

RESEARCH ARTICLE

Effective Institutional Intervention Where It Makes the Biggest Difference to Student Success: The University of Johannesburg (UJ) Integrated Student Success Initiative (ISSI)

André van Zyl,^{*} Graham Dampier^{**} & Nkosini Ngwenya^{***}

Abstract

Low levels of student success in South Africa have persisted as a seemingly intractable problem. There have been some gains in student success over time, but with a participation rate of approximately 18%, the current success rates still represent massive financial and human losses to the country. Internationally there is a trend to move towards interventions that are more strongly data-informed at every step and the available evidence indicates that these interventions are more likely to have the desired effect. This article reports back on the first 24 months of implementation of one such intervention, namely the Integrated Student Success Initiative (ISSI), at the University of Johannesburg (UJ). The ISSI uses data to inform every step of the process which includes planning, selection and targeted intervention and evaluating possible impacts. The ISSI is showing promise as an effective strategy for improving student success and is allowing the institution to focus its limited resources where they have the potential to make the biggest difference.

Keywords

collaboration; data informed interventions; integrated initiatives; student success

Introduction

In South Africa (SA), student success in higher education is a matter of national debate and concern. This is mainly due to persistently low success and throughput rates. Enrolment figures in higher education institutions (HEIs) have remained on a steady upward trajectory since 1994, yet success and throughput rates have been relatively low when contrasted with the number of students enrolled for each particular cohort (Moodley & Singh, 2015; Mkonto, 2018; Murray, 2014). The South African Higher Education system has more than doubled in size from the 495 356 students registered at the advent of democracy in 1994 (Department of Higher Education and Training [DHET], 2012) to just over 1 million registrations in 2019 (Essack, 2012, p. 49; DHET, 2019b). Student success has, however, not

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shown similar improvements. As the Council on Higher Education (CHE) puts it: "... the system has not yet come to terms with the learning needs of the majority of the student body" (CHE, 2013, p. 4).

Universities have also found it challenging to develop the necessary support and intervention strategies to support student success (UNESCO, 2017). This misalignment manifests itself in the high drop-out rates, low success rates and sluggish throughput rates that characterise the sector (DHET, 2019b). Although there have been recent improvements in the main metrics used to measure the effectiveness of the South African tertiary system (DHET, 2019a), the fact remains that with a participation rate of between 17% and 18%, of the top-performing school-leaving students, approximately 30% to 40% of entrants leave the system without graduating (DHET, 2019a). The South African system has been called a low participation, high attrition system (Fisher & Scott, 2011), which translates into high levels of human and financial wastage.

Even though higher education systems generally face similar struggles, this wasteful situation is especially problematic in the South African context. The higher education sector in South Africa plays a crucial role in facilitating upward social mobility as well as in raising the economic activity of the nation (Maluleke, 2018). These important goals are, however, threatened by inferior success rates of first-generation, low-income students who make up a large proportion of students who do not persist for longer than the first semester of their first year (Essack, 2012).

For this reason, it is understandable that South African universities have come under increasing pressure to address the high failure and drop-out rates (Manik, 2015). As a result of the country's recent historic developments, many first-generation, or non-traditional students, have entered into the higher education system. These first-generation students often enter the university underprepared for the challenges they will face and as a result struggle to adapt to university life and its demands; and they are more likely to withdraw from higher education without completing their qualifications (Escobedo, 2007). In addition to this, higher education institutions across the country have struggled to cope with "the students they have" and in many ways remain under-prepared for the students they enrol (CHE, 2013). It is evident that universities need to design intervention strategies that mitigate the high drop-out and failure rates. Tinto (2014, p. 6) argues that without academic, social and financial support "many students do not complete their programmes of study". "It is my view," he continues, "that once an institution admits a student, it becomes obligated to provide, as best it can, the support needed to translate the opportunity access provides to success" (Tinto 2014, p. 6). This challenges South African universities to implement effective intervention strategies to improve student success rates.

In many instances, student-success initiatives have been based on the background knowledge and preferences of the staff who design and implement them. As Crisp et al. (2019) point out, institutions (and the staff teaching in them) often make incorrect assumptions about their students when designing their interactions with them. After interventions were completed, it has often been left up to anecdotal evidence to evaluate whether any particular intervention had worked. This basically ad-hoc approach to student

success has shown itself to not be sustainable or systemically effective. This article argues for a much more rigorous process to guide student success work which is data-informed at every step.

Data-informed intervention initiatives have become popular in institutions of higher learning since the early 2000s (Van Vuuren, 2020, p. 137). For example, predictive modelling initiatives such as the Konstanz Information Miner (KNIME) used at the Cape Peninsula University of Technology (CPUT) allows the institution to “recognise students with a high probability of dropping out by the second year of study” (Lourens & Bleazard, 2016, p. 129). Another similar initiative is the State Action for Education Leadership Project II (SAELP II) developed by the Ohio State University. This initiative has allowed higher education institutions to “analyze the educational needs of students who are not showing adequate progress” by manipulating and analysing data to track these students (Cooley, Shen & Miller, 2006, p. 59). Educators are better placed to respond effectively to the needs of students and to improve success and throughput rates than ever before.

Pathway to Success (PWAY) at the Louisiana State University is another data-informed student success intervention that relies on academic, non-academic, and personal attribute data to tailor institutional interventions for each student (Fowler & Boylan, 2010, p. 2). The PWAY intervention approach goes beyond merely addressing academic challenges to incorporating non-academic and personal challenges as well. The retention rate (i.e. the percentage of students from the original cohort who persist with their studies from first year to second year) of first-time entering first-generation students at the Louisiana State University increased from 29% to 52% in 2009 following its initial implementation at the institution (Fowler & Boylan, 2010, p. 8).

Another academic intervention programme that has reported positive results is the so-called “Affirmation intervention,” which has been credited with improving the success rates of minority students at Stanford University (Dee, 2015, p. 149). This intervention is centred on self-affirmation exercises that students undertake, which encourages them to identify and reflect upon their core personal values. The findings of the study showed that at-risk students, who underwent self-affirmation exercises, credited these interventions with motivating them to excel academically and with inculcating positive attitudes to learning (Dee, 2015, p. 150). Thus, data-informed interventions appear to be achieving promising results. They seem to be relatively effective at identifying student success challenges and addressing these through tailored interventions.

The student success problems in the South African system have proven very difficult to address effectively and often well-intentioned initiatives have proven to be expensive and relatively ineffective. To address the complicated set of factors that contribute to high levels of drop-out and low success rates, data-informed intervention programmes are necessary. It is therefore imperative that data is effectively used in at-risk student identification, intervention design, and evaluation. Such a data-informed approach holds the promise of facilitating the implementation of effective interventions as well as the creation of enabling structures and systems that eliminate learning challenges. The evidence seems clear that underperforming subgroups of students have been shown to stand a better chance of

excelling academically if well-planned and effective interventions are put in place as recommended by Appel and Kronberger (2012) and Aronson, Fried and Good (2000).

As Tinto (2014, p. 21) stated during his visit to South Africa: “Effective student support does not arise by chance. It is not solely the result of good intentions. Rather it requires the development of an intentional, structured, proactive approach that is coherent, systematic and coordinated in nature.”

The University of Johannesburg (UJ) has built up a good reputation for its innovative efforts at improving student success. Some UJ initiatives have included the UJ First-Year Experience (FYE since 2010) and the UJ Senior Student Experience (SSE since 2015). The institution has taken substantial steps to improve student success, which have resulted in notable gains. The module credit success rates improved by more than 10% over the past eight years, and currently fluctuate between 85% and 86%. Feedback has also indicated that students are continuously reporting positive perceptions of their experience of their tuition and the support they receive at UJ.

Other institutional data have been more worrying. These included the indications that only approximately 37% of UJ students from the 2012 entering cohort completed their qualifications in minimum time (M); which increased to roughly 55% of the same group in minimum time plus one year (M+1). These figures illustrate that the high module credit success rate does necessarily translate into high minimum time completion rates. The Integrated Student Success Initiative (ISSI) at UJ, which is the subject of this article, represents a new data-informed intervention strategy, aimed at addressing this problem, that has shown real promise.

UJ Context

The data-informed approach used in the ISSI starts with investigating the underlying attributes that students arrive on campus with. The UJ student population has been studied in some detail since 2007 using the Student Profile Questionnaire (SPQ). Data generated by SPQ has been collected during the annual orientation (also referred to as the First Year Seminar) since 2007. In all, the total dataset contains 57 934 student records collected over the 14 years across all UJ faculties and campuses. The SPQ dataset has shown that the majority of UJ students are non-traditional university entrants, who hail from circumstances that tend to make academic success at university less likely than would otherwise be the case (Azmitia et al., 2018).

UJ students have consistently indicated that the majority of them (between 55% and 65% since 2013) are worried that a lack of money will be the cause of them not completing their qualifications. The expansion of the National Student Financial Aid System (NSFAS) since 2019 did result in an improvement in these figures, but only by about 5%. This, in turn, links to dropping out for financial reasons as well as very pressing problems such as a lack of food. These worries and their implications negatively influence student success.

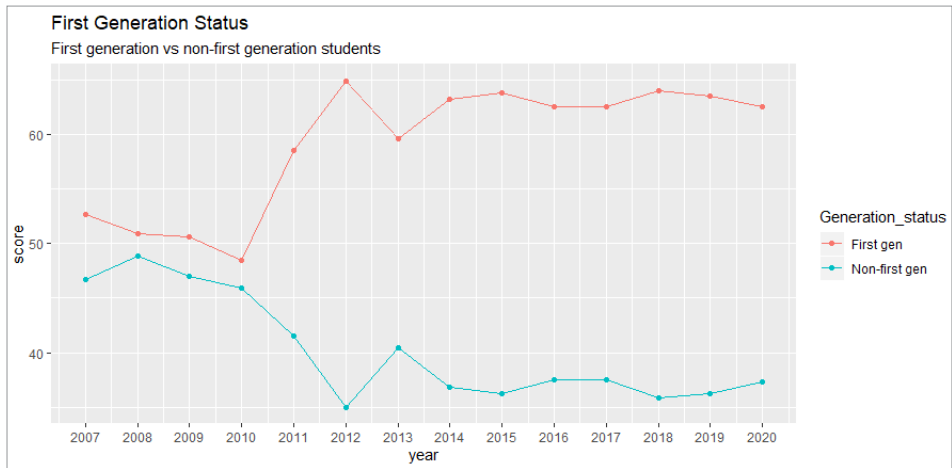


Figure 1: First generation vs non-first generation students

A second factor that has emerged is that more than 60% of newly enrolled UJ students over the past 9 years have indicated that they are part of the first generation in their families to enter higher education (first-generation students). These students often lack family support and the cultural capital needed to succeed at university.

In addition to being worried about money and being part of the first generation of their families to enter higher education, students also reported poor study habits with about 38% of students having spent 10 or fewer hours per week on academic work during grade 12. This is concerning in that if these poor study habits are maintained after arriving at UJ they contribute to academic struggles.

Lastly, many newly entering UJ students have an English literacy background that does not adequately prepare them for the rigours of university study. The only language of instruction at UJ is English, but the majority of students who enrol at the institution are not first-language English speakers. The number of students who are non-first-language English speakers has increased consistently since 2016. In 2020, 75% of students indicated that English is their second, third or fourth language.

It is clear that the “average” student at UJ is a non-traditional university entrant. The majority of new entrants are first-generation students, non-first-language English speakers, who typically did not study very hard at school and are worried that a lack of money will affect their ability to complete their studies negatively. With more than 40 000 undergraduate students, it is often difficult to know where to best intervene to improve and optimise student success in a situation where the institution must teach such a large contingent of non-traditional students, while making use of its limited resources as effectively as possible.

The Decision of Where to Intervene

The second way data are used, is to decide where to intervene. Institutionally, it made most sense to intervene at the level of the modules, as reaching every individual undergraduate student was practically impossible. The main question was how the modules to include in a systematic set of interventions could best be selected. In the past, the majority of module-level student success work was done with lecturers who volunteered to participate, but this often led to the non-optimal use of resources and it also meant that modules where assistance was needed most, often did not receive enough attention. Another approach that has been tried was to focus on modules with the lowest pass rates. This, however, caused a lot of resistance and negativity which, in turn, hindered interventions and their effectiveness.

To counteract these problems in a data-informed manner, the decision was taken to rather identify modules where the greatest number of students could be assisted. The focused ISSI efforts and resources would then be used where they had the potential to make the biggest difference. The concern was with optimising the potential efficacy of the intervention for both the students, who were enrolled in the modules, and for the institution that wants to maximise module credit success. This approach resulted in the selection of modules that made both human and financial sense, which meant that it was easier to motivate both Faculties and Academics to participate in the ISSI.

To enable the selection of the modules where the greatest possible difference could be made, the ISSI implementation process uses the Priority Module Index (PMI, explained below) to identify the 20% of modules across the university where the greatest number of module credits were lost during the preceding year's corresponding semester (semester 1 of 2018 results are used to identify the 2019 Semester 1 Priority Modules). The first step of the PMI analysis produced an institutional PMI list. Because of the size bias in the PMI formula and the massive variations in Faculty sizes at UJ, it was decided to not intervene only in the institutional-level top-priority modules as this would have facilitated interventions in a small proportion of the 8 UJ Faculties (the ones with the largest groups). In a second step, the UJ list was therefore then disaggregated into Faculty lists from which the 45 participating modules in any particular semester (10 for the College of Business and Economics and 5 per Faculty for the remaining 7 Faculties) are identified for ISSI intervention.

The formula used to create the Priority Module Index is based on the Pareto Principle, which is alternatively referred to as the 80-20 rule or the trivial many and the vital few (Boslaugh, 2012). The principle is not a hard-and-fast rule, so much as it is a crude generalisation applied to a range of fields from economics to census studies. In economics, this rule is applied to income distribution in an economy and holds that "in many circumstances, 80% of the activity or outcomes stem from 20% of the causes" (Boslaugh, 2013, p. 105). For example, it is possible to state that in many countries, 80% of the national wage bill is distributed to 20% of the working population (Boslaugh, 2013). To create the PMI lists, the Pareto Principle was used to develop an algorithm to identify the 20% of modules that account for 80% of funded credits lost to course failures at UJ. The formula uses module pass rate, class size and module credit value in its constitution and once these

variables have been used to calculate the UJ Priority Module Index (PMI), it results in a list containing the 20% of modules that contribute 80% of the module failures at UJ. The list is in order from the highest PMI score to the lowest, but all modules in the list are in the UJ top 20% of module failure contributors. The PMI calculations for a specific semester are done as soon as the final results for the corresponding semester of the previous become available. This provides substantial time for the process below to then unfold. Higher education institutions are often good at identifying risk, but it has been found to be much trickier to know what to realistically do to mitigate the risk.

ISSI Intervention Process

Once the Priority Modules for a specific semester have been identified, the Academic Development Centre, in close collaboration with the various Faculties, decide on the best way to intervene to support student success in each of the selected modules. This planning process is completed through collaborative discussions between senior ADC staff, the various Vice-Deans for Teaching and Learning, and the module lecturers. A Faculty-generated plan forms the basis for the preparations by the support divisions for an initial meeting with the module lecturers. This meeting consists of an intervention leader and representatives of all the appropriate support services to ensure a multi-disciplinary approach to interventions. At this initial meeting, the problem and plan are discussed further and the intervention is refined before implementation proceeds, which normally lasts for the semester. The interventions are usually limited to between 3 and 5 to ensure realistic expectations and traceability and typically consist of a selected and customised combination of activities.

The lead-time built into the ISSI process allows a variety of institutional resources to be focused on the selected PMI modules in addition to the interventions aimed at supporting student success mentioned above. These resources are also targeted where they can make the biggest difference and where their availability can be made part of teaching plans and module processes. Additional institutional resources that are focused accordingly include a strategic tutor fund to provide additional tutor support to ISSI modules, the prioritisation of UJ funded e-books in PMI modules and an ISSI implementation fund that is used to fund small, once-off implementation expenses.

To ensure that the ISSI is adopted as an institutional approach, UJ has also re-focused and expanded its committee structure to facilitate and support the ISSI implementation. The whole project is coordinated and supported by an institutional Student Success Committee (SSC) involving high-level representatives from all stakeholders and functioning as a subcommittee of the UJ Senate Teaching and Learning Committee (STLC). Each Faculty also has a Teaching and Learning committee and a Vice-Dean for Teaching and Learning to enable, support and provide oversight to the ISSI implementation in each Faculty.

The ISSI has been implemented for the past 2 years (4 semesters) and the question of its efficacy arises, as part of its data-informed approach. The most important measure of potential influence would be to evaluate the results of modules over time as well as to monitor activity in each module. The ISSI implementation up to this point has shown promising signs of improvement, as is discussed below.

How Do We Know if the ISSI is “Working”?

In this section, the performance of modules that participated in the intervention over its 24-month existence is evaluated in order to look for indications of improvement. No strong causal claims can be made when the potential influence of an intervention on a variable such as module success rate is investigated. It is, however, also true that improved module success is a necessary condition for any positive influence to be observed.

Figure 2 is a representation of the Admission Points Score¹ (APS) per Faculty over the five years from 2015 to 2019. This figure shows that the previous academic performances of students differed from one Faculty to the next, but did not differ substantially from one year to the next in any given Faculty. Therefore, the academic preparedness of the groups of students whose current academic performance will be compared remained relatively stable and was not a significant factor in determining academic performance.

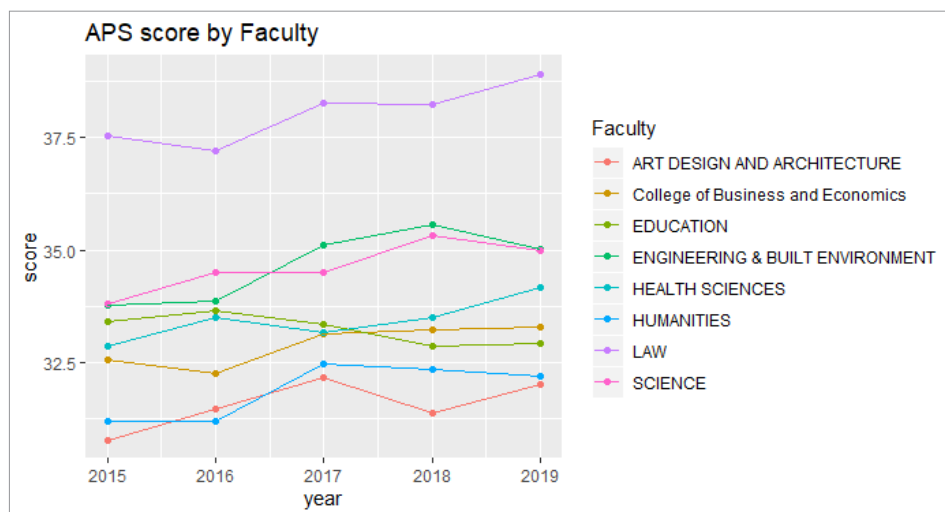


Figure 2: APS score by Faculty

Academic Performance of Modules Involved in the ISSI

To investigate the influence of the ISSI, the context of the academic interactions and the student results were considered. To do this, the student academic performance in modules that were exposed to the wide-ranging activities of the ISSI in 2018 and 2019 were compared directly to the previous year's performance, i.e. 2017 and 2018 and 2018 to 2019 in the same modules.

Before comparing the academic performance of modules involved in the ISSI per annum, they were compared per semester. The academic performance of the modules being compared is first shown in the semester preceding the ISSI involvement (pre_

1 The APS score is used in the South African higher education sector to calculate a prospective student's level of academic attainment in high school. It is used as a crude measure of readiness for tertiary studies.

ISSI_successR) and then during the semester of ISSI involvement (ISSI_successR). Figure 3 shows the success rates of first semester modules using boxplots to represent the distribution of the 25th and 75th percentiles, the median, the mean and any outliers. The academic performance of the first semester modules that were exposed to the ISSI improved by 3.1% on average and the impact on how these success rates are distributed clearly indicates a general improvement in success rates. The 3.1% increase resulted in modules typically obtaining success rates of between 60% and 100%. Only one module recorded a success rate of below 60%, while another recorded a 100% success rate. The cluster of eight pre-ISSI modules that recorded success rates of less than 60% have mostly migrated beyond this threshold.

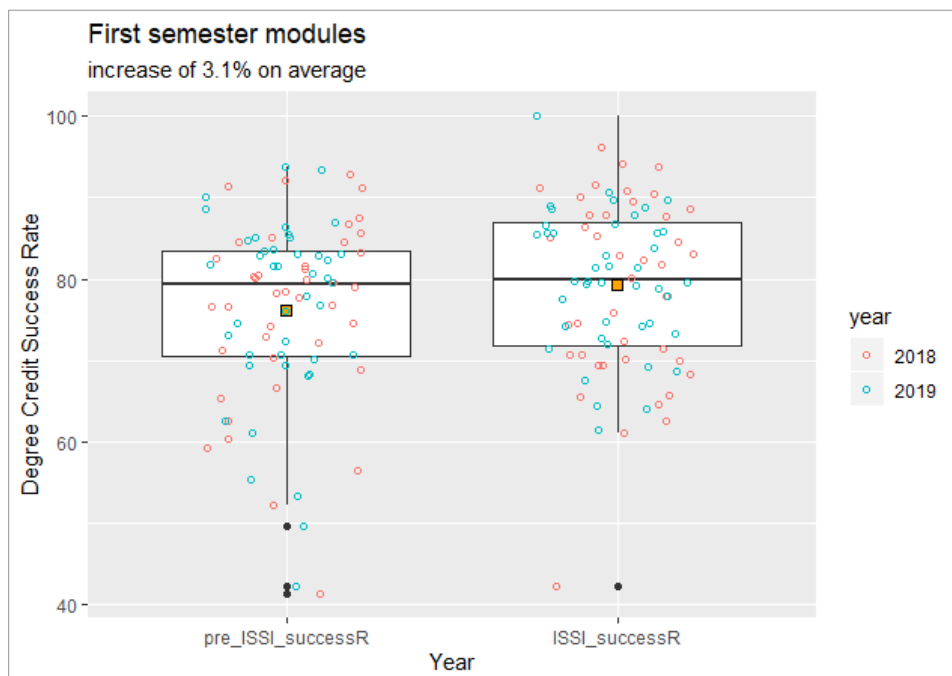


Figure 3: First semester modules

Figure 4 illustrates that second semester modules which participated in the ISSI increased by 3.4% from the pre-ISSI to the ISSI involvement phases. When one considers the blue and red points arranged along the y-axis of each group, it is notable that a cluster of 2019 second semester modules responded well to the interventions of the ISSI. Five 2019 second semester modules recorded success rates of below 60% before they participated in the ISSI. Subsequently, two modules narrowly missed out on recording success rates of more than 60%. At the opposite end of the scale, it is notable that a larger group of modules moved beyond the 90% mark. Before they were exposed to the interventions of the ISSI, only two modules recorded success rates of 90% or more. After exposure to the ISSI, nine modules have achieved success rates of more than 90%.

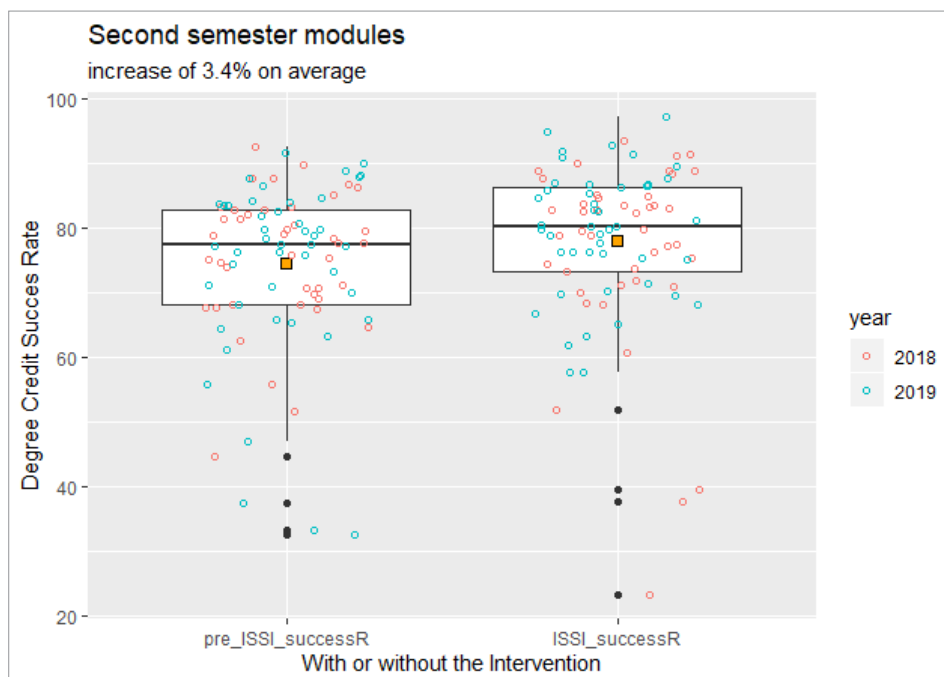


Figure 4: Second semester modules

Figure 4 hints at an observation that becomes clearer when boxplots are drawn showing the data grouped by year of participation in the ISSI. Figure 5 illustrates that the modules that participated in the first round of ISSI interventions (2018) improved by 2%. A group of modules underperformed in the second semester of 2018. During this time the processes and procedures of the ISSI were still being refined and it is likely that this led to significant changes in the way that certain modules function. As a result, this may have influenced success rates negatively as academic staff found themselves adapting to new teaching and learning methods and processes.

On the other hand, Figure 6 suggests that the interventions of the ISSI have become more efficient and effective over time. Whereas a cluster of modules under-performed significantly in the second semester of 2018, in 2019 the second semester modules improved significantly. An average increase of 4.5% can be observed for modules that participated in the ISSI in 2019.

Even though the module success rates of modules involved in the ISSI is in many ways a crude measure, and because any claims to direct causality would be ill-advised, the patterns seen above appear to indicate a link between ISSI interventions and improved module success rates. When the improved pass rates are translated into individual module passes, it is clear the ISSI has contributed to thousands of additional module passes.

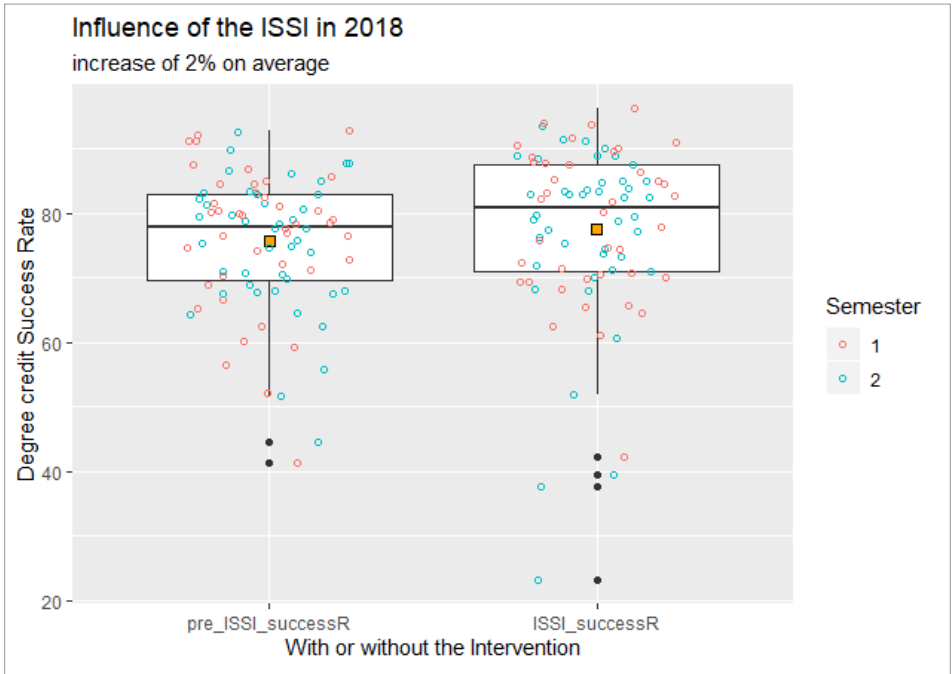


Figure 5: Influence of the ISSI in 2018

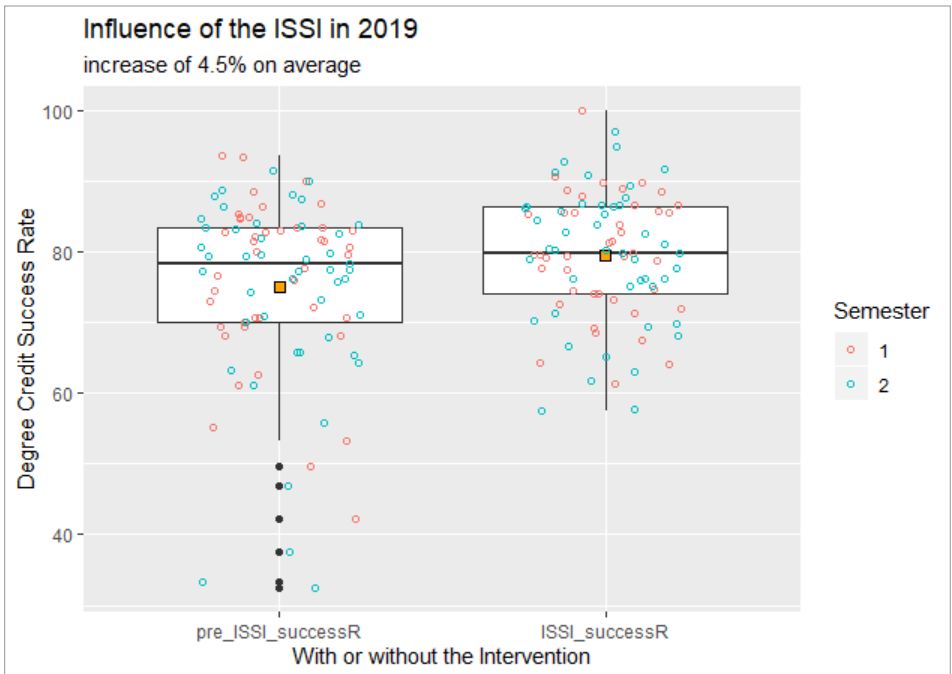


Figure 6: Influence of the ISSI in 2019

Lessons Learnt and Conclusion

The two years of ISSI implementation at UJ have contributed substantially to the way in which student success matters at the institution are conceptualised and implemented. Some of the main lessons learnt include the following:

An institutionalised approach to student success has the potential to bring the enablers and disablers of student success to the surface and to move towards substantial improvements in student success.

An approach that uses data at every appropriate part of the process allows for the student success conversations and practices to be held at higher academic levels and to move away from being merely anecdotal.

An institutional student success strategy provides a vehicle that is able to instigate, combine and institutionalise student success contributions from across the institution as a whole, and when it works this creates a synergistic collaboration that is very powerful for enhancing student success.

Data-informed but action-orientated high-level institutional structures, such as a Student Success Committee, as well as appropriate Faculty Committee structures that support student success make implementation possible. Focusing institutional resources where they can make the biggest difference (and by using data in the process) can have a powerful effect on student success.

When academics and support staff work together in teams and in structured ways, it often leads to creative and effective collaborative partnerships that create environments that enable effective student learning and student success. These partnerships also tend to persist long after officially sanctioned interventions have been completed.

The conceptualisation and implementation of the UJ ISSI has brought a sea change in the student success efforts at the institution. The structures, policies and systems that have emanated from the SSC, or that have been influenced by it, and the positive effect of the ISSI may potentially benefit students and the institution for the foreseeable future.

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