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Student skills and the Bradley agenda in Australia

Jennifer Carpenter
Australian Catholic University

Joanne Dearlove
University of Wollongong, dearlove@uow.edu.au

James GT Marland
Australian Catholic University, james.marland@acu.edu.au

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Student skills and the Bradley agenda in Australia

Abstract

This paper investigates the study strategies that first-year Australian university students bring with them to university. The research has currency due to the implementation of the Review of Australian higher education [Bradley, D., Noonan, P., Nugent, H., & Scales, B. (2008). Review of Australian higher education: Final report. Canberra: Australian Government.], which recommended that universities increase the number of students in undergraduate courses. In response to government incentives to increase enrolments, many universities have lowered their entrance scores and, as a result, have attracted students who would not traditionally have been eligible for university entrance. The study employed the Learning and Study Strategies Inventory (LASSI) to investigate the differences in study strategies used by a cohort comprising students from the expanded intake facilitated by the Bradley Review according to their gender, age, socio-economic status and entrance score. While these research results demonstrate a lower than average score on the LASSI instrument for this particular cohort, there were almost no dissimilarities in any of the categories assessed. This paper will argue that the differential distribution of such students across institutions in Australia has potential implications for the institutions themselves and the sector as a whole.

Keywords

agenda, bradley, skills, australia, student

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Student skills and the Bradley agenda in Australia

Authors' Names

Author's Details

This paper investigates the study strategies that first-year Australian university students bring with them to university. The research has currency due to the implementation of the *Review of Australian Higher Education* (Bradley, Noonan, Nugent & Scales, 2008), which recommended that universities increase the number of students in undergraduate courses. In response to government incentives to increase enrolments, many universities have lowered their entrance scores and, as a result, have attracted students who would not traditionally have been eligible for university entrance. The study employed the Learning and Study Strategies Inventory (LASSI) to investigate the differences in study strategies used by a cohort comprising students from the expanded intake facilitated by the Bradley review according to their gender, age, socio-economic status (SES) and entrance score. While these research results demonstrate a lower than average score on the LASSI instrument for this particular cohort, there were almost no dissimilarities in any of the categories assessed. This paper will argue that the differential distribution of such students across institutions in Australia has potential implications for the institutions themselves and the sector as a whole.

Key words: LASSI; study strategies; socio-economic status; Bradley Review; widening participation.

Introduction

Throughout the developed world, including Australia, policies aimed at widening participation in higher education are increasingly being implemented as a means of buttressing national economic security by improving the quality of the national workforce (Yorke, 2006). In Australia, this policy agenda has been driven by the *Review of Higher Education in Australia* (Bradley, Noonan, Nugent & Scales, 2008) or the “Bradley Review” (Bradley et al., 2008) which has set targets adopted by the former Gillard Australian federal government and requires universities to increase their intake of student numbers so that a larger proportion of the population will hold an undergraduate degree by 2020. The policy changes which have flowed from the implementation of the Bradley Review are poised to alter the scope and scale of higher education in Australia considerably, as well as introducing significant new funding and quality assurance mechanisms designed to facilitate those changes in scale.

The present study focuses on the study skills and attitudes brought to university by a cohort of students commencing university in 2012, the first year of operation of the federal policy to increase undergraduate enrolments. Learning and study strategies are among the constellation of factors that assist students to succeed in their university studies (Krause & Coates, 2008). The Learning and Study Strategies Inventory (LASSI), an American instrument employed internationally for evaluating study skills, was used to assess the study capabilities these students brought to their university education. As the LASSI instrument appears not to have been previously used in Australia, the present research will provide a reference point for future comparative studies of Australian undergraduates. Its international use also permits comparisons with cohorts in several other countries (Olaussen & Braten, 1998 [Norway]; Bråten & Olaussen, 2000 [Norway]; Bender & Garner, 2010 [USA]; Downing, Chan, Downing, Kwong & Lam, 2008 [Hong Kong]). This study investigates correlations between students' study skills and the following significant aspects of their educational identity and capital: their gender, age, socio-economic status (SES) and entry scores using the Australian Tertiary Admission Rank (ATARs). The results are discussed in terms of their possible implications for the individual students, institutions and the university sector.

The Australian Context

The Bradley Review and its adoption as government policy in 2009 (Gillard, 2009; Australian Government, 2009), marked a watershed in higher education in Australia (Birrell & Edwards, 2009; Massaro & Martin, 2009; Edwards, 2011). The resulting policy shifts in relation to student intakes, funding mechanisms and quality assurance have the potential to reshape the Australian higher education sector. The core recommendation of the Bradley Review was for a substantial expansion of the higher education sector in Australia to achieve a target of 40% of the population of 25-34 year olds as holders of at least bachelors' degrees in 2020, a rise from a rate of 29% in 2006 (Bradley, Noonan, Nugent & Scales, 2008). The Australian Government has accepted the target proportion of 40%, but has set a later date for achieving the goal, namely 2025 (Gillard, 2009; Australian Government, 2009; Birrell, Rapson & Smith, 2010). The Bradley Review, and the Australian Government's policy response to it, placed great emphasis on increasing the proportion of low-SES students enrolling at university as the key strategy for widening participation in higher education to groups who were previously underrepresented (Bradley, et al., 2008; Australian Government,

2009); this goal has been broadly commended (e.g. Massaro & Martin, 2009; Putnam & Gill, 2011).

Massaro and Martin (2009) have noted that the targets of the Bradley Review and the Government specify increases in low-SES student enrolments (from 15% of student enrolment to 20%), rather than degree completions; the low-SES students will need to complete their degrees to contribute to the 40% policy objective. Despite the emphasis on this group in the Bradley Review, higher levels of undergraduate enrolment of students from low-SES backgrounds will not be sufficient to achieve the Bradley objective of a 40% proportion of university graduates in the 25-34 age group by 2025. To achieve this goal, participation at university must also be widened to include students with lower levels of academic achievement (lower entry scores), than have previously been admitted to their chosen courses. However, neither the Bradley Review (2008) nor the Australian Government's policy paper *Transforming Australia's Higher Education System* (Australian Government, 2009) explicitly discusses these students with lower entry scores. **And indeed, data for 2012, the first year of the demand-driven enrolment recommended by the Bradley review, indicates significant increases in the offers of university places made to final-year students of all SES backgrounds compared to the offers made in 2011 (percentage increases for low SES, 5.8%, medium SES, 5.7% and high SES, 4.9%). At the same time, the rate at which applicants with entry scores in the lowest band (ATARs of "50.00 or less") were offered undergraduate places increased markedly from 18.2% in 2011 to 24.8% in 2012 (Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education 2012).**

As Edwards (2011) has argued, it is likely that the significant increases in student enrolment which are required by the Bradley Review and to be enabled by the new demand-driven funding arrangements will be unevenly distributed amongst the Australian universities. As a general rule, Edwards argues, the top tier of older, established, research-intensive universities is less likely to grow significantly. On the other hand, the new era brought in by the Bradley Review has led to significant growth in student enrolment at a number of younger, less research-intensive universities.

A consistent theme in analysis of the Bradley Review and its implementation has been the challenge of funding greater academic support for non-traditional students whom the Review seeks to encourage into university education (Massaro & Martin, 2009; Putnam & Gill, 2011; Edwards, 2011). Changing to university funding based on completions rather than enrolments, combined with the increased costs of educating some cohorts may have

different effects on universities depending on the nature of their cohorts. This situation has raised concerns for academics and administrators; teaching faculty are often concerned about how to foster student success in a group of students who may be in general less well-prepared for university study than previous undergraduate cohorts while university administrations are often concerned with the funding implications of non-completion rates (Krause, 2012).

The LASSI

The LASSI (Version One) was developed almost thirty years ago and draws on the field of cognitive psychology. It was revised in 2002 (Version Two) and is a norm-referenced instrument whose norms are based on the scores of 1,092 American students. These students studied at a variety of higher education institutions and were of both sexes and of various ethnicities and ages (Weinstein & Palmer, 2002, p.18). Weinstein and Palmer do not provide any information on the norming sample's year of study. Since the development of the LASSI, scholarship on student success in tertiary study has broadened to reflect a more relational, socially-situated view of student success generally referred to as "student engagement" (Kuh, Cruce, Shoup, Kinzie & Gonyea, 2008; Bryson & Hand, 2007; Trowler, 2010). Student engagement incorporates a constructivist view of learning and acknowledges the responsibilities and agency of both institutions and individuals. There are different types of student engagement (such as peer engagement and academic engagement) and a range of locations in which engagement can take place (such as in class and in social situations). Engagement can be described as occurring along a continuum from inertia, apathy and disillusionment (Krause, 2005), sometimes alternatively described as disengagement or alienation (Mann, 2001), to deeper forms of engagement. The learning and study strategies which are assessed by LASSI belong to that aspect of student engagement which relates to students' agency, specifically, students' willingness to interact with the academic materials and tasks presented to them both in and out of class, and the manner of that interaction. The behavioural and attitudinal approach to student learning is an important but necessarily partial contribution to our understanding of the complex reality of student engagement (which occurs over extended periods of time) and success.

This study examines newly-enrolled students' incoming skills and attitudes using data collected in week two of the participants' first university semester in order to measure their incoming skills and abilities. As Krause and Coates (2008) point out, "[d]eveloping the capacity to manage one's time, study habits and strategies for success as a student is

foundational to success in the first year” (p. 500). The ten scales of learning and study strategies of the LASSI are set out below in Figure 1.

Figure 1. Scale / descriptors for LASSI from Weinstein, Palmer, and Schulte (2002, p. 13).

Scale	Description
ANX	Anxiety and worry about school performance
ATT	Attitude and interest
CON	Concentration and attention to academic tasks
INP	Information processing, acquiring knowledge, and reasoning
MOT	Motivation, diligence, self-discipline, and willingness to work hard
SFT	Self-testing, reviewing, and preparing for classes
SMI	Selecting main ideas and recognizing important information
STA	Use of support techniques and materials
TMT	Use of time management principles for academic tasks
TST	Test strategies and preparing for tests

In the years following the publication of the first and second versions of the LASSI, the Inventory has been the subject of a number of significant independent statistical analyses. These studies have confirmed the Inventory’s reliability and validity, examined its use in cross-cultural settings, and investigated correlations between scores on the Inventory and age, gender and student success (Cano, 2006; Prevatt, Petscher, Proctor, Hurst & Adams, 2006; Flowers, 2003; Bender & Garner, 2010; Ning & Downing, 2010; Melancon, 2002; Yip & Chung, 2005; Ola, Morakinyo & Adewuya, 2009; Olaussen & Braten, 1998; Braten & Olaussen, 1998; Marrs, Sigler & Hayes, 2009; Carson, 2011; Flowers, Bridges & Moore, 2011). Those studies that have used the LASSI outside the American context have demonstrated that the instrument generally retains its value in cross-cultural environments (Olaussen & Braten, 1998). It is also notable that of the LASSI’s ten scales, it appears that the “motivation” subscale is most vulnerable to cross-cultural influence (Braten & Olaussen, 2000); this finding is also still to be tested in an Australian context.

Of particular note is Cano’s (2006) statistical analysis of the LASSI subscales which led him to postulate that three latent constructs lie beneath the LASSI, and that those three constructs do not match the three areas of “skills, will and self-regulation”

which the creators of the LASSI saw as underlying the Inventory (Weinstein, Palmer & Schulte, 2002). “Skills, will and self-regulation” did not in fact emerge as discrete statistical entities in Cano’s study. Cano made the further finding that two of the latent constructs of the LASSI he proposed, namely “Affective Strategies” and “Goal Strategies,” are correlated to a significant level with academic performance (2006). Cano’s research thus confirmed the existing consensus that the LASSI does measure constructs that are related to student success, despite the fact that the exact mechanisms by which the LASSI measures student success remain open to debate. Despite these positive evaluations of LASSI, care is still needed in interpreting the results of the LASSI in this Australian study. As studies investigating the validity of the LASSI in the Australian context have not yet been conducted, this finding cannot be generalised to the Australian situation.

Research Questions

This study aims to answer two research questions: What learning and study skills does a cohort of commencing Australian students in the first year of the expanded enrolments, post-Bradley era bring to their university studies; and how do their study skills and strategies relate to their gender, age, SES and ATAR scores? The study concludes with a consideration of how findings about this cohort contribute to an understanding of the impact of the widening participation agenda and the quality assurance agenda on the Australian higher education sector.

Method

Site

The study was conducted on a Sydney campus of a multi-campus Australian university. The university as a whole offers a broad range of courses but there has been a strong historical specialisation in primary and secondary education on the campus in question. The university is a particularly appropriate site for this study because it has positioned itself as a “Bradley university,” an institution strongly shaped by the new higher education environment created by the Bradley Review’s recommendations.

Participant Group

The participant group for the study was a convenience sample of first-year undergraduate students enrolled in communication and theatre studies units within degrees in Arts and

Education. The students were invited to participate in the survey for the research project in their class groups in week two of their first semester. Week two was chosen to allow evaluation of the learning and study strategies the students brought with them to university, rather than those developed during their undergraduate studies. Of the 140 students approached, 103 returned completed surveys giving a response rate of 73.6%.

Scoring Instruments and Analysis

The survey comprised involved two sections: the 80-item LASSI survey (most recent version – Version Two) and one page of demographic questions. The items were statements to which students responded by completing a five-point Likert scale. A sample copy of the LASSI may be viewed online at the LASSI website (H&H Publishing, 2013). The participants' responses to the LASSI were scored by the researchers and compared with published norms in the literature on the LASSI.

The demographic questions presented to participants requested information about students' age, gender, SES and ATAR. **In line with the findings of current research on the measurement of SES (Bowden & Doughney, 2010; James, 2001), the highest educational qualifications of each participant's parents were used to determine the students' SES.** The ATAR was used as a ranking measure of students' incoming abilities and levels of performance; participants were asked to give their received ATAR (from UAC) if they had gained entry to university on the basis of that measure. The ATAR is a percentile ranking based on secondary school achievement used by all Australian states except Queensland for admission into undergraduate university courses. The highest ATAR awarded is 99.95, and the rankings descend by increments of 0.05 to 0 (Universities Admissions Centre, NSW and ACT, 2012). The study cohort was divided into two groups on the basis of the ATAR supplied: a "higher" group with ATARs of ≥ 75 , and a "lower" group with ATARs of < 65 . The middle group was omitted in order to make clear the potential differences between groups of students with widely divergent ATAR scores. **The research design intentionally separates out low ATAR scores from low SES, and so resists the conflation of the two which is characteristic of the Bradley Review (Bradley et al, 2008, eg. 38).**

Participants' responses to all the demographic questions and their responses to the LASSI items were entered into an Excel database. Correlational analyses (using Pearson's sample correlation coefficient r) were conducted on the basis of age, gender, ATAR and SES for each of the LASSI subscales. Significance was determined at the 0.05 level.

Demographic Features of Participant Group

Gender

Of the 103 students who returned completed surveys, over two-thirds (77.7% n=80) were female and just over one-fifth (21.4% n=22) were male; one student (0.9%) did not answer this question.

Age

Nearly three-quarters of the participant group were aged 19 years or under (17 years: 8.7% n=9; 18 years: 54.4% n=56; 19 years: 11.7% n=12). Just under one-quarter (24.3% n=25) were aged 20 or older, with the oldest recorded age being 48. One student (0.9%) did not answer this question.

Socio-Economic Status (SES)

Of the 103 students who returned a survey, 17.5% (n=18) were classified as having a low SES on the basis that neither parent had attended university or a TAFE college or equivalent. Nearly 38% of students had at least one parent who had studied at only a TAFE college or equivalent (37.9% n=39), 24.3% had at least one parent who had studied only at a university (n=25), and 19.4% had at least one parent who had studied at both university and a TAFE college or equivalent (n=20). Together, these three sub-categories comprise the mid/high SES group, constituting 81.6% of the study cohort (n=84). One student (0.9%) did not answer this question.

ATAR

More than one-third of respondents (36.9% n=38) indicated that their ATAR on entry was “not applicable”. This may be due to a number of factors: early entry into the course where an ATAR was not required; entry via TAFE qualification; entry via relevant industry experience; misunderstanding over the applicability of their ATAR to their entry; or a desire to avoid disclosing an ATAR. A further five respondents (4.9%) left this section blank. Of the remaining respondents, almost two-fifths indicated an entering ATAR between 60.01 and 80 (39.8%, n=41) comprised of: ATAR 60.01-70: 19.4% (n=20); ATAR 70.01-80: 20.4% (n=21). Thirteen (12.6%) respondents entered with ATARs of 60 or less, six (5.8%) respondents entered with ATARs of 80.01 or higher, with one of these recording an ATAR

that exceeded 90. For the purposes of correlational analysis, participants were divided into “higher” (≥ 75 ; $n= 11$) and “lower” ATAR groups (≤ 64 ; $n=24$).

Results

LASSI Scores Compared to Published Norms

The line graph superimposed on the LASSI scoring chart reproduced in Table 1 of the LASSI *Manual* indicates the mean scores of the participant group. In all instances these fall at or below the 50th percentile ranking. This outcome suggests that the participant group’s learning and study skills are relatively weak, judged against the published LASSI norms.

Table 1. Percentile norms provided by the LASSI (Weinstein, Palmer & Shulte 2002, 13) with the participant group's scores superimposed.

Percentiles	ANX	ATT	CON	INP	MOT	SFT	SMI	STA	TMT	TST	Percentiles
99	40	40	40	40	40	40	40	38	40	40	99
95	37	39	37	38	39	36	38	35	37	38	95
90	35	-	35	35	38	33	37	33	35	36	90
85	33	38	34	34	37	31	35	32	33	35	85
80	32	37	33	33	36	30	34	30	32	34	80
75	31	-	32	31	-	29	33	29	31	33	75
70	30	36	31	30	35	28	32	-	30	32	70
65	29	-	30	-	34	27	31	28	29	-	65
60	28	35	29	29	33	26	30	27	28	31	60
55	27	-	-	28	-	-	29	26	27	30	55
50	26	34	28	27	32	25	-	-	-	-	50
45	25	-	27	-	31	24	28	25	26	29	45
40	24	33	26	26	-	23	27	24	25	28	40
35	23	-	25	25	30	22	26	-	24	-	35
30	22	32	24	24	29	-	25	23	23	27	30
25	21	-	23	-	28	21	24	22	22	26	25
20	20	31	22	23	27	20	23	21	21	25	20
15	18	30	21	22	26	19	22	20	20	24	15
10	17	28	19	21	24	17	21	19	18	23	10
5	14	26	17	19	22	15	18	17	16	21	5
1	10	21	13	15	18	12	13	13	12	18	1

The average scores for the participant group, plotted on the LASSI scoring chart above, are detailed below (Table 2.)

Table 2. Mean scores and ranges of the participant group on the LASSI instrument.

Subscale	ANX	ATT	CON	INP	MOT	SFT	SMI	STA	TMT	TST
Mean	24.02	29.66	25.73	27.68	28.81	24.45	28.24	24.46	23.25	27.70
Range	10-37	21-37	13-37	15-38	18-39	12-36	18-38	13-35	9-33	18-35

LASSI Scores Across the Demographic Subgroups

The scores on the ten subscales of the LASSI instrument achieved by the four pairs of subgroups used for analysis in the study (male or female gender; younger or older age; mid/high or low-SES; and higher or lower ATAR) were remarkably uniform. Statistically significant differences between the scores on the ten LASSI subscales of the four pairs of subgroups were found on only five occasions, out of a possible 40 combinations of LASSI subscale and paired demographic subgroup. Independent T-tests were used to establish significance at the level of 0.05. These five significant differences were found between: the scores of males and females on the subscale of anxiety; the scores of younger and older participants on the subscale of attitude and use of support techniques and materials; and the scores of students with mid/high and low SES on the subscales of time management and concentration. These results are discussed below.

Scores by Gender

Table 3. Mean scores of the participant groups on the LASSI instrument by gender.

	ANX	ATT	CON	INP	MOT	SFT	SMI	STA	TMT	TST
Male	26.82	29.85	26.10	27.67	29.19	24.81	28.20	24.52	23.65	27.27
Female	23.19	28.81	24.14	27.64	27.41	22.86	28.60	24.14	21.41	27.80
r	0.02*	0.35	0.10	0.98	0.19	0.22	0.78	0.77	0.17	0.63

(* indicates significance)

Analysis of the participants' LASSI scores by gender revealed a significant difference between the scores of male and female students on only the subscale of anxiety. The LASSI norms are constructed so that higher scores on the anxiety subscale indicate lower levels of anxiety and they assume that lower levels of anxiety are positive indicators for future academic success (Weinstein & Palmer, 2002). As table 3 shows, males in the present study were significantly less anxious about their university performance than females. This result is consistent with the findings of other studies (Braten & Olaussen, 1998; Bender & Garner, 2010). However, it should be noted that even though there is a significant difference between the anxiety scores of the two genders in the study, the mean score on the anxiety subscale for the male participants is still only just within the average range described by the LASSI

norms. This means the male participants are still more anxious than the mean for the norming cohort. Also, the female students are considerably more anxious than the American cohort on which the norms are based (Weinstein, Palmer & Shulte, 2002). There are many possible reasons for the difference in the anxiety levels of the students between the genders and the norm population. Although the anxiety level is associated with gender in the study, it is beyond the scope of this project to determine the reasons for these differences.

Scores on other LASSI subscales showed similarities between genders, a result that is consistent with some studies but at odds with others. Some studies have shown that the “early indicators of future academic distress differ by gender” (Bender & Garner 2010, p. 10) and others have shown relatively consistent differences between the genders in their LASSI profiles. For example, Braten and Olaussen (1998) reported on the higher scores of Norwegian female students, which were significantly different when compared with Norwegian male students on the motivation, time management and study aids subscales. This is in contrast to the present study’s finding that male students scored higher (though not significantly so) than the females on all three of these subscales.

Scores by Age

Table 4. Mean scores of the participant groups on the LASSI instrument by age.

	ANX	ATT	CON	INP	MOT	SFT	SMI	STA	TMT	TST
17-19	23.76	29.13	25.34	27.24	28.84	24.33	28.39	23.66	22.72	27.61
20+	24.8	31.19	26.85	28.96	28.73	24.80	27.77	26.81	24.77	27.96
r	0.46	0.05*	0.18	0.16	0.93	0.73	0.56	0.006*	0.12	0.72

(* indicates significance)

As Table 4 shows, older participants (20 years and older) have significantly higher mean scores on the subscales for attitude and use of support techniques and materials in comparison with younger participants (those aged between 17 and 19). This result contrasts with an international study in Braten and Olaussen (1998) which showed that older students scored higher on the attitude subscale but younger students scored higher on the use of study aids.

The scores on the motivation subscales for the two age groups in this Australian study were surprisingly similar. However, this result may be an artefact of the Inventory itself.

Braten and Olaussen (2000) have proposed that the LASSI instrument measures extrinsic motivation rather than intrinsic motivation. It is possible that the older students are more intrinsically motivated than the younger students and that this type of motivation was not measured by the LASSI, resulting in the similar scores for motivation. However, it should be noted that the attitude score, although higher for the older students, still falls below the average of the LASSI norms and that the score for STA (use of support techniques and materials subscale) only just reaches the average level as defined by the LASSI norms. It is more likely that older entry students have had less recent study experience than younger students and yet their scores on this measure were higher. This raises questions about how well these study strategies are being developed in pre-university educational settings. If this result is confirmed in other studies, this could have implications for the strategies used by institutions to support the “Bradley” students.

Scores by SES

Table 5. Mean scores of the participant groups on the LASSI instrument by SES.

	ANX	ATT	CON	INP	MOT	SFT	SMI	STA	TMT	TST
Mid/High SES	24.14	29.86	26.15	27.57	28.88	24.40	28.79	24.77	23.71	27.96
Low SES	23.24	28.50	23.28	28.28	28.56	24.47	26.11	23.17	20.24	26.56
r	0.63	0.31	0.01*	0.56	0.83	0.96	0.09	0.21	0.04*	0.31

(* indicates significance)

As indicated in Table 5, the mid/high-SES group scored higher than the low-SES group in eight out of ten subscales, although only two of these differences were significant. The two subscales on which the differences were significant were concentration and time management; the mid/high-SES group’s relatively higher scores on these two scales were nevertheless still below the average according to the published LASSI norms. Concentration and time management are aspects of learning that are often not explicitly modelled and practised in secondary schools. These skills may be explained to secondary students by their teachers, but it is normally left to the individual student to apply the information at home without monitoring by or feedback from the school. Parental guidance and modelling may as a result be particularly important to these two areas of academic application. Even the

mid/high-SES group in the cohort studied was not strong in the areas of concentration and time management, and this may be a significant finding for universities considering the most appropriate form of support for students.

Performance by ATAR

Table 6. Mean scores of the participant groups on the LASSI instrument by ATAR.

	ANX	ATT	CON	INP	MOT	SFT	SMI	STA	TMT	TST
≤ 64	23.96	29.78	25.67	27.00	28.42	23.04	28.83	24.17	22.46	28.92
≥ 75	22.18	29.63	26.00	27.82	30.73	26.36	29.82	23.73	21.55	29.82
r	0.48	0.94	0.86	0.56	0.20	0.11	0.50	0.81	0.70	0.54

(There are no significance differences in this table).

As indicated in Table 6, the group of students with higher ATARs (≥ 75) scored higher than their fellow students with lower ATARs (≤ 64) on six of the LASSI subscales but the differences between the two groups were not significant (or close to being significant) on any of those six scales. The ≤ 64 ATAR group scored higher than the ≥ 75 ATAR group on four sub-scales, again without the differences being significant. Given that none of the differences on the subscale between the ATAR groups are significant and that each group outperforms the other on almost an equal number of occasions, it seems that the differences are highly questionable. The commonality between the lower and higher ATAR entry groups in this study raises questions over the predictive ability of the ATAR, however, further investigation of this trend warrants study. These results suggest that while prior academic achievement is generally considered a predictor of first-year university grades and persistence (Kuh et al., 2008), the ATAR is not necessarily indicative of the study skills that students bring with them to university.

Discussion and Conclusions

This research project has investigated the study skills and strategies of a cohort of Australian undergraduate students beginning their studies in 2012, the first year the Australian Government policy response to the Bradley Review, aimed at widening participation in

tertiary education, came into effect. The project's findings, although preliminary in nature, will serve as a point of reference for future research on the impact and consequences of the Australian Government's policy objective of encouraging wider participation in tertiary education in Australia.

The first finding of the study is that the mean scores of the participant group on the Learning and Study Strategies Inventory (LASSI) fell below the 50th percentile ranking for each of the LASSI's ten subscales, indicating areas of "relative weakness" (Weinstein, Palmer & Shulte, 2002, p. 13) across all ten sub-scales assessed by the Inventory. These scores indicate that a considerable number of the participants did not enter university with the kinds of study strategies, skills and attitudes which would assist them in succeeding in their studies, at least when assessed against the LASSI norms derived from responses by American undergraduates.

A second finding is that scores on the ten LASSI subscales achieved by the four paired subgroups within the cohort (male compared with female gender; younger compared with older age; mid/high SES compared with low-SES; and higher ATAR compared with lower ATAR) were remarkably similar to each other. In other words, generally speaking, differences in gender, age, SES and ATAR were not associated with significant differences in study skills, as measured by the LASSI. Of the ten LASSI subscales assessed, significant differences were only found between the scores of males and females on the subscale of anxiety; between the scores of younger and older participants on the subscale of attitude and use of support techniques and materials; and between the scores of students with mid/high and low SES on the subscale of time management and concentration.

The results of the present study suggest that the entire research cohort would benefit from academic support. However, the varied needs of the individual students make it difficult to determine the most efficient way of delivering this support. For example, while it is often the case that students from a low SES achieve lower ATARs than their mid/high SES counterparts (Forsyth & Furlong, 2003 [UK]; McMillan & Western, 2000 [Aust]; Bowden & Doughney, 2010 [Aust]), the difference between low SES and other students in areas tested by LASSI was minimal. Of the eighteen students of low SES in this study, four reported that they had entered with ATARs of 82 or higher. Three of these students scored poorly on the time management subscale, suggesting that student needs are complex and sometimes quite particular. It may therefore not be possible to rely on a simple, single measure by which students can be identified for referral to support services. **Alternative strategies to address the individual and collective student needs indicated in this study might usefully combine**

curricular and co-curricular approaches (Clarke, Kift & Nelson, 2010) with a concurrent emphasis on student self-regulation (for example, Lizzio & Wilson, 2013) to achieve adjustments that depend on action on the part of both students and their universities (Devlin, 2011).

Replication of the findings of the present study would lend weight to the concerns often expressed by faculty staff over the need to support the success of first-year students without strong academic backgrounds. The study's findings may also be cause for anxiety in university administrations, as the new funding mechanisms rely on completion rates. Students who previously may not have been eligible for direct entry to university could find successful completion a significant challenge, and substantial expenditure may be required to enable them to complete their courses. However, as the response to the Bradley Review appears to vary across the Australian higher education sector (Edwards, 2011), the impact on different institutions may also vary. The older, established, research-intensive universities may be less likely to be faced with the sort of cohort described in this study because they are less likely to be admitting educationally disadvantaged students (Edwards, 2011). The younger, less research-intensive universities and those that actively pursue the Bradley initiatives in particular will need to channel funds and effort into meeting the challenges of the Bradley agenda.

The findings of this preliminary study provide groundwork for the future comparative and longitudinal studies necessary for a full understanding of the nature of the expanded Australian undergraduate population and its needs, and demonstrate one general approach to those studies. The findings also provide evidence for the argument that the widening participation agenda as pursued in the Australian context is likely to have a long term impact on the comparability of institutions within the higher education sector and the shape of the sector as a whole. In relation to the present study, the participants cannot be taken to represent the disparate Australian undergraduate population as a whole, though they may stand as a point of comparison for future studies. Further research on the study skills and strategies of commencing undergraduates across the range of Australian universities is now particularly important. Further investigation will also be required to establish the validity of using an American LASSI research instrument to assess an Australian cohort and that enquiry will be the focus of a future study by the present authors.

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