

## Factors influencing academic success or failure of first-year and senior university students: do education students and lecturers perceive things differently?

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South African universities are changing in several very important ways; their entry standards are changing, their programmes are focusing more specifically on the outcomes that learners are required to achieve, and their student populations are becoming more diverse. These changes are occurring in a climate of increased accountability. It is, therefore, important for universities to be concerned about the standards of their academic programmes and about the success rates of students. Together, these factors have produced a range of opinions about what needs to happen in universities if the diverse range of students is to be successful in outcomes-based programmes that maintain high standards. Some educators argue that entry standards are the most important determinants of success at university; others maintain that non-academic factors must also be considered. There is considerable evidence that the views and expectations about success held by lecturers and students are not always consistent. This article presents the results of a recent empirical investigation at the University of Pretoria that attempted to identify the post-enrolment factors that lecturers and students perceived as having important influences on students' success in their university studies. The study investigated the different expectations of first-year students, senior students and lecturers and identified numerous important similarities and inconsistencies. Most notably, there was a high and significant correlation between the rankings the three groups (lecturers, first-year students and senior students) gave to 52 factors linked to successful university study. There was also a high and significant correlation between the rankings of lecturers and senior students on 55 factors suggestive of unsuccessful university study. However, the perceptions of first-year students were not strongly correlated with either lectures or senior students. This suggests that first-year students may have unrealistic expectations about the non-academic factors that could reduce their chances of successful study. The results of the research could be used in three ways. University administrators could provide more supportive learning environments to enhance the chances that students will be successful and lecturers could also use the information to enhance the influences of positive factors on student learning. The influence of negative factors could also be minimised accordingly. Finally students could also be assisted and supported to approach university studies in a way that will increase their chances of success.

### Introduction

Students entering South African universities come from a wide range of social and cultural backgrounds that give them very different life experiences, different educational opportunities and a great variety of expectations, needs and academic potential (Chikte & Brand, 1996; Goduka, 1996). This situation also occurs in other countries that have shifted the focus of higher education from elitism to mass opportunity (McKenzie & Schweitzer, 2001). Despite the changing characteristics of those aspiring to attend university, the general entry requirements for undergraduate programmes in South Africa universities have changed little in the past ten years. It is against this background that the authors of this article have explored some of the issues that determine whether or not those entering undergraduate programmes are likely to experience success in their academic endeavours.

When students are admitted to a higher education institution there is a tacit assumption that they will be capable of successfully completing the course in which they are permitted to enrol. To knowingly admit students who, for whatever reason, have no chance of academic success would be immoral. Therefore, it is necessary to have entry requirements that permit valid student selection decisions to be made. In South Africa, this usually means that there is an assumption that learners who have achieved an above-average performance in their school matriculation examination will be capable of success at university. However, there can be no guarantee that these students will eventually satisfy the requirements for graduation.

The practice of using school matriculation results as the sole or primary determinant for university entrance is common in many countries, such as Australia and the USA, where there is strong competition for university entrance. There is some research support for this practice (e.g. McKenzie & Schweitzer, 2001) but, in general, the ability of these techniques to predict student success has been quite limited (Riggs & Riggs, 1990-91; Graham, 1991). Even in studies that show some promise, there is need for caution. For example, Manning, Killen and Taylor (1993) found a correlation of 0.415 between the New South Wales Higher School Certificate tertiary entrance (TE)

score and the grade point average (GPA) of 2,287 undergraduate students in courses at the University of Newcastle, Australia. However, Manning *et al.* (1993) concluded that varying the cut-off TE score required for entry to university (at least within the range 230 to 300, where 500 is the maximum score) would have "little effect on the probability of success of the cohort" (p.39) of students studied. Rather, they suggested that "selection of cut-off points is more related to supply and demand than it is to predictive validity in terms of potential success" (p.40). Similar conclusions about the limited predictive value of school academic performance or university entrance examinations have been reached by Chase and Jacobs (1989), Johnes (1990), and Larose and Roy (1991). Attempts to predict the success of mature-age students on the basis of standardised tests have met with similar limited success. Manning *et al.* (1993) report a correlation of only 0.202 between scores on the Australian Scholastic Aptitude Test (Form 101) and the GPA of a group of 252 mature-age students in undergraduate programmes. In South Africa, there is limited evidence of the predictive validity of matriculation results. Behr (1985:111) claimed that Senior Certificate examination results were the best single predictor of academic success at tertiary level; and Jawitz (1995:103) claimed that matriculation results (with the exception of the then Department of Education and Training matriculants) correlated well with success at university level, particularly at first-year level. Recent curriculum changes in South Africa mean that these claims must now be treated as problematic.

There is ample evidence in the literature on teaching and learning to suggest that factors such as teaching strategies (Bartz & Miller, 1991), the students' motivation (Talbot, 1990), the students' approach to studying (Meyer, 1990), the interaction between students and the academic and the social systems of the university (Tinto, 1975), cultural expectations (Ginsburg, 1992), psychosocial factors (McKenzie & Schweitzer, 2001) and numerous other factors (Watkins, 1984; Logan, 1990; Jacobi, 1991; Keef, 1992; Minnaert & Janssen, 1992) are likely to influence students' success at university. The fact that so

many factors can be important is probably the main reason that single measures based on previous academic success, particularly at school, are not strong predictors of success at university. Multiple measures, used in combination, can be more predictive than each of the measures used individually (Solomon, Vancouver, Reinhardt & Haf, 1989), but even this approach has limited potential when all the predictors are pre-enrolment measures (i.e. measures of characteristics or achievements that occur prior to the student commencing the course in which success is being predicted). Killen (1994) suggested that no matter how carefully they are constructed, school matriculation examinations or special university entrance examinations are not likely to be strong predictors of success at university because they do not measure non-intellective factors that are related to many of the important influences on success that students encounter after they enrol at university. Given the complexity of the problem, it seems unlikely that there is much value in trying to find simple pre-enrolment predictors of success at university. Rather, it might be more useful to focus on post-enrolment factors.

Studies that have taken this approach have identified a limited number of factors that appear to have a strong influence on academic success. For example, Killen (1994) concluded that some of the most significant factors in students' academic success at university were interest in the course, motivation, self discipline and effort (none of which can be predicted directly from matriculation results). Student effort was also prominent in students' explanations of success and failure in a study by Schmelzer, Schmelzer, Figler and Brozo (1987). They found that persistent and active study was the most common reason that college students gave for their academic success. Setting appropriate goals, a good study environment, and effective time management were also considered important. Academic failure was attributed primarily to lack of study, poor time management, and inadequate goal setting. It was Tinto (1975:96) who wrote that "(s)ufficiently high commitment to the goal of college completion ... might not lead to dropout from the institution" and "... the lower the individual's commitment to the goal of college completion, the more likely is he to drop out from college". Student self-efficacy also features prominently in attempts to explain student success (e.g. Kleemann, 1994; McKenzie & Schweitzer, 2001).

There is however another variable impacting on the successes and failures of students at university. "Interaction within the college environment" (Tinto, 1975:103) with specific reference to sufficient moral integration and sufficient collective affiliation should be regarded as a very prominent factor influencing the successes of students at tertiary level. Work done by Spady in 1970 suggested that dropout should be treated or viewed in a manner analogous to that of suicide in the wider society (see Tinto, 1975:91). However, Tinto (1975:92) warns that "... a person can conceivably be integrated into the social sphere of the college and still drop out because of insufficient integration into the academic domain of the college (e.g. through poor grade performance".

Many of the studies that have investigated university students' success have taken the approach of measuring factors that were thought to be related to academic success and correlating them with Grade Point Average (GPA) or some other measure of actual success. For example, the study by McKenzie & Schweitzer (2001) investigated 13 such correlations. Another category of studies has investigated lecturers' and students' perceptions of the likelihood that various factors might influence students' academic success (e.g. Killen, 1994). The rationale for such studies is that students' perceptions about what will enhance their chances of success or diminish their chances of failure at university are likely to have a strong influence on the behaviours of students regardless of the actual influence of those factors. This can either help or hinder the student's progress. For example, if students believe that attending lectures contributes to success, they will probably attend regularly and thus increase their chances of being successful. However, if a student believes that success can be achieved

without attending lectures that student will probably not attend lectures on a regular basis. This may diminish their chances of success. Likewise, lecturers' perception of what factors contribute to student success will probably influence their behaviours. For example, if a lecturer believes that attendance at lectures is a requirement for success, that lecturer may provide information in lectures that is not available from any other source, an obvious disadvantage to students who do not attend. Problems such as this will inevitably arise when lecturers' and students' perceptions are incongruent.

This study aims to minimise such problems. The purpose of the study reported in this article was to identify and categorise the post-enrolment factors that lecturers and students see as having important influences on student success at one South African university. Identifying these factors has the potential to be useful in several important ways. First, it can provide a basis for helping students to reflect on their perceptions and expectations of university study so that they can gain more control over their learning and approach university studies in a way that will maximise their chances of success. Second, it can provide a basis for helping lecturers reflect on their expectations of and about students so that they will be better informed about ways in which they can facilitate student learning, enhance the influence of positive factors and minimise the influence of negative factors on student success. Third, the results can be used by university administrators to help them provide a learning environment that will maximise the chances that students will be successful.

### The research sample and methodology applied

#### The selection of the research sample

In an attempt to identify post-enrolment factors that have important influences on students' success at university, 99 students across all years of the Bachelor of Arts, with specialisation in Education, and the BED postgraduate programme, at the University of Pretoria were asked to respond freely to the question: "What five factors or variables related to (a) staff teaching and (b) student learning have, according to you, the most important influence on your academic performance or achievement at university?" A similar question was asked of 61 lecturers in the Faculty of Education. The question was presented in English or Afrikaans according to the language preference of each respondent. The purpose with this initial investigation was mainly to identify and select prominent factors or variables that would eventually be compiled in the questionnaires as explained in the following paragraph.

The responses from the students and lecturers were analysed and placed into categories that emerged as the data were interpreted. These categories were then used to create a set of 52 statements that described factors that might contribute to students' success and a separate set of 55 statements that described factors that might contribute to students' failure. For convenience, these statements were referred to as the "success" and "failure" items on the questionnaires that were subsequently constructed. In these sets of statements, no distinction was made between factors that had originally been identified by students and factors that had originally been identified by lecturers because the aim was simply to make the list of factors as comprehensive as possible. The differences in lecturers' and students' views would be a focus of the second part of the study.

Two parallel-worded questionnaires were developed; one to gather data from students and one to gather data from lecturers. In addition to the "success" and "failure" items, the questionnaires contained items for gathering demographic data — gender, home language and course of study for students; gender, home language and years of teaching experience for lecturers. The student version of the questionnaire were administered to 675 full-time students consisting of 415 (349 female and 66 male) in the first year of the new BED undergraduate programme and 260 (235 female and 25 male) in the final year of the BED (Hons) and PGCE programmes. (These two groups of students are referred to as the first-year students and senior

students, respectively.) The lecturer version of the questionnaire was administered to 38 Lecturers (19 female and 19 male) in the Faculty of Education. The respondents used a five-point Likert-type scale to indicate the extent to which they thought that each factor influenced student success or failure (1 = not at all, 5 = greatly). Because of the large number of students and lecturers selected and who participated in the investigation, the sample was regarded as a normal population and distribution of staff and students representing the Faculty of Education. This was one of the requirements met in deciding to conduct an analysis of variance on the three sets of measurements described in the following paragraph. Bartz (1976:293), Guilford (1956:282) and Minium (1970:367) justify an ANOVA procedure permitting that the variations are collected from normally distributed populations and the samples are drawn at random. The data sets met these requirements and one should take note of Howell's comment that "... substantial departures from normality may, under certain conditions, have remarkably little influence on the final result" (Howell, 1999:303). It was decided not to apply the Kruskal-Wallis H Test to the responses as it was not the researchers' intention to determine whether the independent samples represented the same or different populations (Downie & Heath, 1974:270). However, the Kruskal-Wallis test could have been an alternative measure when taking into consideration that we had been dealing with three different and independent groups (Howell, 1999:405; Mulder, 1989:181).

#### Analysis of variance (ANOVA)

The data were subjected to several forms of analysis to identify similarities and differences in the responses of the three groups of respondents. First, the mean ratings given on each item by lecturers, first-year students and senior students were calculated so that the "success" and "failure" items could be placed in rank order for each group. Next, a univariate analysis of variance (ANOVA) was used to determine whether or not there were significant differences in the mean ratings of each group on each item. The results of these two steps were then used to develop a qualitative description of the similarities and differences.

The methodology of this study was modelled on that used by Killen (1994), but differed from it in several important ways. The first difference was that in the initial phase of the Killen (1994) study students and lecturers had been asked to identify factors that might lead to student success and factors that might lead to student failure (rather than lecture and student factors that might contribute to success). In the Killen study, the questionnaire developed from these free responses contained 40 "success" items and 40 "failure" items. In the second phase of that research, the data came from 392 students across a variety of years of a range of courses (with no differentiation between the responses of junior and senior students) and from 112 lecturers in a range of faculties at an Australian university. Because the present study was restricted to a single faculty, and because the data from junior and senior students was separated, it had the potential to provide additional insights that were not possible in the Killen (1994) study.

#### Research results

The results from the "success" section of the questionnaire are present first, then the results from the "failure" section are discussed, then some overall conclusions are drawn.

##### "Success" questions

On all items on the "success" scale, for both lecturers, first-year students and senior students, the responses covered the full range from 1 (not at all) to 5 (greatly). The mean ratings given by first-year students ranged from 4.47 for "Students interest in the course" to 3.53 for "Availability of university bursaries". The standard deviations of the first-year students' ratings ranged from 0.57 on "Students' interest in the course" to 1.19 on "Availability of university bursaries". The mean ratings given by senior students ranged from 4.53 for "Self moti-

vation" to 3.21 for "Availability of university bursaries". The standard deviations of the senior students' ratings ranged from 0.71 on "Interest in the course" to 1.23 on "Availability of university bursaries". The mean ratings given by lecturers ranged from 4.76 for "Self motivation" to 3.00 for "Availability of university bursaries". The standard deviations of the lecturers' ratings ranged from 0.59 on "Self motivation" to 1.11 on "Well structured presentations by lecturers". These results suggested that the instrument was sufficiently sensitive to the respondents' opinions.

The results of the comparison of the ratings of the three groups (using one-way ANOVA) are summarised in Table 1, and indicate that there was a significant difference ( $p < 0.05$ ) in the ratings of the first-year students and lecturers on 16 of the 52 "success" items; a significant difference ( $p < 0.05$ ) in the ratings of the first-year students and the senior students on 28 of the 52 items, and a significant difference ( $p < 0.05$ ) in the ratings of the senior students and the lecturers on 8 of the 52 items. In each of these three comparisons, the differences were bidirectional with, for example, the lecturers' ratings sometimes being significantly higher and sometimes significantly lower than the students' ratings.

The average ratings of the lecturers, first-year students and senior students were compared in two primary ways. First in terms of the rankings provided by the mean ratings on each item and second in terms of the significance of the differences in the mean ratings on each item. The following paragraphs highlight some of those differences and provide tentative explanations of their underlying causes.

##### Comparison of lecturers' and first-year students' ratings

The first stage of comparison of the lecturers' and first-year students' ratings was a simple correlation of the mean scores on each item. This correlation was 0.754 which suggested a relatively high level of agreement. There were five items that were ranked very differently by the lecturers and first-year students (rankings differing by more than 20 places). They were: "Effective written communications skills" (ranked 14th by lecturers and 41st by first-year students), "The reason for doing a specific course" (ranked 20th and 45th), "Ability to handle stress" (ranked 38th and 16th), "An appropriate balance between academic commitments and social life" (ranked 41st and 18th), and "Family support" (ranked 43rd and 19th).

The second stage of comparison was the ANOVA that examined the differences in the mean ratings on each "success" item. This analysis indicated that there were no items on which the mean rating of the lecturers was significantly higher ( $p < 0.05$ ) than the mean rating of the first-year students. However, there were 16 items on which the mean rating of the lecturers was significantly lower than the mean rating of the first-year students. The 16 items on which the difference between the means of the lecturers' and students' responses was significant fall into two fairly well-defined groups: factors that could be described as student characteristics, skills or actions (such as "self confidence", "interest in the course" and "regular attendance at lectures") and factors that could be seen as external to students and possibly beyond their control (such as "family support" and "availability of quality learning resources"). It should be noted however that within these two broad categories of questions there were also items on which the differences between the lecturers' and first-year students' ratings were not significantly different. Overall, there was considerable agreement between lecturers and first-year students on the importance of the "success" factors on the questionnaire.

##### Comparison of lecturers' and senior students' ratings

The first stage of comparison of the lecturers' and senior students' ratings was a simple correlation of the mean scores on each item. This correlation was 0.822 that suggested a high level of agreement. There were six items that were ranked very differently by the lecturers and senior students (The rankings differed by more than 20 places). They were: "Regular attendance at lectures" (ranked 8th by lecturers and 37th by senior students), "Love and desire of learning" (ranked 15th

**Table 1** Comparison of mean ratings on "success" items from first-year students, senior students and lecturers (sorted by lecturers' ranking)

Questionnaire item	Ranking			Mean			<i>p</i> level ( <i>if</i> < 0.05)		
	Lecturers	1 <sup>st</sup> year students	Senior students	Lecturers (1)	1 <sup>st</sup> year students (2)	Senior students (3)	1-2	1-3	2-3
Self-motivation #	1	8	1	4.76	4.57	4.52			
Self-discipline #	2	4	2	4.61	4.67	4.52			0.0038
Timely and regular examination preparation	3	10	17	4.55	4.53	4.20		0.0096	<0.0001
Student's interest in the course #	4	1	4	4.47	4.74	4.45	0.0230		<0.0001
The desire to learn #	5	9	11	4.47	4.53	4.33			0.0004
Effective study methods #	6	12	10	4.44	4.48	4.33			0.0201
Lecturers who can inspire students #	7	6	14	4.41	4.61	4.27			<0.0001
Regular attendance at lectures #	8	3	37	4.39	4.67	4.06	0.0383	0.0141	<0.0001
Student's attitude towards learning	9	13	12	4.37	4.46	4.30			0.0144
Enthusiastic lecturers/tutors #	10	7	13	4.35	4.60	4.28			<0.0001
Appropriate choice of course of study #	11	22	9	4.34	4.36	4.33			
The desire to acquire more knowledge	12	23	28	4.32	4.35	4.17			0.0048
Interest in the course	13	2	3	4.29	4.68	4.47	0.0005		<0.0001
Effective written communications skills #	14	41	32	4.29	4.08	4.11			
Love and desire of learning #	15	25	36	4.29	4.27	4.07			0.0039
A clear understanding of lecturers' expectations of students #	16	26	19	4.27	4.26	4.20			
A well-structured course #	17	14	5	4.26	4.44	4.38			
Well-structured presentations by lecturers #	18	15	15	4.21	4.44	4.25			0.0054
Regular and comprehensive feedback on progress from lecturers #	19	27	29	4.21	4.24	4.16			
The reason for doing a specific course	20	45	35	4.18	3.99	4.08			
Willingness to accept a challenge #	21	33	27	4.18	4.18	4.17			
Ability to work independently #	22	24	26	4.18	4.37	4.17			0.0183
Encouragement, motivation and support from lecturers #	23	11	33	4.18	4.53	4.10	0.0112		<0.0001
Ability to reason logically #	24	36	39	4.16	4.14	4.04			
Self-confidence #	25	5	7	4.16	4.65	4.37	<0.0001		<0.0001
Willingness to ask for help from lecturers/tutors #	26	21	41	4.16	4.38	3.98			<0.0001
Maturity #	27	38	31	4.13	4.12	4.12			
Clear and informative demarcation of the subject by the lecturer #	28	35	20	4.13	4.14	4.19			
Availability of quality learning resources #	29	20	24	4.11	4.39	4.18	0.0430		0.0016
Study guides containing clearly defined outcomes and sticking to them	30	28	23	4.11	4.24	4.18			
Creative or lateral thinking ability #	31	43	40	4.08	4.01	4.00			
Applicability of course content	32	40	25	4.05	4.12	4.18			
Access to resources such as libraries and internet	33	31	30	4.03	4.21	4.15			
Dedication to a career goal #	34	17	6	4.03	4.42	4.38	0.0021	0.0075	
Assignments that are closely related to the lecture content #	35	46	38	4.03	3.99	4.06			
Implementation of theory into practice	36	37	22	3.97	4.13	4.18			
A stable personal life #	37	29	16	3.97	4.23	4.25			
Ability to manage stress #	38	16	8	3.97	4.23	4.34	0.0011	0.0090	
Consistent effort of learners #	39	34	43	3.97	4.14	3.95			0.0033
Regular use of the library #	40	48	50	3.95	3.70	3.58		0.0406	
An appropriate balance between academic commitments and social life #	41	18	21	3.92	4.42	4.18	0.0004		0.0004
Continuous assessment	42	47	47	3.87	3.74	3.76			
Family support #	43	19	18	3.82	4.40	4.20	<0.0001	0.0125	0.0054
Effective examination techniques #	44	32	34	3.78	4.19	4.08	0.0044		0.0395
Financial security #	45	44	44	3.70	4.01	3.85			0.0300
General academic ability #	46	50	49	3.66	3.37	3.67			
Willingness to accept university procedures and requirements #	47	42	46	3.63	4.02	3.80	0.0078		0.0016
Satisfactory accommodation #	48	39	45	3.58	4.12	3.83	0.0008		<0.0001
Positive influence of friends	49	30	42	3.53	4.23	3.97	<0.0001	0.0063	0.0004
Support by peer group #	50	51	48	3.39	3.67	3.73		0.0479	
The ability to work as part of a group	51	49	51	3.13	3.69	3.42	0.0007		0.0006
Availability of university bursaries	52	52	52	3.00	3.53	3.21	0.0099		0.0008

# Indicates a similar item was used in the Australian research of Killen (1994).

**Table 2** Comparison of mean ratings on "failure" items from first-year students, senior students and lecturers (sorted by lecturers' ranking)

Questionnaire item	Ranking			Mean			<i>p</i> level ( <i>if</i> < 0.05)		
	Lecturers	1 <sup>st</sup> year students	Senior students	Lecturers (1)	1 <sup>st</sup> year students (2)	Senior students (3)	1-2	1-3	2-3
Inadequate or poor exam preparation	1	1	4	4.63	4.50	4.15		0.0019	<0.0001
Lack of self-discipline #	2	4	6	4.58	4.45	4.10		0.0047	<0.0001
Lack of self-motivation #	3	6	3	4.53	4.36	4.16		0.0310	0.0088
Lack of persistence #	4	10	17	4.53	4.31	4.03		0.0032	0.0003
Insufficient effort (e.g. study, exam prep) #	5	8	13	4.50	4.36	4.06		0.0057	<0.0001
Inefficient time management #	6	29	28	4.48	4.23	3.95		0.0020	0.0002
Irregular attendance at lectures/tutorials #	7	3	48	4.42	4.46	3.62		<0.0001	<0.0001
Poor study techniques #	8	19	32	4.42	4.27	3.93		0.0027	<0.0001
Inability to distinguish between important and unimportant information	9	11	23	4.34	4.29	3.98		0.0229	<0.0001
Failure to understand the depth of understanding required at tertiary level #	10	43	33	4.27	4.12	3.90		0.0230	0.0003
Poor literacy skills of students #	11	45	41	4.27	4.08	3.80		0.0146	0.0005
Inability to make use of higher order thinking skills	12	39	34	4.27	4.15	3.87		0.0236	0.0002
Laziness or apathy #	13	38	44	4.18	4.16	3.72		0.0147	<0.0001
Poor examination techniques #	14	5	18	4.13	4.38	4.03			<0.0001
Too many extra mural interests #	15	52	55	4.13	3.91	3.49		0.0005	<0.0001
Lack of interest in the course content #	16	13	31	4.13	4.18	3.93			<0.0001
Lack of provision of a bridge between theory and practice	17	28	7	4.11	4.24	4.10			
Lack of insight into the field of study	18	50	30	4.08	4.01	3.93			
Low self esteem	19	41	42	4.08	4.13	3.78			<0.0001
Late submission of assignments #	20	32	46	4.08	4.20	3.68		0.0262	<0.0001
Inability to balance study and social commitments #	21	16	39	4.05	4.27	3.82			<0.0001
Badly structured presentations by lecturers #	22	7	5	4.05	4.36	4.13	0.0499		0.0015
Failure to approach lecturers/tutors for help #	23	24	52	4.00	4.25	3.58		1.0150	<0.0001
A perceived lack of relevance of course content #	24	48	10	3.97	4.03	4.09			
Lack of self assessment	25	46	43	3.97	4.08	3.77			<0.0001
Lack of confidence #	26	22	40	3.95	4.26	3.82			<0.0001
Lecturers/tutors who does not understand the students' needs #	27	15	15	3.89	4.27	4.03	0.0220		0.0021
Inability to cope with stress #	28	17	26	3.89	4.27	3.96	0.0284		0.0001
Boring presentations by lecturers #	29	2	1	3.89	4.49	4.28	0.0001	0.0159	0.0031
Lack of academic ability #	30	53	54	3.89	3.90	3.52		0.0297	<0.0001
Lack of a clear career goal #	31	36	22	3.87	4.18	3.98	0.0406		0.0057
Poor language abilities of lecturers	32	9	9	3.87	4.34	4.10	0.0047		0.0017
Low input from lecturers in the motivation of students and minimisation of anxiety	33	26	35	3.84	4.25	3.87	0.0123		<0.0001
Changes made to schedules without the consent of all participants	34	25	19	3.76	4.25	4.02	0.0028		0.0022
Too much reliance on directions/guidance by lecturers #	35	53	51	3.76	3.89	3.58			0.0001
Unclear criteria and lecturers' expectations of assignments #	36	18	2	3.76	4.27	4.25	0.0011	0.0020	
Too many demands on students' time (work, travel, study, family) #	37	14	11	3.74	4.28	4.08	0.0041	0.0444	0.0153
Misinterpretation of course requirements #	38	20	16	3.71	4.27	4.03	0.0006		0.0017
Inappropriate and biased assessment procedures used by lecturers #	39	27	8	3.71	4.25	4.10	0.0012	1.0198	0.0499
Lack of maturity #	40	51	49	3.71	4.00	3.60			<0.0001
An attitude where the lecturer is expected to train the students in preparation for examinations	41	49	50	3.68	4.02	3.59			<0.0001
Personal or family crisis #	42	30	21	3.66	4.21	3.98	0.0015		0.0052
Inadequate distribution of schedules	43	42	27	3.61	4.13	3.95	0.0015	0.0373	0.0240
Financial problems and stress #	44	44	36	3.61	4.09	3.86	0.0047		0.0045
Heavy course workload #	45	37	20	3.58	4.18	4.00	0.0003	0.0144	0.0174
Fear of failure #	46	35	47	3.58	4.20	3.67	0.0005		<0.0001
Lack of rewards for student efforts #	47	40	37	3.57	4.13	3.86	0.0009		0.0006
Part-time jobs held by full-time students #	48	55	53	3.55	3.74	3.54			0.0268
Lack of personal interest in students by lecturers/tutors #	49	23	38	3.53	4.26	3.84	<0.0001		<0.0001
Uncertainty about where the content fits into the course	50	33	12	3.45	4.20	4.07	<0.0001	0.0002	
Textbooks available in one language only	51	21	29	3.42	4.26	3.95	<0.0001	0.0062	0.0003
A lecturer who doesn't work according to the outcomes in the study guide	52	31	14	3.39	4.21	4.06	<0.0001	<0.0001	0.0495
Inadequate university library facilities #	53	47	45	3.36	4.03	3.72	0.0004		0.0004
Lecturers who regard the student only as being lazy	54	12	25	3.34	4.29	3.96	<0.0001	0.0006	<0.0001
Lecturers/tutors with unrealistically high expectations of students #	55	34	24	3.29	4.20	3.97	<0.0001	<0.0001	0.0052

# Indicates a similar item was used in the Australian research of Killen (1994).

and 36th), "Dedication to a career goal" (ranked 34th and 6th), "A stable personal life" (ranked 37th and 16th), "Ability to manage stress" (ranked 38th and 8th), Family support" (ranked 43rd and 18th).

The second stage of comparison was the ANOVA that examined the differences in the mean ratings on each "success" item. This analysis indicated that there were three items on which the mean rating of the lecturers was significantly higher ( $p < 0.05$ ) than the mean rating of the senior students, and five items on which the mean rating of the lecturers was significantly lower than the mean rating of the senior students.

#### Comparison of first-year students' and senior students' ratings

The first stage of comparison of the first-year students' and senior students' ratings was a simple correlation of the mean scores on each item. This correlation was 0.847 that suggested a very high level of agreement. There were only three items that were ranked very differently by the first-year students and senior students (rankings differing by more than 20 places). They were: "Regular attendance at lectures" (ranked 3rd by first-year students and 37th by senior students), "Encouragement, motivation and support from lecturers" (ranked 11th and 33rd) and "Willingness to ask for help from lecturers" (ranked 21st and 41st).

The second stage of comparison was the ANOVA that examined the differences in the mean ratings on each "success" item. This analysis indicated that there were 28 items on which the mean rating of the first-year students was significantly higher ( $p < 0.05$ ) than the mean rating of the senior students, and no items on which the mean rating of the first-year students was significantly lower than the mean rating of the senior students.

Overall, these results suggest that there was a high level of agreement between lecturers and students about the factors that could potentially contribute to students' "success". However, the differences in ratings of the first-year and senior students suggest that students' experiences at university were having some influence on their perceptions. This issue is discussed in greater detail later in this article.

#### "Failure" questions

On all items on the "failure" scale, for both lecturers and students, the responses covered the full range from 1 (not at all) to 5 (greatly). The item rated most highly (most likely to contribute to student failure) by both lecturers and first-year students was "Inadequate or poor examination preparation" (mean 4.63 for lectures and 4.50 for first-year students). The item rated highest by senior students was "Boring presentations by lecturers" (mean of 4.28). The item rated lowest (least likely to contribute to student failure) by the lecturers was "Lecturers with unrealistically high expectations of students" (mean 3.29), by first-year students was "Part-time jobs held by full-time students" (mean 3.74) and by the senior students was "Too many extra mural interests" (mean 3.49). For the lecturers' responses, the standard deviations ranged from 0.59 ("Inadequate or poor examination preparation"), to 1.23 ("Boring presentations by lecturers"). For first-year students' responses, the standard deviations ranged from 0.78 (on "Inadequate or poor examination preparation") to 1.06 (on "Too many extra mural interests"). For senior students' responses, the standard deviations ranged from 0.94 (on "Unclear criteria and lecturers' expectations of assignments") to 1.24 (on "Part-time jobs held by full-time students"). Again, these results suggest that the instrument was sufficiently sensitive to the respondents' opinions.

The average ratings of the lecturers, first-year students and senior students were compared in two primary ways. First in terms of the rankings provided by the mean ratings on each item and second in terms of the significance of the differences in the mean ratings on each item. The results of the comparison of the ratings of the three groups (using one-way ANOVA) are summarised in Table 2, and indicate that there was a significant difference ( $p < 0.05$ ) in the ratings of the first-year students and lecturers on 25 of the 55 "failure" items; a significant difference ( $p < 0.05$ ) in the ratings of the first-year students and

the Senior students on 50 of the 55 items, and a significant difference ( $p < 0.05$ ) in the ratings of the senior students and the lecturers on 28 of the 55 items. The differences were bidirectional with, for example, the lecturers' ratings sometimes being significantly higher and sometimes significantly lower than the students' ratings.

#### Comparison of lecturers' and first-year students' ratings

The first stage of comparison of the lecturers' and first-year students' ratings was a simple correlation of the ranking of the "failure" items derived from the mean scores on each item. This correlation was 0.355 that suggested a low level of agreement. This low level of correlation reflects the fact that there were 19 items that were ranked very differently by the lecturers and first-year students (rankings differing by more than 20 places).

The second stage of comparison was the ANOVA that examined the differences in the mean ratings on each "failure" item. This analysis indicated that there were no items on which the mean rating of the lecturers was significantly higher ( $p < 0.05$ ) than the mean rating of the first-year students. However, there were 25 items on which the mean rating of the lecturers was significantly lower than the mean rating of the First-year students. Overall, there was considerable disagreement between lecturers and students on the importance of the "failure" factors on the questionnaire.

With the exception of six items ("Financial problems and stress", "Personal or family crisis", "Lack of a clear career goal", "Inability to cope with stress", "Misinterpretation of course requirements" and "Fear of failure") the 25 items on which the difference between the means of the first-year students' and lecturers' response was significant fall into two categories that could be labelled students' perceptions of their lecturers and students perceptions of their learning environment. Broadly speaking, this suggests that first-year students are more inclined than lecturers to attribute "failure" to factors that are directly or closely within the control of lecturers. If these perceptions are accurate, they point towards problems that need to be addressed by lectures (e.g. by making course requirements more clear). If the perceptions are inaccurate, then it is important to establish why students are inappropriately attributing "failure" to the actions of lecturers.

#### Comparison of lecturers' and senior students' ratings

The first stage of comparison of the lecturers' and senior students' ratings was a simple correlation of the ranking of the "failure" items derived from the mean scores on each item. This correlation was 0.132 that suggested a very low level of agreement. There were 28 items that were ranked very differently by the lecturers and senior students (rankings differing by more than 20 places).

The second stage of comparison was the ANOVA that examined the differences in the mean ratings on each "failure" item. This analysis indicated that there were 17 items on which the mean rating of the lecturers was significantly higher ( $p < 0.05$ ) than the mean rating of the senior students, and 11 items on which the mean rating of the lecturers was significantly lower than the mean rating of the senior students.

All of the items that lecturers rated significantly higher than senior students fall into a category that could be labelled student characteristics or behaviours. All the items that lecturers rated significantly lower than senior students fall into two categories that could be labelled students' perceptions of their lecturers and students perceptions of their learning environment. It is clear that the lecturers are tending to blame the students for "failure" and the senior students are tending to blame the lecturers.

#### Comparison of first-year students' and senior students' ratings

The first stage of comparison of the first-year students' and senior students' ratings was a simple correlation of the ranking of the "success" items derived from the mean scores on each item. This correlation was 0.632 which suggested a moderate level of agreement. There were only seven items that were ranked very differently by the

first-year students and senior students (rankings differing by more than 20 places). They were: "Irregular attendance at lectures" (ranked 3rd by first-year students and 48th by senior students), "Lack of a provision of a bridge between theory and practice" (ranked 28th and 7th), "Lack of insight into the field of study" (ranked 50th and 30th), "Inability to balance study and social commitments" (ranked 16th and 39th), "Failure to approach lectures/tutors for help" (ranked 24th and 52nd), "A perceived lack of relevance of course content" (ranked 48th and 10th) and "Uncertainty about where the content fits into the course" (ranked 33rd and 12th).

The second stage of comparison was the ANOVA that examined the differences in the mean ratings on each "failure" item. This analysis indicated that there were 50 of the 55 items on which the mean rating of the first-year students was significantly higher ( $p < 0.05$ ) than the mean rating of the senior students, and no items on which the mean rating of the first-year students was significantly lower than the mean rating of the senior students.

Overall, these results suggest that there was a high level of disagreement between lecturers and students about the factors that could potentially contribute to students "failure". However, the differences in perceptions of the first-year and senior students seem to be the most important because they suggest that students' experiences at university were having an important influence on their perceptions of what might contribute to "failure". This issue is discussed in greater detail later in this article.

## Discussion

### Locus of control

Because university students are expected by lecturers to be independent learners, to be successful they need to be able to operate with what Mischel (1973) refers to as effective "self-regulatory systems and plans". To achieve this, they must be able to balance their needs for affiliation with their needs for achievement, they must have a strong feeling of self-efficacy, and they must be able to appreciate the complexity of the situations they encounter. Further, they must have a strong sense of purpose and derive some enjoyment from academic activities. It appears from the current study that many students do not have this type of effective self-regulatory system. Rather, they tend to see themselves operating in an environment that is regulated largely by others. This may be attributable to their prior educational experiences since there is little evidence that the school system in which most of these students had been successful had placed much importance on self-efficacy, independent decision-making and self-regulation (Jackson & Young, 1987; De Villiers & Rwigena, 1998).

The differences in lecturers' and students' ratings of the factors which contribute to student failure reveal quite clearly a difference in perception of the amount of control that students have over their success, and a difference in perception about the responsibility that lecturers have for student success. Weiner's (1979, 1986) achievement-motivation theory provides one plausible explanation of why students' perceived control over their success and failure may be different from that of lecturers. When students experience failure (or lack of success) the ensuing causal attribution can be classified according to locus (internal, external), to stability (stable, unstable), and to control (controllable, uncontrollable). According to Weiner, the attributions accorded to a particular event determine its influence on subsequent academic outcomes including expectations, affect, perceived control and behaviour. If a failure is attributed to a personal, stable cause (such as lack of ability) this will result in lower motivation and a feeling of less control than when a failure can be attributed to a personal, variable cause (such as lack of effort) or to an external cause (such as the lecturer). From this point of view, the tendency of students in this study (particularly senior students) to attribute success to their own efforts and failure to their lecturers is consistent with their efforts to maintain self-esteem.

### Lecture attendance

Schmelzer *et al.* (1987) suggested that certain student behaviours en-

sure failure (not attending class, not taking notes, not reading assignments) but other behaviours only improve the chances of success (attending class, taking notes, reading assignments). They also suggested that this difference in "certainty" made the factors contributing to failure easier to identify than the factors contributing to success. It seems from the present study that lecturers and students differ in their views about the certainty that some behaviours will lead to failure and about the extent to which other behaviours will improve chances of success. Their disparate views on the importance of attending lectures illustrate this point. First-year students saw regular attendance as highly likely to lead to success (mean rating of 4.46). This is to be expected because of the compulsory nature of school attendance and the school examinations in which they were asked to reproduce things they had been told in class. Parents may also have influenced the opinions of first-year students by suggesting that they should attend all required classes. Quite understandably, lecturers also rated attendance highly (but significantly lower than first-year students). Their high rating may have been because they see lectures as an opportunity for them to pass on the knowledge that will be tested in examinations.

However, senior students placed very little importance on attending lectures. They rated "regular attendance at lectures" significantly lower than lecturers and first-year students, with a result that they ranked it 37th on the list of factors contributing to success (compared with a ranking of 8th by lecturers and 3rd by first-year students). Similarly, senior students rated "irregular attendance at lectures" significantly lower than lecturers and first-year students, placing it 48th on their rankings of factors contributing to failure (compared with it being placed 7th by lecturers and 3rd by first-year students). It would appear that experience has taught the senior students that regular attendance at lectures contributed little to their likelihood of success and irregular attendance contributed even less to the likelihood that they would fail. For this to be the case, they must have experienced at least a moderate level of success despite not attending lectures. One simple explanation for this is that they believed that examinations and other assessment tasks on which they had been successful had emphasised reproduction of information from textbooks. They may not have experienced lectures that, in their view, added significantly to the knowledge that they could gain by reading. If there is any truth in this line of argument, it should be of concern for the lecturers. It may well indicate that lecturers are giving too little attention in their assessment tasks to the importance of critical thinking and the exploration of ideas, and that these ways of approaching content are not being modelled in lectures. Anecdotal evidence to support this view comes from the authors' recent attempts to introduce innovative forms of assessment at the university at which this research was conducted. Second-year students became quite concerned that assessment would not be based on assignments and examinations that required them to simply reproduce information from the textbook (despite the fact that the assessment criteria were provided in advance and in much greater detail than they had experienced in the past).

### Examinations

Both the "success" and "failure" results reflect the strong South African emphasis on examinations. Lecturers rated "Timely and regular examination preparation" third highest of the "success" items and "Inadequate or poor exam preparation" as the most likely contributor to "failure". There was strong agreement on these points from the first-year students whose ratings placed these items tenth and first, respectively, on the "success" and "failure" rankings. The ratings of senior students placed these items seventeenth and fourth, respectively, a possible indication that many of them had experienced success without "timely and regular examination preparation" but lack of success because of "inadequate or poor examination preparation". That is, they had been able to achieve success in examinations through adequate preparation that was not necessarily regular. Interestingly, these items did not appear in the Australian study by Killen (1994) as neither lecturers nor students mentioned examination preparation in the original Australian survey. This is not surprising because at the

university where the Australian data were gathered there is a heavy use of progressive assessment and only very moderate use of examinations.

Interestingly, "effective examination techniques" are seen to be less important than "examination preparation", being ranked 44th, 32nd and 34th, respectively, by the lecturers, first-year students and senior students on the "success" scale. However, "poor examination techniques" were ranked 14th, 5th and 18th, respectively, on the "failure" scale. Effective examination techniques seem to be viewed as something that might help, whereas poor examination techniques are seen as a distinct disadvantage.

### Self-discipline

There was strong agreement on the importance of "self discipline" as a factor contributing to success (ranked 2nd, 4th and 2nd by the lecturers, first-year students and senior students, respectively) and of "lack of self discipline as a factor contributing to failure (ranked 2nd, 4th and 6th by the lecturers, first-year students and senior students, respectively). As might be expected because of the similarities in the concepts, there was also strong agreement on the importance of "self motivation" as a factor contributing to success (ranked 1st, 8th and 1st by the lecturers, first-year students and senior students, respectively) and of "lack of self motivation" as a factor contributing to failure (ranked 3rd, 6th and 3rd by the lecturers, first-year students and senior students, respectively).

### General observations

In some instances, the rankings of apparently closely related variables on the success and failure sections of the questionnaire produced seemingly inconsistent results. For example, "interest in the course" as a factor contributing to success was ranked 4th, 1st and 4th, respectively by the lecturers, first-year students and senior students, but "lack of interest in the course content" was ranked 16th, 13th and 31st, respectively, by the lecturers, first-year students and senior students. This might simply mean that while all groups of respondents considered that interest in the course was highly likely to lead to success, they were acknowledging that a lack of interest was a less significant contributor to failure than other factors (such as poor exam preparation).

There were a few items on which the responses of the first-year students and senior students were very similar, but were significantly different from the responses of lecturers. These could potentially be the most important findings of the study because they indicate that even though the differences in opinions (between lecturers and students) exist when students enter university, they persist throughout the students' undergraduate study. This could signify an important communications breakdown — lecturers may be unaware of factors that students consider to be reasonably important. On the "success" scale, these items were "Dedication to a career goal" (ranked 37th by lecturers, 17th by first-year students and 6th by senior students) and "Ability to manage stress" (ranked 38th by lecturers, 16th by first-year students and 8th by senior students). On the "failure" scale the results are more revealing. The two items on which the students' views remained significantly different from the lecturers' views were "Unclear criteria and lecturers' expectations of assignments" and "Uncertainty about where the content fits into the course". If lecturers do not make assessment criteria clear and if they do not make explicit efforts to explain the relevance of content, there is little that students can do to change this situation. Interestingly, these are two factors that feature prominently in the literature on effective teaching in general and Productive Pedagogy in particular (Luke *et al.*, 1998).

It is interesting that there is a greater level of agreement about factors that have the potential to lead to success than there is about factors that have the potential to lead to failure. Perhaps this is because the students had experienced a high level of success (relative to their peers) in order to gain entry to university, and many of the factors that led to that success also have the potential to lead to success at uni-

versity. To some extent, factors on which there was strong agreement, such as "self-motivation", "willingness to accept a challenge" and "access to resources" would be expected to contribute to success in almost any academic endeavour. However, many of the factors on which there was strong disagreement (particularly between lecturers and first-year students) may not have been experienced by students prior to attending university. Examples of such factors could be "lecturers with high expectations", "lack of personal interest in students by lecturers" and "too many demands on students' time".

### Conclusions

The comparison of the lecturers' and students' opinions of the importance of various factors in contributing to student success or failure at university can be viewed in two ways: the similarities in their responses suggest common understanding, and the differences suggest disparate views of what it takes to be successful in academic study. In the present study, some of these similarities and differences seem to have arisen for reasons that have not been addressed in earlier literature. One of these previously unexplored issues is a consideration of the implications of success being defined by implicit and explicit factors that are contradictory. This point calls for explanation. "Academic success" is usually taken to mean that students are able to meet the assessment requirements of the programme in which they enrol; if these requirements can be met in minimum time that represents greater success than if subjects have to be repeated. From a student's point of view, this is likely to mean that there are a range of different requirements that need to be met in order to be successful across the different courses in a programme — the requirements will differ because of the nature of what is being studied in different courses and because of variations in the "standards" used by different lecturers. Some of the requirements and standards will be explicit and some will be implied. For example, the explicit criteria might be essentially quantitative (how long an essay needs to be, what issues need to be addressed, how referencing is to be done) but the implied criteria might be qualitative (essentially concerned with how well the student argues a case, how clearly ideas are expressed, and so on). Such explicit and implicit criteria may lead to students developing inappropriate views of what they need to do to be successful in their studies.

The results of this study provide some confirmation of the findings of Talbot (1990) that "students resort to explanations based on effort and ability to explain their academic persistence and achievement" (p.55) and that "the single most influential personality traits (in relation to academic persistence and achievement) appear to be intrinsic motivation and the student's level of cognitive categorisation (attributional complexity)" (p.57). Talbot suggests that students who see things in shades of grey rather than in black and white appear to be able to make better use of their time and feedback from lecturers and, therefore, are more likely to persist and to succeed. Although the current study made no attempt to relate students' attributions of success and failure to their actual academic performance, the fact that so many of the students attributed failure to external sources suggests that further investigations in this area might be fruitful.

Student effort was also prominent in students' explanations of success and failure in a study by Schmelzer, Schmelzer, Figler and Brozo (1987). They found that persistent and active study was the most common reason that college students gave for their academic success. Setting appropriate goals, a good study environment, and effective time management were also considered important. Academic failure was attributed primarily to lack of study, poor time management, and inadequate goal setting. The results of the first phase of the current research are consistent with those findings. The second phase of the current study supported another of the Schmelzer *et al.* findings, namely, that "students were more likely to attribute the cause to the instructor when they failed than when they succeeded" (p.264). This was particularly evident in the tendency for the senior students to attribute potential failure to factors controlled by lecturers.

Some people (e.g. Schmelzer *et al.*, 1987) argue that the respon-



sibility for success rests entirely with students and that "they need to acquire those skills ... that will allow them to succeed even when they encounter poor instruction or an unsupportive professor" (p.265). This is not a view that the authors of this article support. Nor is this view consistent with the basic principles of outcomes-based education that require teachers to have "high expectations" for all learners and to provide "expanded learning opportunities" to maximise the success of all learners (Spady, 1994; Killen, 2002). We believe that students and lecturers have a joint responsibility for student success and that the first stage in accepting this responsibility is for both students and lecturers to gain a better understanding of the complex processes that influence student success and failure. The current study is another step towards that goal, but much more needs to be learned before each student can be assisted to achieve to his or her full potential.

This study has the long-term purpose of improving the success rates of students. The first step in this process will be to provide students with a simple means of reflecting on their perceptions and expectations of university study so that they can maximise their chances of success. Concurrently, lecturers will be encouraged to reflect on their expectations of and about students. Through these processes, students can gain more control over their learning, and lecturers can be better informed about ways in which they can enhance student learning.

Caution must be exercised in attempting to generalise the results of this study to other contexts, or indeed to all students and lecturers at the university at which the data were gathered, even though the results support findings from several earlier studies. It must be acknowledged that this research was based on lecturers' and students' perceptions of factors that contribute to students' success and failure at university and not on the measurement of actual performance. However, this study does highlight the dangers inherent in assuming that, because students have survived twelve years at school and somehow managed to gain entry to university, they are equipped to deal with the competing academic, social, cultural, economic and personal pressures that they must balance in order to succeed in their studies. It is not unreasonable to suggest that the provision of an effective educational programme relies, in part, on both the providers and receivers of that programme being adequately aware of the factors that are likely to influence the success and failure of students in that program. The research reported here suggests that many university students and lecturers have quite diverse opinions about what these factors might be, and about their relative importance. These differences in perceptions make problematic many of the assumptions about teaching and learning at university that lecturers and students hold. When taking Tinto's Longitudinal Model for Dropout into consideration, one has to agree with the author that "the process of dropout from college can be viewed as a longitudinal process of interactions between the individual and the academic and social systems of the college ..." (Tinto, 1975:94).

It appears as if there are two issues that could comprehensively assist us in getting a better picture of the variables impacting on the performance of students at higher institutions. From the student's point of view "a better understanding of the mechanisms and functions of the institution" would contribute to their success in the institutions and programmes of choice. From lecturers' point of view assisting students to become "fully integrated in the social structures of the university" would be an asset worth pursuing in our search of a more effective and progressive learning environment.

A better understanding of the factors or variables that would motivate students to engage persistently with their studies might also hold the key towards improved student performance at institutions of higher learning.

Future research will attempt to link students' expectations about factors influencing their success with their actual performance. This will provide an opportunity to explore numerous issues that surfaced in this study. One such issue is the influence of peers on students' success. The first phase of the present study identified "Support by

peer group" as a factor that could contribute positively to success. However, in phase two of the study this item was ranked 50th by lecturers, 51st by first-year students and 48th by senior students, a clear indication that it was not considered very important. In contrast, several studies reported by Gainen (1995) indicate the very strong effect that peer groups/cultures can have on student success, particularly the success of students from minority groups.

A further issue to be explored in future research is the extent to which students' experiences at university (and the congruence between their expectations and experiences) influence their decisions to persist with, or abandon, their studies. Research of this type could bring together two streams of research that currently seem to be running in parallel — research into students' expectations about university study and research into students' commitment to academic success (Branxton, Bray & Berger, 2000).

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