Learning approaches, personality and concepts of knowledge of first-year students: Mature-age versus school leaver

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Abstract

There is considerable interest in how students study and what skills best facilitate their academic performance. This paper reports on some of the key outcomes of a large individual differences study of student learning profiles at a regional Australian university. It examines how students' conceptions of knowledge, approaches to learning, and personality relate to academic success measured using grade point average (GPA). A total of 1078 students, 706 mature-age and 372 school leaver students, completed an online survey during their first semester of study at the University of Southern Queensland. The data were summarised using multivariate techniques (e.g., correlation and regression analyses) and first-year student profiles were built using standard descriptive statistics. Univariate analyses showed that mature-age students obtained higher GPAs and scored higher on the Deep and Strategic learning approaches than did school leavers. Conversely, school leavers scored higher on the Surface approach to learning. Regression analyses indicated that the Strategic approach positively predicted GPA. Intellect and Conscientiousness were each found to positively predict the Deep approach to learning; Conscientiousness was found to positively predict the Strategic approach to learning; and Emotional Stability and Intellect were each found to negatively predict the Surface approach to learning. These findings provide implications for curriculum design and delivery and for transition programs for both school leaver and mature-age students.

Introduction

The nature of students participating in university study is changing. Today's commencing cohorts enter the tertiary environment with a broad range of learning preferences and perceptions shaped by their diverse cultural backgrounds and past experiences (Taylor & Mander, 2007; Zapalska & Dabb, 2002). Classes often consist of a mix of school leavers, who are members of the 'net generation', and increasing numbers of mature-age students, from a diversity of educational and

work-based backgrounds embracing higher education. Developing teaching and learning strategies to cater for the diversity of students' backgrounds is made more complex by the flexibility of the study modes and levels of participation they choose to undertake. This is exacerbated by the fact that many full-time students spend significantly less time on-campus than in the past as they balance work and study.

The first year at university is crucial for most students as it can often lay the platform for future academic success. All commencing students go through a period of transition as they adjust to the challenges thrown up by new learning and social experiences (Lawrence, 2005; Palmer, O'Kane, & Owens, 2009; Tinto, 2008). Not all are able to meet these new challenges and many end up leaving university due to "adjustment or environmental factors rather than intellectual difficulties" (Pitkethly & Prosser, 2001, p. 186). It is therefore not surprising that considerable research has been devoted to identifying those factors that influence success at university and to developing strategies to smooth the transition experience for students (Burton & Dowling, 2005; McKenzie, Gow, & Schweitzer; 2004; Robbins, Lauver, Le, Davis, & Langley, 2004). Students are under pressure to succeed and universities continue to recognise the need to increase retention rates.

Individual differences factors thought to influence student transition to higher education include students' perceptions and attitudes towards the course, self confidence (McKenzie et al., 2004), learning approaches, and personality (Duff, Boyle, Dunleavy, & Ferguson, 2004), among others. Krause, Hartley, James, and McInnis (2005) likewise found that many first-year on-campus students in Australia were not fully prepared for tertiary education, were uncertain about what was expected of them, and were not motivated to achieve in their studies (cf. McInnis, James, & Hartley, 2000). Conceptions of knowledge have also been recognised as a potential predictor of academic success (Cantwell & Scevak, 2004). University administrators and academics need to better understand how such factors might impact student learning to determine how best to cater for today's diverse student cohorts and maximise students' chances of academic success. In an era where many universities offer students more flexibility than ever before, it is imperative that they become acquainted with their own learning approaches and understand how to study effectively so they can manage that flexibility and make informed choices. This is particularly important for students who study off-campus by either distance or online modes as they must "become masters of their own learning" (Zimmerman, 1990, p. 4).

It should be noted that the majority of past research on the first-year student experience tends to relate to students who study full-time on-campus and this study aims to redress this imbalance. This paper builds on previous research by investigating the nature of the relationship between approaches to learning, personality, and conceptions of knowledge in a large sample of undergraduate students enrolled either on-campus, via distance education, or online. Additionally, it examines the extent to which these individual difference variables each predict academic success as measured by GPA at the end of their first year of tertiary study.

Approaches to learning

Researchers have long been interested in how students go about learning, what strategies they use, and why they choose particular approaches (Vermunt, 2007).

Approaches to learning reflect the individual differences in strategies used to achieve a particular learning task (Diseth, 2003). The student approach to learning (SAL) tradition distinguishes between Deep, Surface, and Strategic learning approaches (see Entwistle & Peterson, 2004 for a review). A Deep approach involves finding meaning in what is being studied to maximise understanding. A Surface approach involves investing little time in the academic task and memorising information with rote-learning. A Strategic approach involves being guided by the assessment criteria and enhancing self-esteem through competition.

Researchers have investigated the relationships between these three learning approaches and academic success. The SAL paradigm argues that high achievement can be predicted by a Deep approach, either alone or in combination with a Strategic approach (Diseth, 2003; Diseth, Pallesen, Hovland, & Larsen, 2006). In contrast, low achievement can be predicted by a Surface approach to learning (Biggs, 1999; Diseth, 2003). Indeed, the Surface learning approach has consistently been found to negatively correlate with academic success (Boyle, Duffy, & Dunleavy, 2003; Diseth, 2003).

School leavers versus mature-age students

The influence of the demographic variable age on student success is also of interest (cf. Duff et al., 2004). Researchers have classified students into (a) traditional and non-traditional (Bowl, 2001); (b) mature-age, those aged 21 and over on March 1 of the year of tertiary entry, and younger (Leder & Forgasz, 2004); and (c) recent school leavers and nonschool leavers (Zeegers, 2001). This study used the variable *school* (*school leavers* versus *mature-age students*) to examine how age influences academic achievement. School leavers were defined as having accessed higher education within a year of completing high school; mature-age students delayed their tertiary enrolment more than one year after completing high school and were typically aged 21 and over (cf. Zeegers).

Previous research has shown that mature-age students favour the Deep approach (Duff et al., 2004; Gijbels, Van de Watering, Dochy, & Van den Bossche, 2005) and school leavers prefer the Surface approach (Richardson & Newby, 2006). Mature-age students tend to be more successful academically than school leavers (McKenzie & Gow, 2004). For example, Wilding and Andrews (2006) found that mature-age ($\beta = 0.12$) and the Strategic learning approach ($\beta = 0.22$) each predicted the average mark in 612 first-year students from a university in London.

Duff et al. (2004) examined the relationships between personality, learning approaches, and academic success in a sample of 146 social science undergraduate students. Duff et al. performed a linear regression analysis, with age, prior academic success, and Conscientiousness as independent variables, accounting for 24.1% of the variance in academic achievement. Their findings indicated that age ($\beta = 3.55$) and personality (i.e., Conscientiousness, $\beta = 2.43$), together with prior academic success, predicted grade point average (GPA).

Few studies have investigated how the variables *school*, *personality*, and *approaches to learning* combine to predict academic success. This study aims to redress this imbalance by examining the relationships between these key variables in a large sample of mature-age and school leaver students.

Personality

Despite the continued debate about the exact number of factors comprising personality, most research has favoured use of a five-factor model (Goldberg, 1999): Emotional Stability, Extraversion, Intellect, Conscientiousness, and Agreeableness. Each factor is bipolar. People who score low on the trait Emotional Stability tend to experience such negative feelings as anxiety, embarrassment, and low self-esteem. Individuals high on Extraversion trait tend to be social and assertive. The Intellect trait, also known as Openness to Experience, is characterised by an open-mind and a willingness to experience novel situations. Individuals high on the Agreeableness trait are altruistic, adaptable, and cooperative. Conscientiousness is characterised as being responsible, hardworking, and dependable.

Previous research has shown that three of the five personality traits positively predict academic success, although the findings have been mixed (Diseth et al., 2006). Conscientiousness is the trait most consistently positively correlated with academic performance (Diseth, 2003; Nguyen, Allen, & Fraccastoro, 2005). Intellect has also been positively associated with academic success in undergraduate studies (Burton & Nelson, 2006). Introverted students are expected to outperform extraverts (Entwistle & McCune, 2004); however, findings are inconsistent. In contrast, Neuroticism and Agreeableness are generally not associated with academic success (Diseth et al.).

Conceptions of knowledge

The terms conceptions of knowledge and epistemological beliefs are interchangeable (Hofer & Pintrich, 1997). Personal epistemology "examines what individuals believe about how knowing occurs, what counts as knowledge and where it resides, and how knowledge is constructed and evaluated" (Hofer, 2004, p. 1). Students' conceptions of knowledge are thought to develop progressively through their educational experiences (Perry, 1970, as cited in Hofer & Pintrich). According to Perry, a student will progress through the stages by first thinking that knowledge is certain and absolute and finally to a point where they accept that knowledge is constructed by an individual and is not absolute. At this point they may show a readiness to make a personal stand on issues. This process occurs while accepting that all knowledge and ideas are ultimately relative. Perry acknowledged that some students can remain stagnate for long periods and that many students only reach the final position of making a commitment to a personal perspective at the end of their degrees.

Schommer (1990) extended this work, defining conceptions of knowledge as a system of independent beliefs that have the potential to influence comprehension and learning. Schommer identified four beliefs: (a) Simple Knowledge, in which knowledge is characterised as isolated facts; (b) Certain Knowledge, where knowledge is absolute; (c) Innate Ability, where ability to learn is inherent; and (d) Quick Learning, where learning is quick or not-at-all. Schommer showed that the more students believed in Quick Learning, the more likely they were to oversimplify conclusions and achieve less academic success. Thus, Quick Learning is related to the Surface learning approach, which in turn, negatively predicts academic performance (Cano, 2005; Dahl, Bals, & Turi, 2005). Further, Schommer found that experienced university students are more likely to write tentative conclusions than first-year students. Simarly, Schommer-Aikens and Hutter (2002)

showed that graduate students typically believe in complexity and tentative knowledge, and are therefore likely to take on multiple perspectives.

Research aims

The main aim of this study was to investigate the relationships between approaches to learning, personality, conceptions of knowledge, and GPA in a cohort of first-year undergraduate students. It was hypothesised that mature-age students would score significantly higher than school leavers on the Deep approach; school leavers would score significantly higher than mature-age students on the Surface approach. The Deep and Strategic approaches were each expected to positively predict GPA and the Surface approach was expected to negatively predict GPA. The traits Conscientiousness and Intellect were each expected to positively predict GPA. Based on previous research, Conscientiousness and Intellect were each expected to positively predict the Deep approach; Conscientiousness was also expected to positively predict the Strategic approach; Emotional Stability and Intellect were each expected to negatively predict the Surface approach. It was further hypothesised that mature-age students would achieve significantly higher GPAs than school leavers in the current sample. This study also examined the relationships between conceptions of knowledge and learning approaches. It was hypothesised that Quick Learning beliefs would be positively related to the Surface learning approach, and that Innate Ability would be positively related to the Deep and Strategic learning approaches.

Method

Participants

A total of 1089 first-year students at the University of Southern Queensland (USQ) participated in the survey (response rate = 29.9%); however, only 1078 students (response rate = 29.6%) had complete data for analysis. The sample comprised 250 (23.2%) males and 828 (76.8%) females, showing an over-representation in the proportion of female students to male students; however, this reflects the dominance of female students in Psychology and Nursing disciplines at USQ. Students from each of the five University's faculties participated: 155 Arts, 180 Business, 120 Education, 79 Engineering and Surveying, and 553 Sciences (primarily Psychology, Nursing, and Midwifery degrees). Participants' ages ranged from 15 to 68 years, with a mean age of 28.6 years ($SD = 10.59$). A total of 474 (43.9%) students were studying on-campus; 537 students (49.9%) were distance students, and 67 (6.2%) were studying online, showing an over-representation in the proportion of on-campus students to distance students. The majority of the 372 school leavers were on-campus students (79.4%) while the majority of the 706 mature-age students were distance students (76.1%).

Measures

A self-report survey was developed for use in a longitudinal study of individual differences in student achievement. Only those measures relevant to the current research aims are discussed here.

Approaches to learning

The 52-item Approaches and Study Skills Inventory for Students was used to measure the three approaches to learning adopted by students (Entwistle & McCune, 2004). Participants indicate their relative agreement with statements by using a 5-point Likert-type scale, ranging from 1 (*disagree*) to 5 (*agree*). The Deep approach scale contains four, four-item subscales (seeking meaning, relating ideas, use of evidence, and interest in ideas). The Surface approach scale includes four, four-item subscales (lack of purpose, unrelated memorising, syllabus boundness, and fear of failure). Total scale scores for both the Deep and Surface learning approaches could theoretically range between 16 and 80. The Strategic approach scale consists of five, four-item subscales (organised study, time management, alertness to assessment demands, and monitoring effectiveness). Total scale scores could theoretically range between 20 and 100. Entwistle and McCune reported acceptable reliabilities for the Deep ($\alpha = .84$), Strategic ($\alpha = .80$), and Surface ($\alpha = .87$) scales.

Personality traits

The short form of the International Personality Item Pool (IPIP, Goldberg, 1999) was used to measure the Big-Five factors of personality: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Intellect. The IPIP consists of 50 questions, with 10 items used to compute a total score for each major personality trait. Respondents used a 5-point Likert-type scale to rate each statement, ranging from 1 (*very inaccurate*) to 5 (*very accurate*). Total scores for each personality trait could theoretically range between 10 and 50. Goldberg showed that the IPIP scales each demonstrated acceptable internal reliabilities, with coefficient alpha estimates ranging between .79 (Conscientiousness) and .87 (Extraversion). The IPIP scales show acceptable reliability estimates when administered online (cf. Burton & Nelson, 2006).

Conceptions of knowledge

The Understanding of Knowledge questionnaire (Schommer, 1990) was used to measures the beliefs students adopt regarding knowledge and learning: Quick Learning, Innate Ability, Simple Knowledge, and Certain Knowledge. Participants rated the 44 items using a 5-point Likert scale (1 = *strongly disagree;* 5 = *strongly agree*). Innate Ability scores theoretically ranged from 13 to 65; Simple Knowledge scores ranged from 16 to 80; Quick Learning ranged between 7 and 35; and Certain Knowledge scores ranged between 8 and 40. The instrument has acceptable internal consistency ($\alpha = .74$; Schommer).

Academic success

The current study used GPA as the measure of academic success. GPA is a standardised measure of overall academic performance across all courses completed by the student (Zeegers, 2001). Aggregating marks over several courses leads to a more reliable criterion of academic success which in turn, results in higher correlations with measures of approaches to learning and personality (Paunonen & Ashton, 2001). A 7-point grading scale is used at USQ.

Procedure

USQ Ethics clearance was obtained prior to the commencement of the study. The current data were collected on-line, with students consenting to having their academic performance tracked over time. The total testing time for the Internet-administered survey was about 1.5 hours. Testing was carried out over a 4-month

period in the first semester of students' first year of studies. Personalised feedback was provided to each participant, summarising their learning approaches and major personality traits, and outlining strategies for optimising individual learning environments. Electronic copies of the survey were kept in a secure place, with each student's identity remaining confidential, being only available to the principal investigators.

Results and discussion

Key findings

Table 1 shows the means and standard deviations for key variables for both mature-age and school leaver cohorts. The key findings are summarised here. The average GPA for the student sample ($M = 4.84$, $SD = 1.37$) is slightly lower than a Credit (B), which is '5' on the 7-point scale. The average GPA for school leavers was lower than that obtained for mature-age students. A t-test[1] showed this difference to be statistically significant, $t(1076) = 2.686$, $p = .002$, Eta$^2 = .01$, with a small effect size evident.

The descriptive statistics observed for the three approaches to learning are consistent with previous research (cf. Burton & Nelson, 2006). The mature-age students scored higher than school leavers on both the Deep, $F(1, 1076) = 23.15$, $p = .001$, Eta$^2 = .02$, $f = .15$, and the Strategic, $F(1, 1076) = 17.21$, $p = .001$, Eta$^2 = .02$, $f = .13$, approaches respectively, showing moderate effect sizes. Conversely, school leavers scored higher than mature-age students on the Surface approach, $F(1, 1076) = 46.38$, $p = .001$, Eta$^2 = .04$, $f = .20$, showing a medium effect.

Both school leavers and mature-age students scored highest, on average, on the personality trait Agreeableness and lowest, on average, on the personality trait Emotional Stability. These findings replicate the findings of Burton and Ropolo (2008).

For the conceptions of knowledge variables, total scale scores are comparable with those observed by others (cf. Burton & Sztaroszta, 2007; Schommer-Aikens & Hutter, 2002). Alphas ranged between .60 and .91, indicating satisfactory internal consistency.

Table 1: *Summary statistics for mature-age and school leaver students*

Measure	Mature-age (N = 706)		School leaver (N = 372)	
	M	*SD*	*M*	*SD*
Academic Success				
GPAS207	4.92	1.42	4.69	1.26
Conceptions of Knowledge				
Innate Ability	28.55	4.28	30.17	4.26
Simple Knowledge	40.43	4.54	41.82	4.60
Quick Learning	16.30	3.60	17.31	3.66

Certain Knowledge	18.82	3.49	19.77	3.63
Approaches to Learning				
Deep	63.73	8.06	61.36	8.40
Strategic	75.74	12.00	72.80	12.26
Surface	44.48	10.30	49.16	9.83
Personality				
Extraversion	31.33	8.21	32.40	7.99
Agreeableness	41.53	5.18	39.94	5.72
Conscientiousness	36.56	6.44	32.98	6.23
Emotional Stability	31.20	8.22	29.17	7.47
Intellect	36.05	5.91	35.22	6.47

Pearson's product moment correlations were computed for all key variables, as shown in Table 2. An alpha level of .05 was used for all statistical analyses. The key relationships are summarised below.

As expected, the Deep and Strategic approaches each correlated significantly with GPA; the Surface approach was significantly negatively correlated with GPA. As expected, Conscientiousness correlated significantly with GPA. Contrary to expectations, however, Intellect did not correlate significantly with GPA. Another unexpected finding was the significant relationship between the Agreeableness trait and GPA. All four conceptions of knowledge variables correlated negatively with GPA.

As expected, the Deep approach correlated positively with the traits Conscientiousness and Intellect; the Deep approach was also significantly correlated with Agreeableness. As expected, the Strategic approach was significantly correlated with Conscientiousness. The Surface approach correlated negatively with both Emotional Stability and Intellect. As hypothesised, Quick Learning beliefs were related to the Surface learning approach. The Simple Knowledge variable showed a similar moderate to strong correlation with the Surface learning approach.

A series of regressions were then performed to further investigate the relationships between approaches to learning, personality, conceptions of knowledge, and academic success. In the following analyses, all results that relate to individual predictors within a multiple regression model reflect the significance of the unique contribution of the predictor within that model. A test of the complete model was beyond the scope of this paper.

Table 2: *Correlation matrix: GPA, conceptions of knowledge, approaches to learning, and personality*

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. GPA	1.0												
2. Innate Ability	-.08**	1.0											
3. Simple Knowledge	-.14**	.29**	1.0										
4. Quick Learning	-.17**	.45**	.40**	1.0									
5. Certain Knowledge	-.16**	.30**	.40**	.40**	1.0								
6. Deep Approach	.13**	-.27**	-.34**	-.22**	-.25**	1.0							
7. Strategic Approach	.23**	-.22**	-.19**	-.17**	-.05	.53**	1.0						
8. Surface Approach	-.17**	.27**	.43**	.40**	.29**	-.29**	-.28**	1.0					
9. Extraversion	-.06	-.07*	-.09**	-.08**	-.07*	.08**	.08*	-.15**	1.0				
10. Agreeableness	.10**	-.35**	-.21**	-.30**	-.28**	.20**	.12**	-.20**	.20**	1.0			
11. Conscientiousness	.22**	-.22**	-.11**	-.20**	-.10**	.18**	.49**	-.29**	.01	.23**	1.0		
12. Emotional Stability	.03	-.07*	-.16**	-.12**	.00	.09**	.14**	-.42**	.22**	.01	.18**	1.0	
13. Intellect	.05	-.23**	-.37**	-.22**	-.31**	.43**	.11**	-.35**	.28**	.29**	.08**	.07*	1.0

*Note. * p < .05; ** p < .01.*

First, each of the three learning approaches was regressed onto the four conceptions of knowledge variables, The result indicated that Quick Learning (ß = .21, $p < .05$) and Simple Knowledge (ß = .30, $p < .05$) were significant positive predictors of the Surface approach, $R^2 = .24$, $F(4, 1073) = 84.12$, $p = .001$, $f^2 = .32$. Further, Simple Knowledge (ß = -.26, $p < .05$), Innate Ability (ß = -.17, $p < .05$), and Certain Knowledge (ß = -.10, $p < .05$) were all significant negative predictors of the Deep approach, $R^2 = .17$, $F(4, 1073) = 56.21$, $p = .001$, $f^2 = .20$. Innate Ability (ß = -.16, $p < .05$) was a significant negative predictor of the Strategic approach, $R^2 = .08$, $F(4, 1073) = 22.95$, $p = .001$, $f^2 = .09$.

Second, the three approaches to learning were each regressed onto the five personality traits. As expected, both Conscientiousness, $\beta = .12$, $p = .001$, and Intellect, $\beta = .41$, $p = .001$, positively predicted the Deep approach, $R^2 = .22$, $F(5, 1072) = 61.22$, $p = .001$, $f^2 = .28$. This finding implies that students who are open-minded and imaginative are more likely to find meaning in their study materials. Further, as expected, Conscientiousness, $\beta = .49$, $p = .001$, positively predicted the Strategic approach, $R^2 = .26$, $F(5, 1072) = 75.32$, $p = .001$, $f^2 = .35$. Thus, students who are responsible and able to manage the challenges associated with tertiary study are more likely to monitor their study effectiveness and develop a keen alertness to the assessment requirements. Emotional Stability, $\beta = -.37$, $p = .001$, and Intellect, $\beta = -.30$, $p = .001$, each negatively predicted the Surface approach, $R^2 = .32$, $F(5, 1072) = 100.03$, $p = .001$, $f^2 = .47$. Individuals scoring low on Emotional Stability tend to manifest anxiety and are easily stressed; those scoring low on Intellect are typically conventional and conservative and prefer straightforward things. It is therefore not surprising that people with these characteristics favour surface learning – they reproduce content to cope with course requirements.

Third, GPA was regressed onto the three approaches to learning, $R^2 = .07$, $F(3, 1074) = 26.29$, $p = .002$, $f^2 = .08$. The result indicated that the Strategic approach positively predicted GPA, $\beta = .22$, $p = .001$; the Surface approach negatively predicted GPA, $\beta = -.11$, $p = .001$. This finding indicates that students who focus on pieces of information in an atomistic way are less likely to achieve academic success.

Conceptions of knowledge and approaches to learning

Consistent with previous research, Quick Learning significantly predicted the Surface approach (cf. Cano, 2005). The current data indicate that Simple Knowledge is also a significant positive predictor of the Surface approach. These findings imply that students with strong beliefs in knowledge as being absolute and isolated, and learning as being instinctive and fast, are likely to adopt a Surface approach to learning. Such students will typically study without reflecting on either purpose or strategy, and treat information as unrelated bits of knowledge. The current results further indicate that first-year students show a strong tendency to believe that knowledge is certain (cf. Schommer, 1990).

The negative relationships between Innate Ability and the Deep and Strategic learning approaches is contrary to expectations. This finding implies that first-year university students are still in the process of becoming familiar with course requirements and are yet to take a personal perspective on knowledge. It further suggests that many students might not have used either Deep and Strategic approaches prior to their commencing higher education and they are uncertain of how to modify their learning approaches to accommodate their changed learning environments. It would therefore be worthwhile to track how students' behaviours and knowledge beliefs change over time to determine if experience or confidence

mediates academic performance. This study provides a useful starting point for future research designed to examine the relationship between conceptions of knowledge and academic success.

Personality and approaches to learning

A key finding of this study is that certain personality traits predict learning approaches. Intellect was a significant predictor for the Deep approach to learning. This finding replicates previous research (Diseth, 2003; Duff et al., 2004) and indicates that students who are open to learning experiences are likely to seek meaning and understanding in the concepts they are studying. As expected, Conscientiousness was a good predictor for the Strategic learning approach. Conscientious individuals are characterised as organised, purposeful, and strong-willed (Zhang, 2003). It is therefore not surprising that students who score high on this trait have the motive to be alert to assessment requirements and to monitor their study efforts. This finding extends upon research that has previously used samples of on-campus students only (Diseth). Finally, Emotional Stability was a good negative predictor for the Surface approach to learning, replicating previous research (Diseth; Duff et al.). Thus, students who are emotionally unstable tend to avoid the challenges associated with tertiary study by reproducing what they have been taught to meet the minimum requirements (Zhang).

Approaches to learning and academic success

The expected correlations between the Strategic and Surface approaches to learning and academic success (GPA) were found with the current sample of first-year students. Academic success was positively related to the Strategic learning approach; GPA was negatively related to the Surface learning approach. Thus, students who intended to achieve high grades were successful; those who tended to reproduce the learning material were not successful. These results support previous findings (cf. Boyle et al., 2003) and indicate that those students who were content to memorise the material only and who lacked purpose in their academic pursuits were not successful in their first year of studies. This finding may be attributed, in part, to the flexible learning environments provided for these first-year students. It makes substantive sense that such students may require additional time and assistance to adapt to the expectations and requirements of tertiary study, including distance education in most instances. Further research is warranted. The academic progress of these students should be tracked and monitored to establish key predictors of academic success over time. To this end, multiple criterions of academic success should be used to establish the extent to which the learning strategies that students adopt are course specific.

Contrary to expectations, however, the Deep learning approach was not a significant predictor of academic success. Previous research indicates that a Deep approach may be more likely to predict academic success in the latter years of a degree, when assessment procedures directly reward a demonstration of conceptual understanding (Diseth, 2003). Further research is warranted to investigate the extent to which Deep approaches are beneficial to students across the different levels of study.

Academic success: mature-age versus school leaver

A key finding of this study is that mature-age students obtained significantly higher GPAs than did school leavers. Further, mature-age students scored higher than school leavers on the Conscientiousness trait. These findings indicate that mature-age students are typically conscientious and responsible, efficient, self-disciplined

and organised, and have high aspirations for academic success. Additionally, mature-age students scored higher than school leavers on the Strategic approach. This finding implies that mature-age students intend to do well in the course by organising and planning their study in response to assessment requirements and criteria; they manage time and effort effectively. As expected, Conscientiousness predicted the Strategic approach to learning. Further, the Strategic approach predicted GPA, in line with previous research. Thus, students who adopt the Strategic approach intend to succeed and are motivated to obtain the best possible mark by effectively organising their study time and learning environments.

Another key finding of this study is that mature-age students scored higher than school leavers on the Deep approach. This suggests that mature-age students are better able to relate ideas and use evidence, are more meaning-oriented in their studies, and are more interested in understanding the subject matter than are school leavers (cf. Entwistle & Peterson, 2004). Conversely, school leavers scored higher on the Surface approach suggesting that they are more syllabus bound and use more unrelated memorising in their learning (Entwistle & Peterson). Consistent with previous research, both Intellect and Conscientiousness predicted the Deep approach. Conscientious people are determined and strong-willed; individuals scoring high in Intellect are imaginative and perceptive. It is therefore not surprising that people with such characteristics aim to understand what they learn and relate new concepts to ideas already assimilated, indicative of deep learning.

Further research is currently underway to examine the extent to which study mode (e.g., distance versus on-campus) impacts academic success, both for school leavers and mature-age students.

Implications for student learning

For some years now tertiary educators have been tackling the learning and teaching issues raised by increasing student diversity. The preliminary results of this study indicate the significant effect that some individual characteristics play in student performance, specifically the academic success of commencing students.

To avoid responding superficially to the diverse characteristics of the student population, tertiary educators will themselves need a deep understanding of the factors that influence learning (Pitkethly & Prosser, 2001). This requires providing learning experiences that respect and value the diverse backgrounds, abilities, skills, and learning preferences of their students (McKenzie et al., 2004). An inclusive learning environment that values the diverse perspectives of its commencing student cohort may make the difference between success and failure (Venter, 2003). The challenge, then, is how to provide that environment, particularly when the course is offered in multiple modes of delivery.

The research data indicated that the majority of first-year students who adopt a Strategic learning approach are confident learners who have the ability to self-manage their learning environments and experience academic success. Thus, the learning environments of such students may be enhanced by encouraging them to employ behaviours that facilitate both Deep and Strategic approaches. For example, provide all students with the opportunity to practise new skills and to explore new ideas in ways best suited to their individual learning preferences. They can be encouraged to link, reflect, and seek meaning in the concepts being studied. This will assist students in developing the Strategic elements necessary to facilitate achievement of course objectives while also encouraging the development of a

Deep learning approach. Adopting a Strategic learning approach is especially relevant given the challenge for students to better manage their study time with other work and family commitments.

This study extends previous research by showing that first-year students with weak concepts of knowledge are more likely to adopt a Surface approach to learning. It is therefore vital that appropriate standards and attitudes for learning are set at the foundation level. For example, Taylor (2008) found that the way assessment is structured and the type of feedback provided to students can have a major impact on their performance. This is particularly true in first-year studies, where many students are experiencing academic requirements and assessment processes for the first time. Taylor presents a model of assessment practice for first-year students accompanied by a number of examples which demonstrate these principles. This model breaks first-year assessment into three overlapping stages: (a) assessment for transition, (b) assessment for development, and (c) assessment for achievement. The practices detailed in this model encourage educators to develop assessment that:

- Provides opportunities for students to build the skills they need to succeed early;

- Allows less heavily weighted assessment tasks early in the teaching semester so students can practise their skills; and

- Allocates assessors with ample time for making in the development assessment tasks so that extensive feedback can be provided while students still have time to remedy any concerns.

Conclusion

The current data confirm that certain personality traits are related to, and predictive of, the approaches to learning that first-year students adopt. For instance, significant positive relationships were observed between Intellect and the Deep approach, and between Conscientiousness and the Strategic approach. The expected negative relationship between Emotional Stability and the Surface approach was also found. Further, learning approaches can predict academic success. The Strategic approach positively predicted GPA; the Surface approach negatively predicted GPA. These results reinforce educator's often intuitive understanding of the importance of a Strategic approach to learning. They support the view that educators should encourage all students, including those learning online and via distance education, to develop an active interest in, and engagement with, the subject material. This teaching approach will help to enhance students' conceptual understanding, a key component of the Deep learning approach, and establish the extent to which teachers can help students adapt to their flexible learning environments, understand course requirements, and achieve success.

The current findings contribute to our understanding of key differences between school leavers and mature-age students and the way they approach their studies. The data indicate that mature-age students achieve higher academic success than school leavers and are more likely to use the Deep and the Strategic approaches than are their counterparts. Thus, curricula for first-year students need to ensure school leavers are equipped with self-management and study skills to help them organise their time, make effective learning choices, and to understand their learning materials at a deeper level. School leavers have different needs to mature-age students and structures and processes should be put in place to help all

students, regardless of previous experience or study mode, make a successful transition to university. Academics teaching into the first-year program should look to develop transition programs and curricula that help those students new to tertiary life achieve success.

In conclusion, the knowledge, skills, and experiences that students bring to university, and the foundations laid in their first year, are often crucial to their future success. This means that teachers in today's tertiary education sector face a significant burden in not only conveying discipline content and practices but also setting students on the path to becoming self-directed learners. The challenge is delivering a learning environment that is inclusive and caters for the increasing diversity among student populations. A middle of the road approach is no longer appropriate. Acknowledging diversity is one thing – achieving inclusiveness is another. A key way for teachers to make effective adjustments to their curricula is to better understand exactly what factors make a difference between success and failure for individual students. Acknowledging that different individuals bring different learning approaches and backgrounds to the learning context is the first step in providing a more inclusive learning environment.

Note

- A t-test was run rather than an analysis of variance due to a violation of the assumption of equal variances.

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