DEVELOPING SKILLS OF ENTERING FIRST YEAR SCIENCE STUDENTS: FOCUSED FIRST YEAR SEMINAR

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Abstract–Concern at the failure rate of first year Science, Health Sciences and Engineering students is challenging first year lectures to interrogate the knowledge and skills gap of entering students. Underprepared students have entered higher education for centuries but the problems in transition from school to university seem to be increasing from year to year. Every cohort enter universities with high expectations and good school results and then they are confronted with challenges of transition, new content and an uninviting environment. The Faculty of Science has been presenting an academic First Year Orientation seminar since 2005 and refined the format of the current programme which is a two week (six hours per day) credit-bearing module, the First Year Seminar (FYS). The programme consists of a 10 hour Language course, a 6 hour Laboratory skills and 10 hour Problem Solving skills for 10 hours. These modules are presented by dedicated academics and support staff in the faculty, and student mentors (senior students) take responsibility to get to know the students better as they work with them on a daily basis. This study reports on research conducted to determine the influence and success of the FYS on the academic preparation of first-year students in 2014. The data set contains school results, biographical and personality profiles, results from a survey completed after the FYS and perceptions after interviews with students, mentors and lecturers. Appropriate inferential statistics were employed in the analysis of the survey response and interviews as indicators of the value added by the FYS. The results will indicate how the FYS enhanced the existing knowledge and skills of entering first year students in order to place diverse students on an equal platform when official lectures and practical sessions commence during the semester.

Keywords: First Year Transition, First Year Experience**,** First Year Seminar**,** Academic Achievement in Science programmes

1. INTRODUCTION

The international trend of dedicating specific emphasis to first year students entering higher education (HE) has become more relevant in the South African (SA) context. In 2009 the first, First Year Experience (FYE) conference was held in Stellenbosch, South Africa (Leibowitz, Van der Merwe & Van Schalkwyk, 2009, p.3) and since then first year programmes and academic progress have been discussed on all SA campuses. Underprepared students have entered HE through the ages but the difficulty in transition from school to university seems to be increasing from year to year. The failure rate of first year Science, Engineering, Technology and Health Sciences (SETH) students is a matter of concern and is pertinent for relevant departments and also the economy of any country. In the past 20 years South African HE has increased enrolments by 80% (RSA, 2012, p.37). Many students who would have been excluded from university studies, specifically in Sciences are now being accepted and students from various academic backgrounds are entering the Higher Education institutions (HEIs) in pursuit of qualifications (Tait & Godfrey, 2001).

Granting more opportunities for more students' impacts on enrolment but also has a tremendous effect on the academic throughput rate, more so in Science programmes (CHE, 2013, p.13). More non-traditional students enter higher education (Giancola, Munz & Trares, 2008) and typically this massification decreases the success rate of students at risk The insufficient prior educational experience, unsatisfactory school performance and a first-generation status are but some of the characteristics identified by Cavote & Kopera-Frye (2007), Olive & Russ (2010) and Bowl (2001) to

explain the lack of information and poor-preparation by their schools for the expectations of Higher Education (HE).

Universities with high numbers of non-traditional students will be challenged to retain these students in the system (Laing & Robinson, 2003) in order to complete their degrees. Academics have been investigating "dropping-out" over decades (Bunting, 2004; Slotnick, Pelton, Fuller, & Tabor, 1993; Kimbrough & Wearver, 1999) and it seems that dropping-out can be attributed to the economic and social pressures experienced by these students. Higher education has accepted that schools are not going to prepare students better and are confronted to develop strategies and even formal programmes (Kift 2008) to prepare Science students adequately and academically and increase their level of confidence, enabling them to cope with their first year studies in Science. This paper thus focuses on the measurement of the First Year Seminar designed by the Faculty of Science, UJ. Its purpose is to determine the influence of a nine day intervention in laboratory, language or problem solving skills.

2. STUDENT TRANSITION

Student transition from school to HE has been investigated and interrogated at length (Briggs, Clark & Hall, 2012; Jacobs & Jacobs, 2013; Bowles, Dobson, Fisher & McPhail, 2011, and Kift, 2009 among others) and presents significant challenges to all parties concerned. The enormous step or "gap" (Sappa & Bonica, 2008) is between two institutions, the school on one side and the university on the other side with the entering first year student caught in between. Winterson & Russ (2009) encourage both institutions to make the transition process easier but given the SA school context the schools are challenged with shortages of qualified teachers, lack of facilities and resources (Jacobs, 2010) so that they are less concerned with what happens after school.

Briggs, *et al* (2012) argue that students entering HE make a personal investment using their cultural capital which was accumulated through their prior education at school. Academics have been aware of the problems of transition and support students' needs not just in classes and laboratories but also assist with the significant social shift for the students.

2.1 dapting of First year students

The problems with adaptation are amplified in environments where the first year student is a first generation university student; older than all other first year students; or where the student is from an ethnic group that is under-represented in the population of students at university. Briggs *et al.* (2012) elaborate on the importance for these students to create a new identity for themselves as a HE student. Students entering HE struggle to envision their life at university and cannot accurately predict their future experiences at university (Smith & Hopkins, 2005; Longden, 2006; Joint Information Systems Committee (JISC), 2007). The research that focuses on student aspirations, expectations and decision-making by Peel, (2000), Sander, Stevenson, King & Coates (2000) and Tranter (2003) indicates the discrepancy between what the students aspire to as pre-transfer students and the reality of what their experience will be in their first year of studies. James (2000) and Hillman (2005) agree that students may even withdraw (drop-out) due to their lack of knowledge and uninformed decision-making relating to their choice of studies and/or institution. The clear link between the experiences of first years and retention rates has been investigated by Yorke & Longden (2008) and they found some of the most prevalent reasons for students leaving university prior to obtaining a degree is poor decision making regarding their choice of studies, leading to a decrease in their commitment towards completing the degree; and finance. Most of the students exiting university before the completion of their degrees seem to be first years (Ertl; Hayward; Wright; Edwards; Lunt; Mills, & Yu, 2008).

2.2 Tracking students in SA

In the CHE report (2013, 52) it is stated that "(T)he current higher education system is not producing sufficient graduates to meet national needs in respect of economic and social development…" The report indicates that only 35% of students graduate within five years and an estimated 55% will

never graduate. Given the 899 120 intake in 2011 almost 500 000 students will drop out without any qualification. Can SA afford this?

Bundy (2006, p.12) found that substantial growth in the participation of Black students and academic staff in higher education since 1996. Whereas only 12% of the SA HE population comprised of Black students in 1993 (NCHE, 1996, p.64), it increased sharply to 59% in 1999, 65% in 2002, and 79% in 2010 (CHE, 2013, p.39). The growth in Black student participation also introduced complications with retention and progress. Bundy (2006, p.12) notes that "…access gains also prove less healthy when measured against student success levels". A 'wasteful' number of enrolled students fail to complete their studies, there is a decline in retention rates, and dropout rates are as high as one out of five".

There are no grounds to expect these patterns to change in the near future, since they have remained unchanged since the cohort intake of the year 2000; and looking at the current educational system as a whole, the conditions will not change unless we implement systems that will be able to support and bridge the gap experienced and faced by these students. It is against this backdrop that the University of Johannesburg has implemented the First Year Programme to accommodate the underprepared students entering the institution.

3. FIRST YEAR PROGRAMMES

Internationally, the transition of students to HE has been a well-established research field since the 1970s (Akerlind, 2005, p.1) and is actively pursued in South African HEIs over the last decade. Dedicated First year experience (FYE) centres are common in the USA and these centres serve to ease student transition into university curricula and standards such as the Centre for Academic Enhancement (University of Georgia). They are also increasing in European, Asian, UK and Australian HE (Meyers & Ryan, 2008). Furthermore, HEIs offer formalised orientation (induction) programmes for transitional students (Kift, 2008).

Adaptation and socialisation can be encouraged by adequate support systems provided by university staff (Briggs *et al.,* 2012). First Year programmes have been providing first year students with a support system that focuses on making the adjustment to university life easier as well as providing them with valuable workshops in improving their prior knowledge in the subject fields of Mathematics and related science fields. The First year seminar (FYS) should place emphasis on time management and study skills and include opportunities for students to participate in social activities and engage with peers and faculty members according to Landis (2005). Students are admitted to universities before having been afforded the time to become acquainted with the institution. Experts such as Astin (1999, p.518), Tinto (2008, p.14) and Eiselen (2006, p.91) listed institutional factors that enhance student academic success:

The student should:

- be socially and academically integrated;
- identify with peer groups (although Science students often feel alienated);
- be integrated into the institutional culture; and
- be an involved student.

Pascarella & Terenzini (2005) and Keupp & Barefoot (2005) reiterate that participation of first years in these seminars has a tremendous positive effect on their ability to make the adjustment from school to university as well as retaining the students until they enter their second year of studies. A positive attribute of the FYS is that the workshops take place in smaller groups and students are grouped according to their specific fields of study which assists in building relationships amongst their fellow students and peers. Buote, Pancer, Pratt, Adams, Birnie-Lefcovitch, Polivy, & Wintre (2007) suggest that the first year students need to engage with one another in order to build friendships that will help them to adjust to life at university as well as the pressure of academic demands on them. Research indicates that the result of collaborative learning is better learner

involvement, increasing their performance as well as increasing their productivity (Nunamaker *et al*., 1997; Alavi, 1994).

The purpose of a first year seminar is to boost the social and academic integration of first year students (Pascarella & Terenzini, 2005). This is accomplished by organised workshops introducing the students to various topics in their study field as well as tools on how to achieve your academic goals. Furthermore these seminars include sessions that introduce the students to various facilities on campus and support services that are made available to these students to make the adjustment to university easier. It is very important that close relationships are established, during the FYS, between the students and faculty staff (Pascarella &Terezini, 2005).

Many students in their first year of study feel alone and isolated at university, even though they are surrounded by thousands of other fellow students studying at the same institution. Tinto (2008) points out that students who attended rural schools and had to leave home to attend university usually do not have family and friends to rely on for support and fully rely on the guidance and support offered by faculty staff and senior students. Harvey & Drew (2006, p. iii) emphasise that first year students will acclimatise must faster to their new university environment if they feel that they belong there. Students in this first stage of transition need to develop their own student identity (Huon & Sankey, 2002) and learn to behave like university students (Fazey & Fazey, 2001). Otherwise, they will feel confused and lose their personal identity (Scanlon *et al*., 2005), resulting in terminating their studies.

First year students are often over confident (Oliver, 2008), and lack the ability to determine the difference between what they know and are able to achieve (Rowlands *et al*, 2008). A suggestion from Goldfinch & Hughes (2007) is that the confidence of students should be directed into suitable learning opportunities where their learning skills are constantly being developed. Furthermore, Kimmins & Stagg (2009), emphasise that this will ultimately lead to a dichotomy in the method required by the lecturers, due to the fact that first year students demonstrate a high, unsupported level of confidence in “what they think they know” regarding their academic skills but shows a lower level of confidence when it comes to applying these academic skills towards solving mathematical problems or writing a scientific report.

The first year seminar allows students to become aware and recognise the level of their personal academic skills allows for guided support and assists them to develop their skills (Kimmins & Stagg, 2009). First year seminars create a safe environment where these students can find the required support and provide them with relevant learning opportunities that are focused on developing the skills required for the various disciplines in Science. Erickson, Peters, & Strommer, (2006); Evans, Forney, & Guido-DiBrito, (1998); Pascarella & Terenzini, (1991, 2005) and Skipper, (2005), summarised that FYS programmes have the capacity to create an environment where students can develop their critical thinking skills needed for their intellectual growth.

3.1 Science FYS at UJ

The University of Johannesburg (UJ): Faculty of Science acknowledges the under-preparedness of first year students and uses the first two weeks to assist the students with the transition. The programmes are structured well so that the lecturers can start teaching content when the semester commences. During the first year seminar the workshops in laboratory skills, mathematical problem solving and academic literacy for science can both provide content knowledge and increase their confidence. The first year modules are taken by students in Science, Science, Health Science and Engineering and therefore these students were all invited to register for the FYS.

The FYS will ensure that these students (mostly underprepared) will have a well planned introduction to the various aspects of being a Science student. The programme included:

- Five (2 hour) sessions focusing on Academic literacy (language). Bowl (2001) emphasises the fact that non-traditional students may struggle to write scientific reports and essays. These sessions

serve as opportunities for the students to learn how to improve their reading and writing skills with specific focus on Science modules.

- Five (2 hour) sessions focusing on solving mathematical problems with special focus on bridging the gap in content knowledge from school to university; in other words students will perform fundamental Mathematics and Numeracy to increase their proficiency to a level we would enable them to enter Higher Education.
- Three (2 hour) sessions introductory laboratory sessions, where students are introduced to Chemistry, Physics and Biology laboratories and are familiarised with various items of laboratory equipment used for different experiments. Many of the students entering the Faculty of Science come from rural schools where they have never been introduced to laboratory work. The sessions focus on allowing the students to perform basic laboratory techniques and acquire skills to identify equipment, enhance accuracy and also safety in laboratories.

Other extremely valuable sessions presented throughout the seminar are a discussion on timetable and time management. According to Ballinger (2002), students often struggle with managing their own timetable as well as meeting deadlines for assignments. We distribute the timetable booklet and get them acquainted to use the book and dates provided to keep them informed about their assessments, etc. The students are also informed about assessment at university, tests, practicals and exams that they will write and topics such as "What is required to pass?" is discussed during the session. Carefully selected staff from each discipline will present a session where they discuss study skills in various disciplines (Mathematics, Physics, Life Sciences, Chemistry, and Geography). Winterson & Russ (2009) point out that students have to become accustomed to various learning styles, referencing techniques as well as note-taking used at university. Due to the fact that research and the writing of academic essays and reports forms such an integral part of Science the first year students also attend a session where they meet with the Faculty Librarian. During this session she takes them on a tour through the library and then they sit and proceed with completing a short essay on a theme where they have to use the Internet, Journal, Textbook and database.

The first year students are also encouraged to get to know the campus as soon as possible and before the formal lectures start. This is done by facilitating an "*amazing race game*" where students in smaller programme groups receive a map of the campus and they should visit points of interest, take a photo of that place, and the first group back receives a small prize. This allows them to get to know the campus in a fun and exciting way as well as working together with their fellow students.

4. RESEARCH

4.1 esearch methodology

4.1.1 ticipants and sampling

Purposive sampling was used when, during the beginning and the end of the 2014 FYS (organised by the Faculty's First Year Experience), all participants (first year students were requested to complete a test (with 25 questions) prior to starting with the FYS. A total number of 865 students completed the test on the day of arrival. After nine days of FYS they were again requested to complete the same assessment and 716 completed the test. Of these 568 students participated in the pre- and post-FYS test and these were used in the analysis. In Table 1 a demographic analysis of the participants are provided.

Table 1: Demographic Analysis of Participants

Variable		N	%
Gender	F	209	38.6
	M	333	61.4
Ethnic Group	African	424	78.2
	Coloured	16	3.0
	Indian	31	5.7
	White	71	13.1
Home Language	African	393	72.5
	English	118	21.8
	Other	31	5.7
Province	Eastern Cape	7	1.3
	Free State	6	1.1
	Gauteng	334	61.6
	Kwazulu Natal	22	4.1
	Limpopo	111	20.5
	Mpumalanga	35	6.5
	Northwest	13	2.4
	Northern Cape	1	0.2
	Western Cape	3	0.6
	Other	10	1.8
Programme	Diploma	1	0.2
	Engineering	108	19.9
	IT	144	26.6
	Life & Env Sc	158	29.2
	Math Sciences	55	10.1
	Phys Sciences	76	14.0

Based on the demographic analysis of the first year group that participated in the pre/post survey, consisting of 542 students. As expected there were more males (61.4%) as Sciences and especially Engineering are male dominated. The average student in the FYS would be African (78.2%) from Gauteng province (61.6%) and the largest group was studying Life and Environmental Sciences (29.2%) or Information Technology 26.6%).

4.1.2 a collection instrument

The 25 question multiple choice test forms part of the First Year Seminar aimed at determining the content knowledge they have regarding Laboratory Skills, Language and Problem Solving (similar to Quantitative Literacy). There were 10 questions on biographical detail and five on each in the three sections (constructs). Respondents were requested to complete the test upon arrival on the first day. After a nine day programme (see detail above) the students were requested to complete the same test as a post-test on the last day but some students did not participate in this opportunity.

4.1.3 Quantitative data analysis

To compare the students' pre- and post-FYS results, paired-samples t-test, including Pearson's product moment correlation coefficients, was conducted on the three pairs of constructs, for students who submitted for both tests. The SPSS statistical package was used to conduct the analyses.

4.1.4 eliability and validity of the collected data

This was the first year that we did a pre-test on all three constructs. Previous years the teams responsible for the three different sections (Lab skills, Language and Problem Solving) had students complete a base-line test in the first session. This investigation served as a pilot study and the reliability will only be tested in 2015 when the adapted test will be used again.

The specialist lecturers in the three divisions checked the questions to confirm suitability. The lecturers validated each item for content and are comprehensive enough to test knowledge of students entering science programmes. Items were selected from previous base-line tests and thus have sight-validity as well.

4.2 esearch findings

A paired-samples t-test, including Pearson's product moment correlation coefficients, was conducted on the three pairs of pre-FYS and post-FYS assessment results. Tables 1, 2, and 3 below summarise the respective paired samples of t-test statistics, correlations and test findings.

Table 2: Paired Sample Statistics

		Mean	N	SD	Std error mean
Pair 1	Pre Lab Skills	72.24	539	19.510	.840
	Post Lab Skills	75.99	539	19.210	.827
Pair 2	Pre Language	49.02	501	19.961	.892
	Post Language	70.34	501	19.414	.867
Pair 3	Pre-Problem Solving	45.08	516	17.833	.787
	Pre-Problem Solving	66.51	516	14.355	.632

Table 3: Paired Sample Correlations

		N	Correlation	Sig.
Pair 1	Pre-Lab Skills & Post-Lab Skills	539	.435	.000
Pair 2	Pre-Language & Post Language	501	.320	.000
Pair 3	Pre-Probl Solv & Post-Probl Solv	516	.228	.000

Table 4: Paired Sample Test Differences

	Mean	SD	Std error mean	99% conf. interval of the difference		t	Df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 Pre-Lab Skills Post-Lab Skills	-3.748	20.588	.887	-6.040	-1.455	-4.226	538	.000
Pair 2 Pre-Language Post-Language	-21.317	22.958	1.026	-23.969	-18.665	-20.784	500	.000
Pair 3 Pre-Problem Solving / Post- Problem Solving	-21.434	20.219	.890	-23.735	19.133	-24.081	515	.000

The paired-samples t-test and Pearson's correlational findings confirmed that the students' Lab skills post FYS assessment results differ significantly (M = 75.99, SD = 19.210) from marks in the post FYS assessment (M = 72.24, SD = 19.510), t (538) = -4.226, p < 0.001, d = -0.194. This was also the case in respect of Post FYS Language skills (M = 70.34, SD = 19.414) in comparison to their Pre FYS Language (M = 49.02, SD = 19.961), t (500) = -20.784, p < 0.001, d = -1.083. In the case of Post FYS Problem Solving skills (M = 66.51, SD = 14.355) in comparison to their Pre FYS Problem Solving skills (M = 45.08, SD = 17.833), t (515) = -24.081, p < 0.001, d = -1.332.

The analysis of mean performance of students in all three categories in both tests determined a statistically significant difference (p < 0.001) between the pairs showing the difference between the groups based on the treatment in this research the FYS programme. The effect size indicates the effectiveness of the programme and was calculated using Cohen's d effect size values above (e.g. d = -1.332). The difference between PRE and POST measurements are standardised and then compared to 0.

Cohen provides the standard interpretation as .8 (large or 8/10 of a standard deviation unit); .5 (moderate or 1/2 of a standard deviation) and .2 (small or 1/5 of a standard deviation).

The effect size calculated by Cohen's d in this research are –0.194 (Lab skills); -1.083 (Language skills) and -1.332 (Problem Solving)). According to Cohen's standard interpretation the Language and Problem Solving suggested a very high practical significance (more than .8) and small practical significance with regard to the Lab Skills findings (less than .2). This indicates the effectiveness of the FYS programme.

4.4 Empirical synthesis

The empirical investigation generated the following noteworthy findings:

- **Language**: The academic literacy module served the students well and they perceived it as valuable. Lecturers report that they can determine from the lab reports which students did not attend the FYS.
- **Problem solving**: The value added by getting them to start thinking after six weeks of holiday cannot really be quantified but students reported this was a meaningful experience.
- **Laboratory skills**: Data above indicate that students had a good idea of what is expected, yet these are the sessions which they enjoyed the most and got to know each other – thus very valuable.

5. DISCUSSION

This study reaches the conclusion that there is a clear difference between the students that attended the FYS and those who don't. Participation in the FYS can significantly increase the student's ability to make a successful transition to university, enabling them to complete their qualification.

The objective of the FYS is not only to help them adjust but to increase peer and faculty interaction and to give the students an opportunity to engage with their lecturers in a less formal setup. The findings suggest that the workshops focusing on mathematical problem solving and academic literacy enhances student development and assists in bridging the gap due to the lack of good teaching practices at school. More research will have to be done to understand the impact of FYS on students entering HE. The current study will assist the staff involved to make the necessary changes to the programme in order for the first years to make a great success of their academic careers at UJ.

REFERENCES

Akerlind, G.S. (2005). Academic growth and development – How do university academics experience it? *Higher Education, 50*, 1–32.

Ballinger, G. (2002). Bridging the Gap between A Level and Degree: Some Observations on Managing the Transitional Stage in the Study of English Literature. *Arts and Humanities in Higher Education, 2*(1), 99-109.

Barefoot, B. O. (1992). Helping first-year college students climb the academic ladder. Report of a national survey of freshman seminar programming in American higher education. Unpublished doctoral dissertation. College of William and Mary. Williambsburg, VA.

Borden, V.M.H., & Evenbeck, S.E. (2005). Changing the minds of new college . Paper presented at the 27th Annual European Association for Institutional Research Forum, 28–31 August. Riga, Latvia.

Bowl, M. (2001). Experiencing the Barriers: Non-traditional Students Entering Higher. *Research Papers in Education, 16*(2),141-160.
Bowles, A., Dobson, A., Fisher, R., & McPhail, R. (2011). An exploratory investigation into first year student transition to university. *Research and Development in Higher Education: Higher Education on the Edge,* 34, 61–71.
Briggs, S. (2005). Changing roles and competencies of academics. *Active Learning in Higher Education*, 6 (3), 256–268.
Briggs, A.R.J, Clark, J. and Hall, I. (2012). Building bridges: understanding student transition to university, *Quality in Higher Education,* 18:1, 3-21.
Buote, V. M., Pancer, S. M., Pratt, M. W., Adams, G., Birnie-Lefcovitch, S., Polivy, J., & Wintre, M. G. (2007). The importance of friends: Friendship and adjustment among first year university students. *Journal of Adolescent Research,* 22(6), 665–689.
Cavote, S., & Kopera-Frye, K. (2007). Non-traditional student persistence and first year experience courses. *Journal of College Student Retention*, *8*(4), 477–489.
CHE (Council on Higher Education). (2013). A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure. Pretoria: CHE.
Corkill, H., Elkington, S., & Lawrence, L. (2011). Exploring the parallel universes of staff and student transitions in higher education. *Research and Development in Higher Education: Reshaping Higher Education,* 34, 118–129.
Department for Business Innovation and Skills (2009). Higher Ambitions: The Future of Universities in a Knowledge Economy (UK: Department for Business Innovation and Skills).
Erickson, B. L., Peters, C. B., & Strommer, D. W. (2006). *Teaching first-year college students.* San Francisco, CA: Jossey-Bass.
Ertl, H., Hayward, G., Wright, S., Edwards, A., Lunt, I., Mills, D. & Yu, K. (2008). The Student Learning Experience in Higher Education: Literature Review Report for the Higher Education Academy (York: Higher Education Academy).
Evans, N. J., Forney, D. S., & Guido-DiBrito, F. (1998). *Student development in college: Theory research, and practice.* San Francisco, CA: Jossey-Bass.
Fazey, D. & Fazey, J. (2001). The potential for autonomy in learning: perceptions of competence, motivation and locus of control in first-year undergraduate students. *Studies in Higher Education,* 26(3), 345–61.
Giancola, J.K., Munz, D.C., & Trares, S. (2008). First versus continuing generation adult students on college perceptions. Are differences actually because of demographic variances? *Adult Education Quarterly*, *58*(3), 214–228.
Goldfinch, J., and Hughes, M. (2007). Skills, learning styles and success of first year undergraduates [electronic version]. *Active learning in higher education, 8*(3), 259-273.
Guram, A. (2011). *Teaching and working with first-year students*. Center for the First-Year Experience, University of Wisconsin-Madison: Wisconsin.
Harvey, L. & Drew, S. with Smith, M. (2006). The First-Year Experience: A review of literature for the Higher Education Academy (London, The Higher Education Academy).
Hillman, K. (2005). The First Year Experience: The transition from secondary school to university and TAFE in Australia, Longitudinal Surveys of Australian Youth, Research Report 40, Australian Council for Educational Research and the Australian Government Department of Education, Science and Training.
Huon, G. & Sankey, M. (2002). The transition to university: understanding differences in success', paper presented at the 6th Pacific Rim First Year in Education Conference: Changing Agendas, University of Canterbury, Christchurch, New Zealand, 8–10 July.
Indiana University-Purdue University Indianapolis (IUPUI) (n.d.). Retrieved from http://www.iupui.edu (accessed 9 June 2014)
Jacobs, M. (2010). *A framework for the placement of university students in science programmes*. (Unpublished PhD thesis). University of Free State, Bloemfontein.
James, R. (2000). How school-leavers choose a preferred university course and possible effects on the quality of the school–university transition. *Journal of Institutional Research, 9*(1), 78–88.
Joint Information Systems Committee (JISC), 2007, JISC Student Expectations Study, Findings from preliminary research. Available online at: http://www.jisc.ac.uk/publications/publications/studentexpectations (accessed 9 June 2014).
Keup, J.R. and Barefoot, B.O. (2005). Learning how to be a successful student: exploring the impact of first-year seminars on student outcomes. *Journal of the First-Year Experience and Students in Transition, 17*(1), 11–47.
Kift, S. (2008). The next, great first year challenge: Sustaining, coordinating and embedding coherent institution–wide approaches to enact the FYE as 'everybody's business'. *First Year in Higher Education Conference*, Hobart, Australia.
Kift, S. (2009). Articulating a transition pedagogy to scaffold and to enhance the first year student learning experience in Australian higher education: *Final report for ALTC Senior Fellowship Program*. Queensland University of Technology: Brisbane.
Kimbrough, D. & Weaver, G. (1999). Improving the Background Knowledge of Non-traditional Students. *Innovative Higher Education, 23*(3), 197-219.
Kimmins, L. and Stagg, A. (2009). Creating confidence: Developing academic skills and information literacy behaviours to support the precepts of tertiary academic performance. *Proceedings of the 4th Asia Pacific Conference on Educational Integrity (4APCEI).* Paper presented at the 4th Asia Pacific Conference on Educational Integrity (4APCEI). New South Wales, Australia.
Retrieved June 6, 2014, from http://eprints.usq.edu.au/6150/1/Kimmins_Stagg_AV.pdf.
Krause, K., Hartley, R., James, R., & McInnis, C. (2005). The first year experience in Australian universities: Findings from a decade of national studies. [Electronic version]. Melbourne: Centre for the Study of Higher Education, University of Melbourne.
Laing, C. & Robinson, A. (2003). The Withdrawal of Non-Traditional Students: Developing an Explanatory Model. *Journal of Further and Higher Education. 27*(2), 175–185.
Landis, R, B. (2005). "Retention By Design: Achieving Excellence in Minority Engineering Education", The National Action Council for Minorities in Engineering, California State University, Office of the Chancellor.
Leibowitz, B., Van der Merwe, A. & Van Schalkwyk, S. (2009). Introduction - Perspectives on the first-year experience. In B. Leibowitz, A. van der Merwe & S. van Schalkwyk (Eds.), *Focus on first-year success: Perspectives emerging from South Africa and beyond* (pp. 3–11). Stellenbosch: SUN Media.
Longden, B. (2006). An institutional response to student expectations and their impact on retention rates. *Journal of Higher Education Policy and Management, 28*(2), 173–87.
Nunamaker, J. F., Briggs, R. O., Mittleman, D. D., Vogel, D. R., Balthazard, P. A. (1997). Lessons from a decade of group support systems research: A discussion of lab and field findings. *Journal of Management Information Systems,* 13, 163-207.
Olive, T. & Russ, S. (2010). Desire for higher education in first-generation hispanic college students. *International Journal of Interdisciplinary Social Sciences*, *5*(1), 377–389.

Oliver, B. (2008). Commencing undergraduates' self-efficacy and ability in finding academic resources: are they improving? [electronic version]. *Studies in learning, evaluation, innovation and development, 5*(3), 1-8.
Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students*. San Francisco, CA: Jossey-Bass.
Pascarella, E.T., Pierson, C.T., Wolniak, G.C., & Terenzini, P.T. (2004). First generation college students: Additional evidence on college
experiences and outcomes. *The Journal of Higher Education*, 75, 249–284.
Pascarella, E. T., & Terenzini, P. T. (2005). *How college affects students: A third decade of research* (Vol. 2). San Francisco, CA: Jossey-Bass.
Peel, M. (2000). "Nobody cares": the challenge of isolation in school to university transition. *Journal of Institutional Research, 9*(1), 122–
34.
Rowlands, I., Nicholas, D., Williams, P., Huntington, P. Fieldhouse, M., Gunter, B., Whitey, R., Jamali, H., Dobrowolski, t., and Tenopir, C. (2008). The Google generation: the information behaviour of the researcher of the future. *Aslib Proceedings: New Information Perspective,*
60(4), 290-310.
Sappa, V & Bonica, L. (2008). Cooperative Learning and Support to the school to higher education transition: an integrated research-
intervention aimed at first year Psychology Students. Atti del IAIE-IASCE Conference "*Cooperative Learning in multicultural societies: critical reflections*", Turnin, 19-22 Gennaio 2008.
Sander, P., Stevenson, K., King, M. & Coates, D. (2000). University students' expectations of teaching. *Studies in Higher Education, 25*(3),
309–23.
Scanlon, L., Rowling, L. & Weber, Z. (2005). "You don't have like an identity you are just lost in a crowd": forming a student identity in the first-year transition to university. *Journal of Youth Studies, 10*(2), 223–41.
Skipper, T. L. (2005). Student development in the first college Year: A primer for college educators. Columbia, SC: University of South Carolina, National Resource Center for The First-Year Experience and Students in Transition.
Slotnick, H., Pelton, M. Fuller, M. & Tabor, L. (1993). *Adult Learners on Campus.* The Falmer Press.
Smith, K. & Hopkins, C. (2005). Great expectations: sixth-formers' perceptions of teaching and learning in degree-level English. *Arts and Humanities in Higher Education, 4*(3), 304–18.
Strydom, J.F., & Mentz, M. (2008). Should orientation for higher education teaching and learning be better? *South African Journal of Higher Education, 22*(5), 1088–1096.
Tait, H & Godfrey, H. (2001). Enhancing the Student Experience for Direct Entrants to the Penultimate Year of Undergraduate Degree Programmes. *Journal of Further and Higher Education,* 25(2), 260-265.
Tinto, V. (2008). *Access without support is not opportunity*. Inside Higher Ed. Retrieved June 8, 2014 from
www.insidehighered.com/views/2008/06/09/tinto
Tranter, D. (2003, July). *"*Fish out of Water": students from disadvantaged schools and the university experience. Paper presented at
Creating Spaces: interdisciplinary writings in the Social Sciences Conference, Australian National University, Canberra.
University of Johannesburg. (2009). Proposal for the implementation of a First Year Experience (FYE) programme at UJ. UJ Senate. (Unpublished internal document).
University of Johannesburg. (2013). Enrolment report: First semester. Faculty of Science. (Unpublished report.)
University of Wisconsin-Madison (n.d.). Retrieved from http://www.newstudent.wfsc.edu (accessed 9 June 2014)
University of Washington (2001). *Teaching and Learning Bulletin*, *5*(1). Seattle, Washington: Center for Instructional Development and
Research.
Winterson, J. & Russ, M. (2009). Understanding the Transition from School to University in Music and Music Technology. *Arts and Humanities in Education, 8*(3), 339-354.
Yorke, M., Bell, R., Dove, A., Haslam, E., Hughes-Jones, H. & Longden, B. (1997). Undergraduate Non-Completion in Higher Education in England (Bristol, Higher Education Academy).
Yorke, M. & Longden, B. (2007). The First-Year Experience in Higher Education in the UK, Report on Phase 1 of a project funded by the Higher Education Academy, Bristol, Higher Education Academy.
Yorke, M. & Longden, B. (2008). The First-Year Experience in Higher Education in the UK Phase 2 (York: The Higher Education Academy).