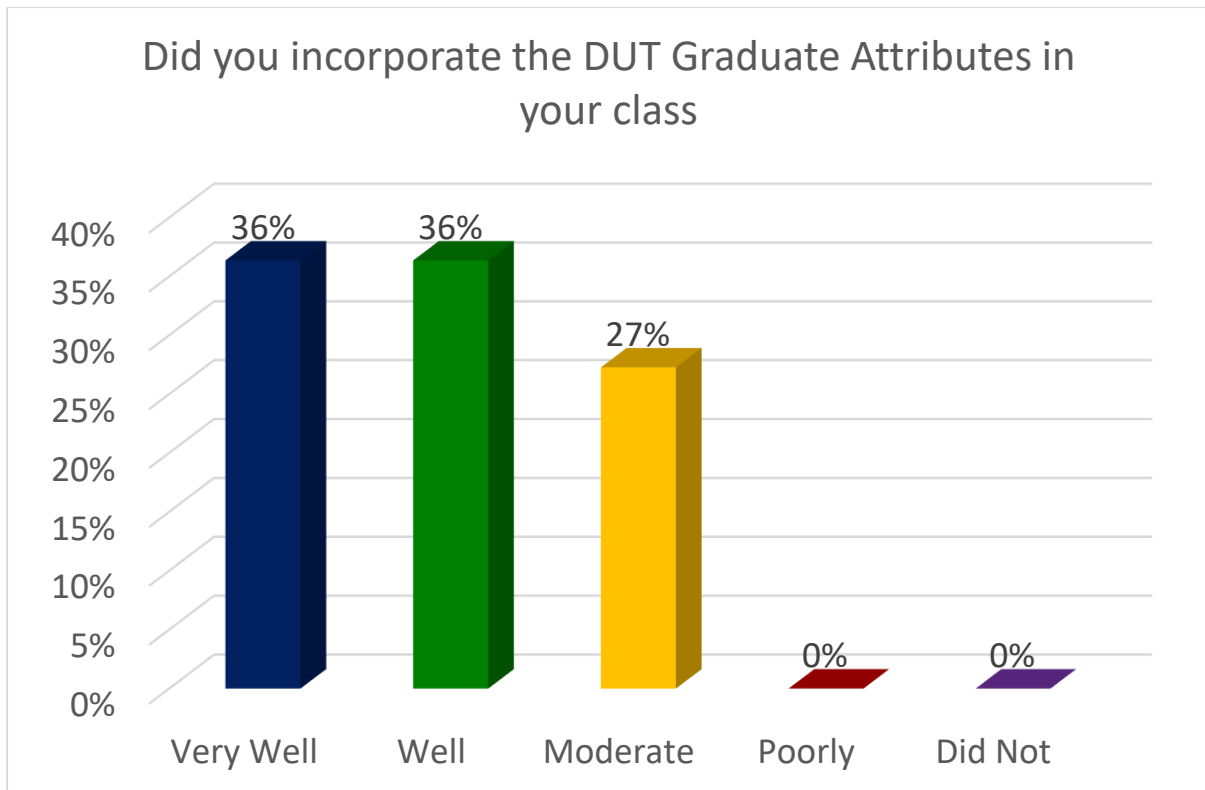


Figure 3 Graph showing the GE lecturer and graduate assistant feedback from Semester 1 2017

Figure 3 shows the results of whether the lecturers and graduate assistants believed they enabled and empowered students to achieve the DUT Graduate Attributes and Figure 5 shows whether the lectures and graduate assistants thought that students achieved the graduate attributes in the IGE modules. General Education staff were most positive about empowering the students to achieve DUT Graduate Attributes 1 and 5. This comes through again in Figure 5 that shows that lecturers and graduate assistants were most positive about students achieving these graduate attributes. This can be attributed to the assessments that comprise individual and group assignments and the CSTN101 weekly reflection exercises.

Staff were more critical about achieving DUT Graduate Attribute 3 and 4. This can be attributed to the “environmentally” aware criteria where CSTN101 does not currently include an environmental component so lecturers were more critical in their reflection in comparison to the students who focussed on the culturally and socially aware criteria of the graduate attribute. This is reflected in Figure 4 where lecturers and graduate assistants were far more critical in students not achieving this graduate attribute. An insight regarding DUT Graduate Attribute 3 (effective communicators) may be that the lecturers and graduate assistants might feel that they need to be more intentional in assisting students to achieve this attribute beyond referring students to the writing centre and having one-on-one student consultations to help the students with their draft assignments.

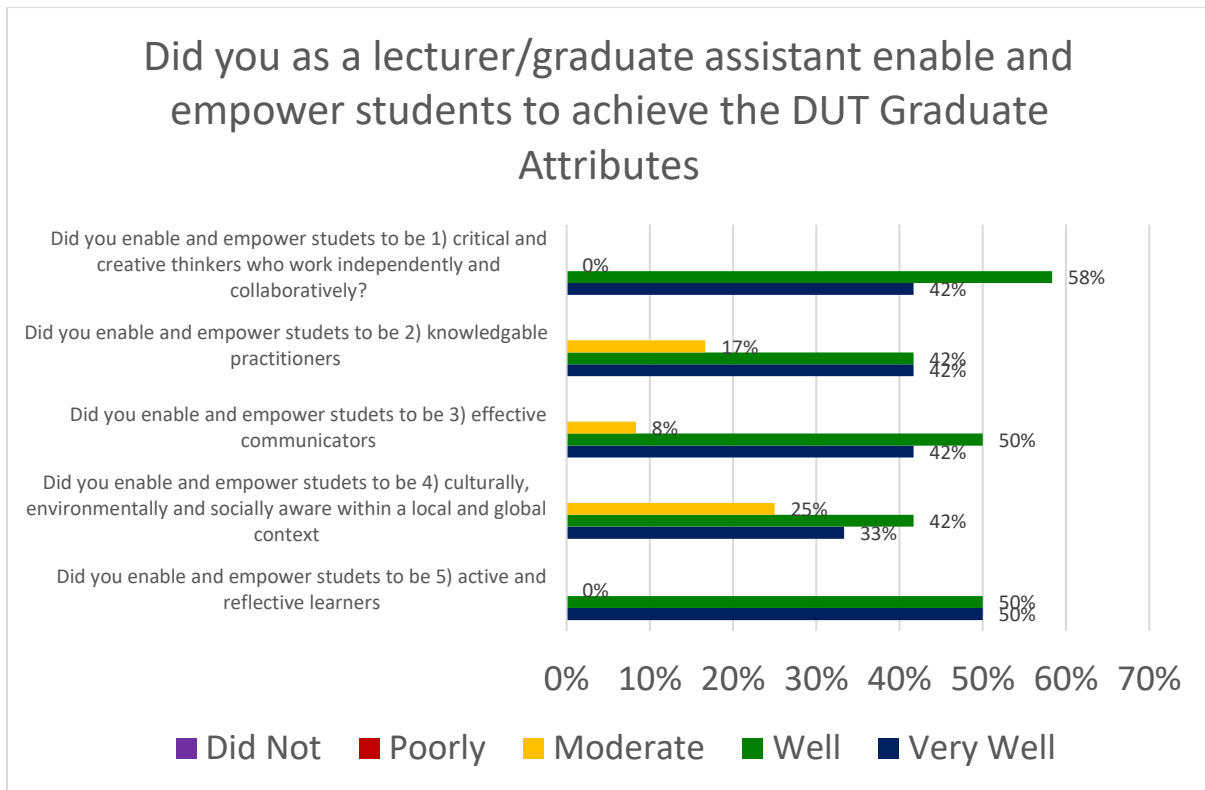


Figure 4 Graph showing Lecturer and Graduate Assistants reflections on how they enabled and empowered students to achieve the DUT Graduate Attribute when lecturing General Education modules in Semester 1 2017

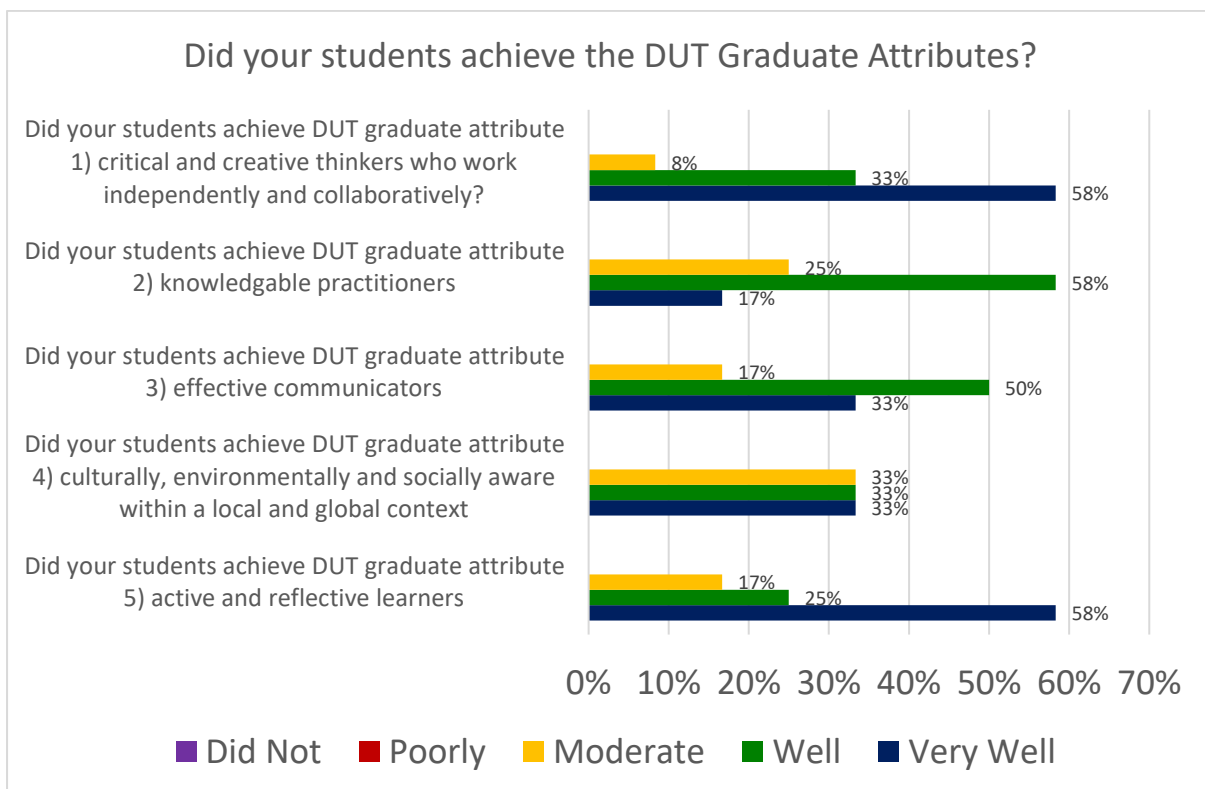


Figure 5 Graph showing the General Education Lecturers and Graduate Assistants reflections on if they thought that their students achieved the DUT Graduate Attributes from Semester 1, 2017

In the comment section, a Graduate Assistant wrote: “Students were learning from each other through the discussion and their prejudices against certain people such as homosexuality were reduced by the end of the semester, which they also highlighted in their reflection.” This highlights the effectiveness of the small group lecture and the use of peer-to-peer discussions to transform a student’s perspective and the effectiveness of reflections in order to enable the transformative learning process.

A graduate assistant who rated themselves lower responded with the following comment: “This semester I should make a conscious effort to present graduate attributes rather than implying them implicitly.” Through reflection the graduate assistant realised that they could be more intentional with their approaches to the graduate attributes. The opinion that the graduate attributes are “implicit” in the student curriculum is shared by DUT staff and was voiced during the mid-term review process for the new curriculum. More needs to be done on an institutional level to make sure that all DUT staff are intentional about the graduate attributes in their classroom practice. An additional question that can be asked in future surveys is how the lecturers rate themselves in leading by example and exhibiting the DUT graduates attributes themselves in the classroom.

The implementation of compulsory small group lecture attendance

Whilst class attendance is common as a prerequisite for the Duly Performed (DP) requirements in other universities, it is not common practice at DUT. In the United States, the focus has been on retention rates and what interventions can be done to improve retention. An example is Odessa College’s four instructional commitments: Interacting with students by name during the first week of a new term; Monitoring student behaviour and progress and intervening when an issue arises; Meeting with students one-on-one and communicating routinely about their course performance; and Becoming a “master of paradox” (i.e., maintaining a structured course while allowing for some flexibility) (Kistner & Henderson 2014). The nature of the small group lecture lends itself to interacting individually with students and knowing them by face, monitoring their behaviour in class and intervening with holistic student support where appropriate and having one-on-one interaction during the small group lecture. These practices are extremely difficult to do in a large group lecture where the student to lecturer ratio is high. Because such value is placed on the benefit of the small group lectures to academic success, it is only appropriate that students receive credit for attending. The attendance mark acts as an added incentive to promote class attendance.

In November 2017 the Siyaphumelela Data Coach facilitated a workshop for Understanding and Improvement using Cornerstone data for DUT staff. The data included small group lecture attendance and overall performance in the module as shown in the surface plot in Figure 6. The vertical axis shows the percentage full time first semester Durban Campus students enrolled per grid cell for 2017 with 2 530 full time first semester Durban Campus students taking the module in 2017. The data shows a clear correlation between the small group lectures attended and their final mark for Cornerstone. This is shown by the single huge mountainous peak which visualises the large number of students who attended more than 8 small group lectures and passed Cornerstone. If the correlation was poor you would expect to see more than one peak or a smoothed hill instead of a mountain.

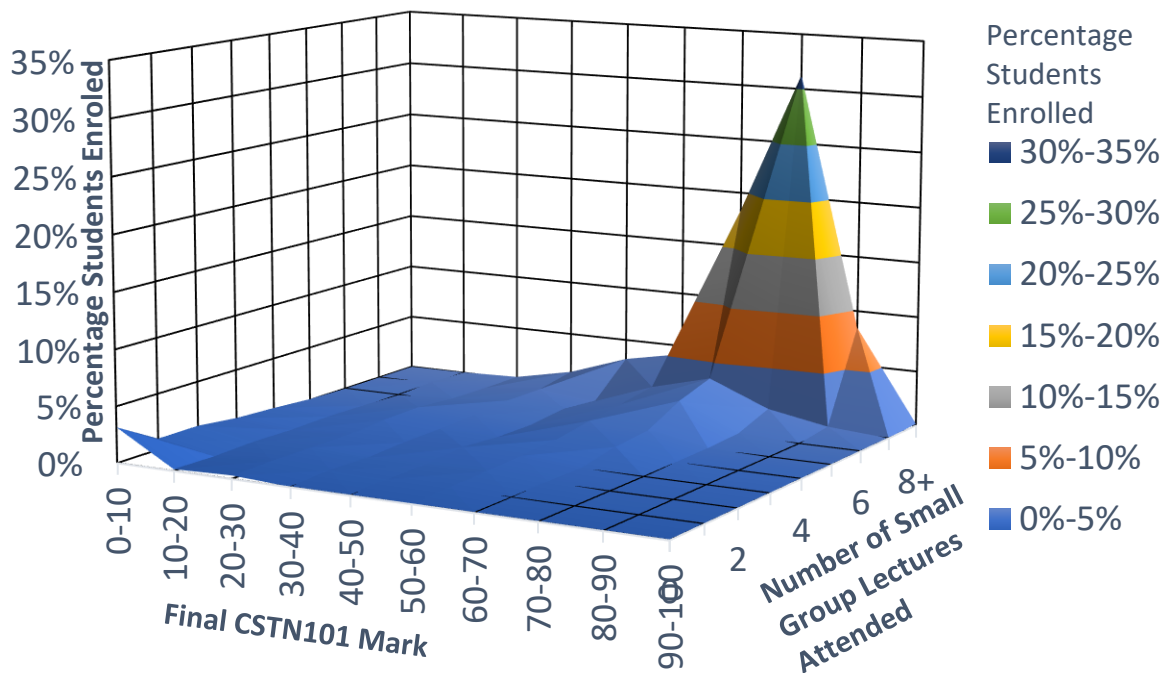


Figure 6 Surface Diagram showing the Cornerstone101 Pass Rates and the Number of Small Group Lectures attended. The vertical axis shows the % students for each category. The surface plot shows the clear correlation between students who attended more than 8 small group lectures and their final marks achieved for Cornerstone.

The preparation for the workshop included looking at data that might predict academic performance in Cornerstone 101. Upon visual inspection, there were poor correlations between the academic performance for Cornerstone 101 and their responses in the Beginning University Survey on Student Engagement (BUSSE), including responses such as first-generation status, high school marks, mother tongue and age. The inspection of the data was done in pivot tables in excel to summarise the BUSSE responses according to Cornerstone performance. If correlations had been found upon visual inspection, then further correlation statistics would've been performed. This means that factors beyond certain student demographics captured in BUSSE are influencing performance in Cornerstone 101. It is unclear if the poor correlation is because of the transformative learning underpinning of Cornerstone module in the delivery and assessment which contrasts with traditional content driven subjects that students took in high school. Further analysis of predictive indicators showed that students who were attending Cornerstone small group lectures performed better in Environmental Sustainability in 2017, which at the time did not capture small group lecture attendance. The most likely reason for this was that the students were on campus attending class for their other modules in addition to their Cornerstone small group lectures.

In 2018, other IGE modules followed the Cornerstone approach and included small group lecture attendance in the final mark because of the correlation between small group lecture attendance and academic performance. One of these modules was Environmental Sustainability that implemented compulsory small group lecture attendance in the first semester 2018. The results are shown in Figure 7. The vertical axis shows the percentage full time first semester Durban Campus students enrolled per grid cell for 2018 with 985 full time first semester Durban Campus students taking the Environmental Sustainability in 2018. The data show a clear correlation between the small group lectures attended and their final mark for Environmental Sustainability. This is shown by the single

huge mountainous peak which visualises the large number of students who attended the required amount of small group lectures (denotated with a 100%) and passed Environmental Sustainability. If the correlation was poor you would expect to see more than one peak or a smoothed hill instead of a mountain. Out of 798 students who attended the required number of small group lectures, only five students failed the module. The surface plot mirrors that of Cornerstone the previous year as shown in Figure 6 above.

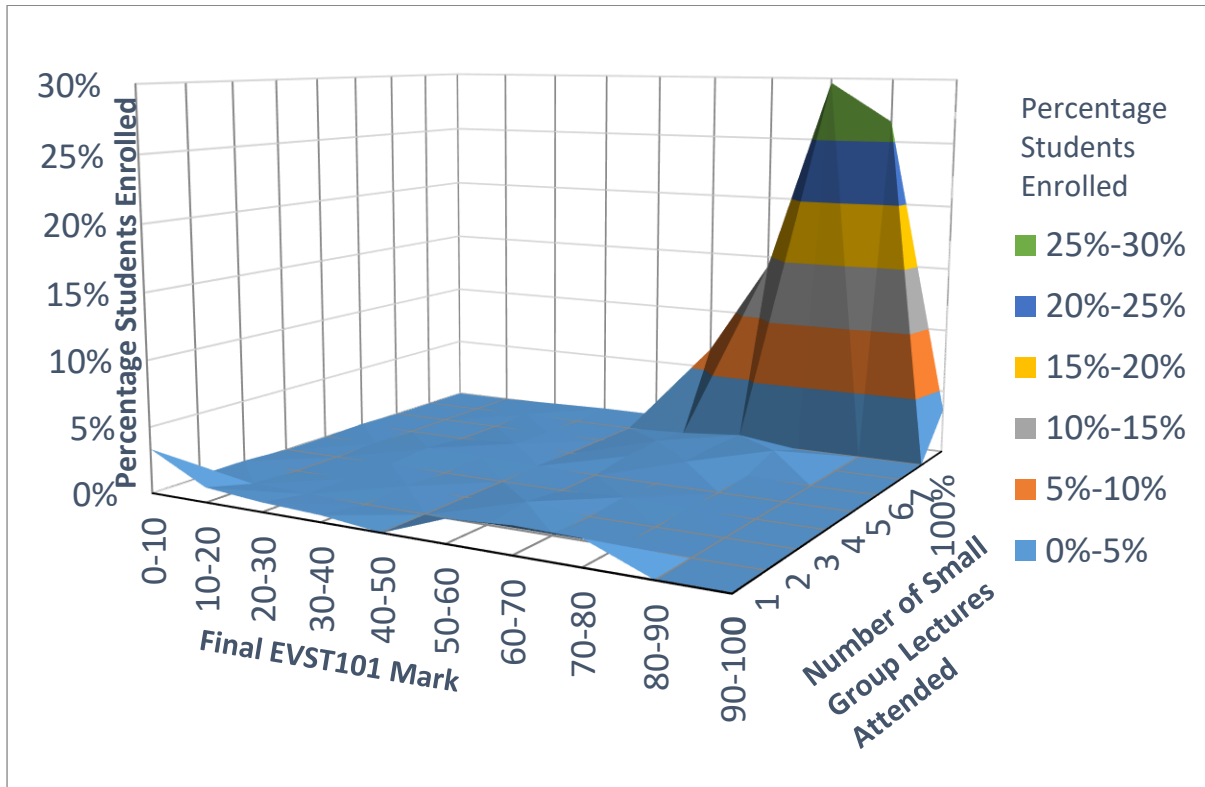


Figure 7 Surface Diagram showing the Environmental Sustainability (EVST101) Pass Rates and the Number of Small Group Lectures attended. The vertical axis shows the % students for each category. The surface plot shows the clear correlation between students who attended more than 80% of small group lectures and their final mark achieved for Environmental Sustainability.

The Centre for General Education is able to successfully monitor and track student attendance and performance in its modules despite its large enrolment numbers, which leads the way for other departments to implement this promising practice if they have the will, passion and data management capacity. Some departments in other faculties have already adopted this compulsory attendance practice in their tutorials or practical sessions in order to boost class attendance and, subsequently, student success.

The use of technology to closely monitor student success

Closely monitoring student success is one of Odessa's Four Instructional Commitments (Kistner & Henderson 2014). The quick uploading of marks is essential towards students knowing their progress and ultimate success. In addition, it is essential towards lecturers knowing how their students are performing and responding appropriately before their students fail. This is not the common practice at DUT with secretaries often delegated to capture the marks manually. The Centre for General Education, because of the extremely large enrolment numbers in the IGEMs and the comparative lack of administrative support, managed to use the existing functionality to bulk upload student marks to ITS.

This is now the accepted practice, and all student marks are bulk uploaded to ITS as they become available. This technological solution has changed lag measures to lead measures. It allows students to see their continuous assessment marks as they become available rather than waiting for the end of the semester. It also allows lecturers to track student performance and intervene before they fail. In addition, it allows students to identify errors in the capturing of their marks and rectify these before the marks are signed off. Furthermore, students who failed individual assignments and do not attend class are able to check the student portal for their marks and come to the department in order to repeat with a maximum mark of 50% for the failed assignment as part of the continuous assessment policy.

Building on this, the Centre for General Education receives a printout of repeat students in all of the modules. These students are automatically flagged as potential high-risk students and their attendance in class and performance in assessments is closely monitored. This is easily done through an Excel database. The repeat students are indicated with a special code on the registers so that lecturers and graduate assistants are aware and able to monitor the student's attendance and academic performance.

As part of the Siyaphumelela data capacity training, the General Education datajedi ran intermediate Excel workshops to train other DUT staff to bulk upload their student marks to ITS. The intermediate data training workshop included the use of pivot tables to extract tables needed for the examiner's report for each module. As the enrolment numbers increase and resources decrease, data analytics capacity is essential to capture, monitor and analyse student performance data. Technology has greatly improved and made more efficient the data management for the department and has provided opportunities for sharing of promising and good practice.

The reflective culture amongst General Education staff, in line with the active and reflective learner graduate attribute

Reflect-in-Action culture

Active and reflective learners is DUT Graduate Attribute 5, and reflection is a key mechanism of transformative learning as discussed previously. Lecturers need to be actively reflecting in class and outside of class. Typically, the reflection takes place as a reflect-in-action activity. Schön (1991) describes Reflect-in-Action as "We think critically about the thinking that got us into this fix or this opportunity; and we may in the process, restructure strategies of action, understanding of phenomena, or ways of framing problems... Reflections gives rise to on-the-spot experiment". The use of on-the-spot experiment conjures the image of a mad scientist in the laboratory, but the sentiment of Schön is that it is on-the-spot interventions. An example of a reflect-in-action exercise is shown in Figure 8 where General Education staff were asked to reflect on "What do you now know that you wish you had known at the start of the semester". The sharing of the reflections allowed other lecturers to quickly learn from their colleagues and immediately implement interventions.



Figure 8 Reflect-in-Action exercise: Things I know today that I wish I knew at the start of the semester from Semester 2 2017

Reflect-on-Action culture

A workshop was held at the end of 2018 in order to reflect on four years of General Education at DUT. This provided the rare opportunity to reflect-on-action at the end of a four-year implementation period. DUT staff who had been involved in the General Education project were asked to reflect on what success means to them personally. The results are summarised in Figure 9. Most strikingly, the staff did not define success according to academic performance of their students and yet this is the measure that is used when discussing student success at the University. This illustrates the holistic approach to education that is part of the founding principles of general education and shows the potential that general education has in not only transforming students' lives but transforming staff culture too.

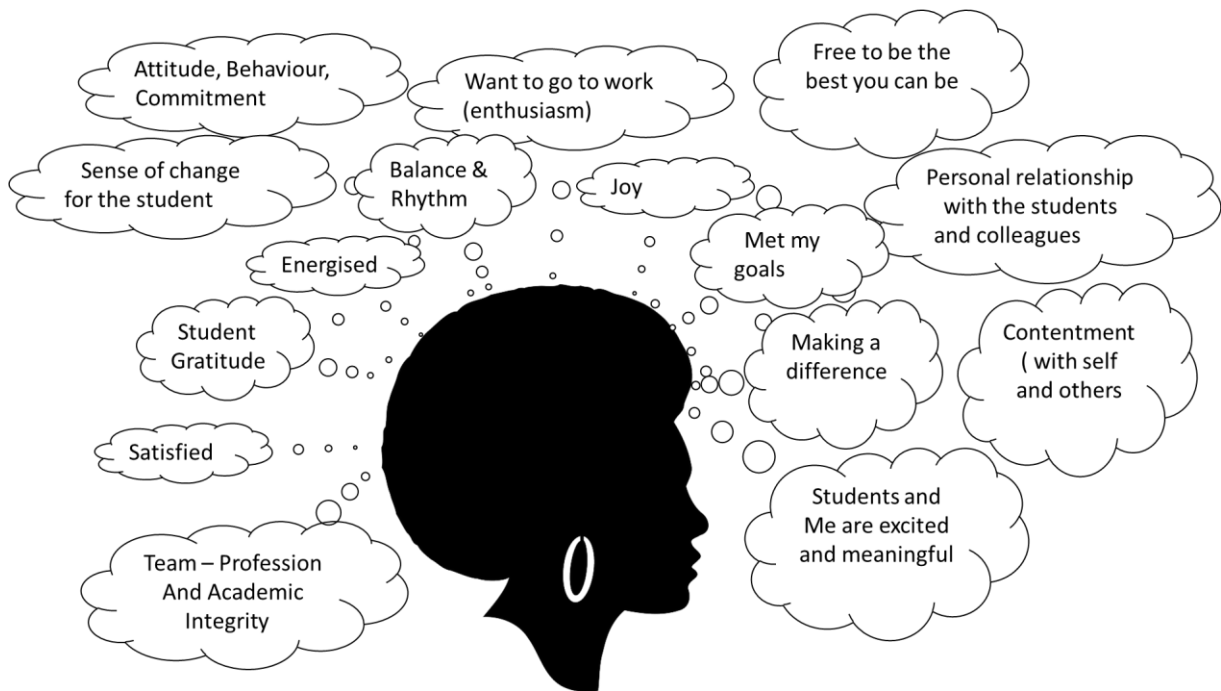


Figure 9 Summary of staff reflections on what success means to them.

Staff also reflected (as shown in Figure 10) on the following:

- Students succeed when staff at DUT do the following...;
- To be a successful student at DUT I need to do...;
- Students are successful in Higher Education when...;
- To assist students to succeed at DUT, as a staff member I should be; and
- Students are successful at DUT when...

The feedback from staff again shows the holistic approach to student success. This was done in a “gallery walk” workshop where staff had to use Post-it to stick their responses to the posters, whilst be able to browse the gallery and see what other staff members had written. In addition, they could engage with staff about their choice of response during the gallery walk. After the gallery walk, staff discussed and reflected on the insights provided through the exercise. These reflection exercises proved so insightful that they were run at a Siyaphumelela Student Success Task Team as part of a reflect-in-action workshop to reflect on 2018 and to look forward to 2019.

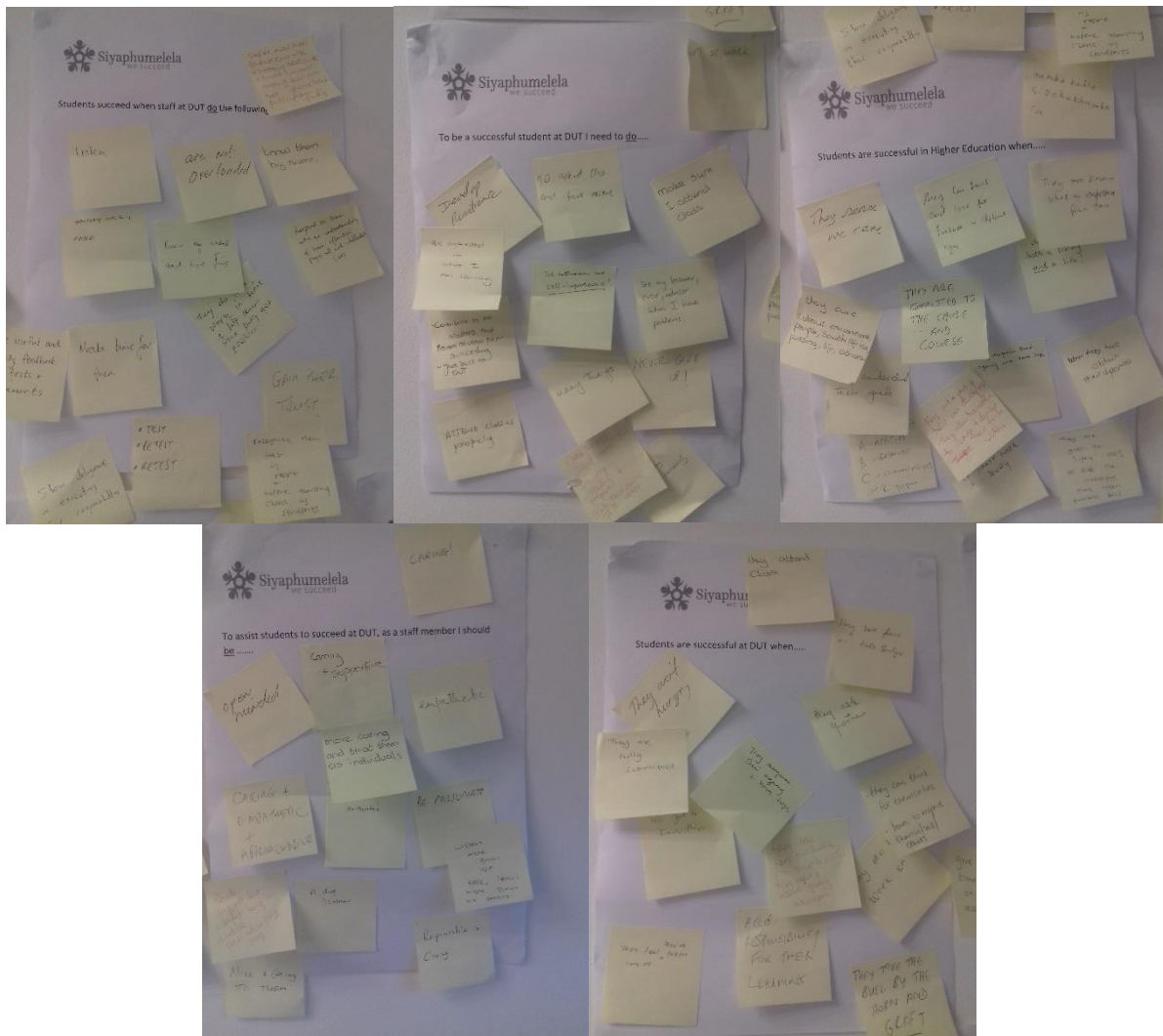


Figure 10 Reflections after 4 years of General Education at DUT clockwise from the top left: Students succeed when staff at DUT do the following...; To be a successful student at DUT I need to do...; Students are successful in Higher Education when...; To assist students to succeed at DUT, as a staff member I should be ...; and Students are successful at DUT when...

Comparison of General Education lecturers to other DUT lecturers

DUT participated in the Lecturers Survey on Student Engagement (LSSE) in 2018. Five General Education lecturers completed the survey out of 45 DUT staff. The responses of the General Education staff were compared to the other faculty staff. Figure 11 shows that General Education staff provide feedback on drafts or work in progress “very much” in comparison to other faculty staff. The promising practice of a student-centred culture means that the General Education lecturers focus on the student and work with their draft assignments for them to have a better mark when they submit their final assignment.

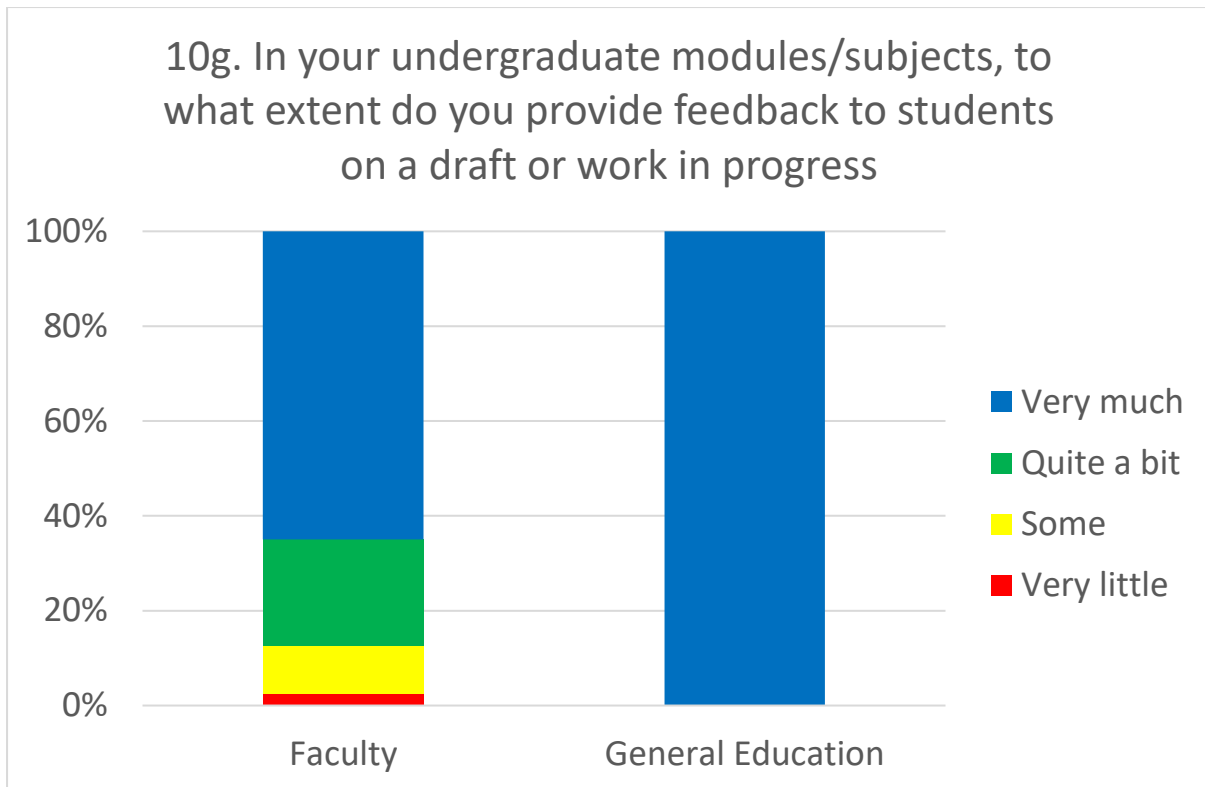


Figure 11 Graph showing the General Education staff responses to providing feedback to students on a draft or work in progress compared to other DUT faculty staff.

The classroom practice of asking questions and having discussions is reinforced by all the general education staff replying “very important” to Question 22a (“In your selected module/subject, how important is it to you that the typical student asks questions or contribute to module/subject discussions in other ways?”. In contrast 82% of DUT Staff from other faculties replied “very important” to the same question. It is significant that the response from general education staff was unanimous since this means that these staff intentionally plan and deliver their modules to encourage student engagement in various ways.

Table 3 shows the very different viewpoints between what General Education staff expect from their students, and the expectations of other DUT faculty staff of their students. The questions in the table speak to the graduate attributes and how General Education staff expect students to achieve these within their modules, in comparison to other faculty staff who may feel that the graduate attributes are “implicit” within the curriculum. The questions also speak to Transformative Learning Theory. The revision of belief system and changes in behaviour comes through strongly in the expectations of the General Education lecturers. DUT faculty lecturers have an expectation that students should combine ideas from other modules when completing assignments whilst the General Education staff expect students to draw on their and other peoples lived experiences. A future improvement for the General Education lecturers would be to intentionally incorporate the programme and students’ core modules in their General Education lecture for students to better understand the applicability of what they are learning in their future professions.

In addition, Table 4 shows the value General Education lecturers place on diversity and intentionally creating opportunities for students to engage and discuss with other students from backgrounds different to their own, in comparison to the other DUT faculty lecturers. In the small group lectures in

IGEM, these discussions are facilitated by the lecturer and students are encouraged to share and engage with viewpoints other than their own. Cornerstone encourages students to engage with each other on various topics during their small group lectures. The Community Engagement Project module specifically states that the learning outcome is that students in a diverse group plan, implement and evaluate a community engagement project. In order to ensure that the groups are diverse, some IGEMs take the approach of separating students based on their diversity and skills, and then create groups containing a member from each diversity, rather than allocating groups based on student number or surname or even worse, allowing them to form their own groups and work with their friends.

An example would be to separate the class into the following groups: those who are good at speaking loudly (good communicators), those who are good at Microsoft office (IT literate and usually a different economic background), those who do volunteering work (socially responsible), those who are not from KwaZulu-Natal (different culture) and those who can speak more than one language (students often do not realise that speaking more than one language is a skill and this empowers them to be proud of their linguistic skills). Gender and race balance are also considered to ensure diversity. Students respond very favourably to this approach as they can see the value in diversity and working with people with a skill set different to their own.

An additional exercise to make students aware of diversity is the “stand up if” which requires students to stand up if the statement is true for them. This exercise was repeated during the Gen Ed staff induction in 2019. Examples of statements include: stand up if you can speak more than one language; stand up if you are the first person from your family to attend university; stand up if you were born in South Africa; Stand up if your mother was or is a domestic worker; stand up if you are an only child. This is an excellent interactive exercise to make students and staff aware of the diversity around them.

Boyer (1990) states that great teachers “stimulate active, not passive, learning and encourage students to be critical, creative thinkers, with the capacity to go on learning after their college days are over.” The reflective practices of staff improve their scholarship of teaching, and there is a focus on the transfer of teaching pedagogy from experienced teachers to less experienced graduates. Boyer (1990) goes on to state that good teaching means they are also learners. Lecturers must be lifelong learners in order to be good teachers and the reflective culture and reflective criteria in the modules requires that staff themselves become reflective learners.

Table 3 showing the General Education staff compared to the other DUT faculty staff in response to question 23. In your selected module/subject how important is it to you that the typical student does the following?

Question 23. In your selected module/subject, how important is it to you that the typical student does the following?	General Education or Faculty staff	Not important	Somewhat important	Important	Very important	Total
Combine ideas from different modules/subjects when completing assignments	Faculty	1	2	18	19	40
	General Education		2	1	2	5
Connect his or her learning to societal problems or issues	Faculty		6	12	22	40
	General Education				5	5
Include diverse perspectives (political, religious, racial/ethnic, gender, economic, etc.) in module/subject discussions or writing assignments	Faculty	5	6	9	20	40
	General Education			1	4	5
Examine the strengths and weaknesses of his or her own views on a topic or issue	Faculty	16	1	4	17	38
	General Education				5	5
Try to better understand someone else's views by imagining how an issue looks from his or her point of view	Faculty	1	6	11	21	39
	General Education				5	5
Learn something that changes the way he or she understands an issue or concept	Faculty	15	1	1	23	40
	General Education				5	5
Connect ideas from your modules/subjects to his or her prior experiences and knowledge	Faculty		4	13	22	39
	General Education				5	5

Table 4 showing the General Education staff compared to the other DUT faculty staff in response to question 26. In your selected module/subject, how much opportunity do students have to engage in discussions with people from the following groups?

Question 26. In your selected module/subject, how much opportunity do students have to engage in discussions with people from the following groups?	Faculty or General Education Staff	Very Little	Some	Quite a bit	Very much	Grand Total
People of a race or ethnicity other than their own	Faculty	7	9	12	11	39
	General Education			1	4	5
People from an economic background other than their own	Faculty	7	10	11	10	38
	General Education			1	4	5
People with religious beliefs other than their own	Faculty	6	8	13	11	38
	General Education		1		3	4
People with political views other than their own	Faculty	4	15	7	11	37
	General Education				4	4

Lessons Learned

Despite the challenges, the General Education has provided many promising practices that have started to transition DUT from a rigid discipline content curriculum to a flexible curriculum where students take control of their own education. The use of technology in the management of the classroom registers and mark capturing has resulted in staff and students being able to track and monitor student performance and intervene before they fail. The implementation of 10% small group lecture attendance has a positive effect on student performance and this practice is being taken up by other modules at DUT. Lastly, the reflective culture within the Centre, in line with the active and reflective learner graduate attribute, has generated several workshop activities that have been repeated at Siyaphumelela Student Success Task Team workshops.

The lessons learned are summarised according to the 4 focus statements.

1. Student success and graduate attributes to measure student success;

The focus on student success and graduate attributes has proved beneficial to both General Education staff and students. Student success is more than just academic performance. Graduate Attributes need to be explicit in the curriculum and used frequently by lecturers. Graduate Attributes can also be instrumental in getting students to “buy in” to engaging with a module when it is not part of the core curriculum because the focus is on the skills that they will develop that will give them the competitive edge in the workplace. We believe that the approach followed in the General Education modules is a promising practice that can be built upon further and adopted by other academic departments in their programme delivery.

2. The implementation of compulsory small group lecture attendance;

Students need to be in class in order to engage with the module. Small group lectures of 25-35 are most effective to allow for individual attention from the lecturer. This case study has highlighted the correlation between small group lecture attendance and academic performance. In addition, the use of peer-to-peer discussions in the small group lectures to transform a student’s perspective and the effectiveness of repeated reflective practice enable the transformative learning process.

3. The use of technology to closely monitor student success; and

Monitoring student success is key to intervening and assisting the at-risk students before they fail. Technology can assist with the management of large enrolment numbers and the capturing of student marks. Technology can also assist where resources are scarce, and lecturers and administrators need to be efficient with their time. For DUT, this promising practice is critical to the effective implementation of student tracking systems and predictive analytics. If the data is not available timeously, lead measures that can be tracked through such systems, become lag measures. The student who should be the ultimate beneficiary, loses any potential benefit.

4. The reflective culture amongst General Education staff, in line with the active and reflective learner graduate attribute.

Reflection is essential to improving. Reflecting is done with the aim of improving practice. This resonates with the University’s Strategic Focus Area 3 of “Building a learning organisation” through which continual spirals of learning and improvement lead us towards better practice. In this case, classroom practice and organisation, academic administration assisted through technology, and staff who continually reflect to understand and improve. Thus, staff become effective role models for our students to develop active and reflective life-long learning behaviours.

In general, the implementation of General Education has allowed some students flexibility in their elective choices. Instead of students repeating modules until they pass in the fixed curriculum structure, students can now choose to take a different elective general education module and we are now starting to see students making this choice. In

order to maximise the flexibility, students need to be made aware of the module content at the time of registering so that they can make informed choices when selecting elective modules.

Lastly the focus on teaching practice allows lecturers to improve their scholarship of teaching and provides an opportunity for graduates who are interested in pursuing a career in academia to explore the option for themselves through the part time appointment and exposes them to career opportunities in higher education. Great teachers aren't born, they are forged in fire, and the General Education modules provide even experienced lecturers the opportunity to improve their scholarship of teaching.

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