

Assessing the role of digital literacy in English for Academic Purposes university pathway programs

Thomas Roche

SCU College, Southern Cross University, Military Rd, Lismore, 2480, NSW, Australia

Email: thomas.roche@scu.edu.au

(Received 3 August, 2016. Published online 9 May, 2017.)

In the higher education sector, English for Academic Purposes (EAP) programs play an important role preparing an increasing number of international English as Additional Language (EAL) students for university degree programs where English is the medium of instruction. These pathway programs differ in their conceptualisation and operationalisation of EAP, and as a result of which, in their learning outcomes for students. This research aims to develop a better understanding of undergraduate EAL students' ($N = 125$) academic experience at an Australian university through contrasting the experience of students who have gained admission via a university EAP pathway program with an explicit focus on digital literacy practices, with students who entered via an alternate pathway without explicit digital literacy tuition. I explore how embedding digital literacy practices in an EAP program impacts on students' performance in and perception of difficulties in subsequent first-year undergraduate study. The study finds that students who enter via the university's EAP pathway with an explicit digital literacy focus report a better understanding of academic integrity practices and institutional policy, and less difficulty accessing course content. As a result of which, I argue for a reconceptualisation of EAP to include an explicit digital literacy component.

Key Words: English for Academic Purposes, digital literacy, pathway programs, academic integrity, English as Additional Language students, international students.

1. Introduction

With increasing numbers of international English as Additional Language (EAL) users studying in university programs where English is the medium of instruction globally, a growing number of studies have focused on factors which impact international EAL students' academic performance. Research has shown that these students' academic attainment is influenced by a range of factors, including social connections (Evans & Morrison, 2011), cultural adjustment (Andrade, 2006), understanding of and familiarity with the style of teaching (Lee & Greene, 2007), understanding of institutional policy (Roche, Sinha, & Denman, 2015), as well as personal factors including motivation and self-efficacy (Phakiti, Hirsch, & Woodrow, 2013). Much attention has also been dedicated to the relationship between international EAL students' learning outcomes (typically measured in grade point averages (GPAs)) and their level of English language proficiency, with questions raised as to whether these students have the necessary language skills to succeed in higher education and post-study professional life (Birrell, 2006).

An educationally significant positive relationship, albeit sometimes weak or moderate, has been shown to exist between international EAL students' English language proficiency and their overall academic performance in English-medium universities in both English-speaking countries (Elder, Bright, & Bennett, 2007) and in countries where English is considered a second or foreign language (e.g. in Hong Kong, see Evans & Morrison, 2011; in the Sultanate of Oman, see Roche & Harrington, 2013). Student self-report studies also support these findings, indicating that EAL students in English-medium university programs attribute some of their study-related difficulties to their level of academic English (Ramsay, Barker, & Jones, 1999; Robertson, Line, Jones, & Thomas, 2000). It is of note, however, that a number of studies suggest the relationship between academic English and academic achievement is not a straightforward one. For example, a review of the literature by Bayliss and Ingram (2006) describes several studies that did not find a significant relationship between global measures of academic English and academic performance. The reason for finding no or a weak correlation between the variables may lie in several reasons, such as truncated IELTS score ranges in these correlation-based studies (Yixin & Daller, 2007); or that these studies' use of overall IELTS scores as a measure of English may be at issue. Consequently, the construct of academic English language proficiency (ELP), here discussed as English for Academic Purposes (EAP), merits exploration and is explored in the following paper.

Regarding how ELP is constructed, Moore and Harrington (2016) in their paper on how policy makers and practitioners in the higher education sector in Australia view ELP, highlight that academic English is often treated as a separate (sub)element of ELP alongside communicative and professional competency. How these constructs are then operationalised in terms of language development and support varies widely between higher education institutions (Murray & Hicks, 2014). A number of researchers have argued that EAP should be conceptualised in a manner whereby structural aspects of language (e.g. phonological, morphological, lexical, grammatical) are considered as situated within academic contexts, leading to discussions of EAP's relationship with:

- academic literacy and profession-specific communication skills (Murray, 2010),
- academic literacy(ies), including the ability to show discipline-specific knowledge in writing and oral presentations (Arkoudis, Baik & Richardson, 2012),
- discipline-specific discourse features and genre command (Bachman, 1990).

In acknowledgment of the importance of discipline-specific language, some institutions have explored the extent to which EAP pathway programs should be calibrated to match students' target degrees (see Fenton-Smith, Humphreys, Walkinshaw, Michael, & Lobo, 2015). Corpus-based research, however, indicates this may not be necessary, as it has been argued that the impact of discipline on language is less significant than other considerations, such as register or mode (Biber & Conrad, 2009). In contrast to a discipline-specific approach, Miller (2015) argues for incorporating the broader academic context into a reconceptualisation of EAP through a multiliteracies framework including six domains:

Institutional: understanding, navigating and communicating within the university system.

Digital: understanding, using, and communicating with multimedia technology.

Socio-cultural: understanding and relating to people and cultures.

Critical: understanding and manipulating texts, discourses, genres, and practices.

Language: understanding the mechanics of and producing written and spoken texts.

Academic: understanding and producing academic texts, adhering to those conventions.

Such a reconceptualisation of EAP enables higher education and pathway institutions to redefine their programs' aims and goals to focus on a targeted range of university relevant EAP skills, discourses and practices that students need to have an understanding of in order to succeed in higher education. This reconceptualisation also enables those institutions to address EAP issues that research has shown international students struggle with. For example, research

has shown that many students who come to Australian universities via school or undergraduate studies from Asian nations have limited experience with western academic referencing practices (e.g. Chinese students, Flowerdew & Li, 2007; Indian students, Handa & Power, 2005). As Caterall, Aitchison, and Rolls (2016) point out, international students sometimes experience difficulties in higher education in Australia through employing the very academic practices that have previously helped them achieve success in their home country. Repositioning EAP to incorporate literacies related to contemporary academic practice in our institutions has clear implications for EAP pathway programs, their design, teaching delivery, and subsequent learning outcomes. In this paper, I focus on the impact of embedding digital literacy into an Australian university EAP pathway program looking at students' academic performance in, and their self-reported experience of, subsequent undergraduate studies at that university.

2. Digital literacy in university settings

The increasing digitisation of teaching and learning in universities requires students to be digitally literate (Miller, 2015). Which specific skills are required and the degree of mastery of these skills varies greatly from institution to institution (Littlejohn, Beetham, & McGill, 2012). In the following, I provide some examples of digital technologies and concomitant skills needed in the higher education sector, using these as a departure point for exploring the concept of digital literacy.

Learning Management Systems (LMS) have become increasingly common in the higher education sector (Diez-Bedmar & Perez-Paredes, 2012). By the early 2000s, over 95% of higher education institutions in the UK used an LMS (Lonn & Teasley, 2009) and they currently provide the main platform for the integration of learning activities and resources in higher education (Schroeder, Minocha, & Schneider, 2010). From an institutional point of view, an LMS can lower delivery costs while improving access to, and the quality of, the learning environment (Coates, James, & Baldwin, 2005) and create an auditable format for records. Research suggests LMS platforms have been positively received by international students in both the US (Lonn & Teasley, 2009) and Australia (Briguglio & Smith, 2012) where it has been reported that using an LMS makes it easier to access study resources and undertake self-directed study. While LMS are used to present resources to students, they also serve as a platform for a range of digital tools, such as Computer Mediated Communication (CMC) tools, including discussion boards where students are expected to respond to teachers, students and other authors. These CMC tools have been shown to increase social engagement in learning and students' autonomy (Dang & Robertson, 2010). The increased prevalence of these and other technologies in higher education learning contexts necessitates that students are able to engage in learning through these digital tools.

To engage in learning through online technologies, students need more than the Information and Communication Technology (ICT) skills required to power on and drive these digital tools, they need to be digitally literate. Digital literacy has been defined as the ability to find, critically use, and disseminate information via digital tools (see Deakin University: Hagel, 2015); and to do so in a manner within the conventions of a discipline (see Flinders University: Expert Group, 2012). In addition to locating information using digital tools, students also need to be able to analyse and make judgements about the veracity of information in the digital domain. Hinrichsen and Coombs (2014) stress that digital literacy includes more than finding and assessing the reliability of information online, but also involves productive language skills used in CMC in both synchronous (e.g. discussion boards) and asynchronous (e.g. email) modes whereby the pragmatics of language use or "sensitivity to issues of reputation, identity and membership within different digital contexts" must be considered (p. 12). Considering these points, the definition of digital literacy used in the current paper is the ability to access, critically assess, use and create information through digital media in engagement with individuals and communities. Moving our understanding of digital literacy beyond ICT skills and the decoding of information in digital modes to explore relations of authority between authors and readers draws on concepts developed in the field of critical literacy (see Freebody & Luke, 1990; Luke, 2014), emphasising the socially situated nature of all literacy practices.

Today's undergraduates are often considered digital natives, but this does not mean they bring with them university-relevant digital literacy practices¹. There is a growing awareness of the poor transfer of informal ICT skills to formal higher-education learning situations (Littlejohn et al., 2012) and that students fail to critically assess information they find online (Nasah, DaCosta, Kinsell, & Seok, 2010). For example, many university programs use plagiarism detection software, such as Safeassign and Turnitin, and the use of such technology is predicated upon complex notions of text ownership and authorship which can only be understood in terms of socio-cultural relationships (Pennycook, 1996) which are contextually (i.e. institutionally) situated and defined (Chandrasoma, Thompson & Pennycook, 2004). It is also of note these complex notions are acquired through "continued development and refinement in different contexts, not through one-off instruction" (Littlejohn et al., 2012), and as such, students need to be exposed to repeated opportunities for guided practice in order to become digitally literate. The EAP program reported upon in this study aims to develop students' understanding of these social-cultural notions of text authorship and the digital literacy practices associated with these notions at an Australian university.

Given the diverse backgrounds of international EAL students in contemporary university programs, it is important to reconsider EAP curriculum design and teaching to make sure pathway programs equip students with the digital literacy practices that enable success in the higher education sector. The current study uses a mixed methods design with a between-groups quantitative design to explore the relationship between EAL students' perceptions of study difficulties at an Australian university. Specifically, this paper examines if moving beyond language skills to digital literacy practices in an EAP program positively affects students' perception of difficulties and performance in subsequent undergraduate study.

3. The Study

3.1. The context

EAP programs are widely recognised in Australia as enabling international EAL students to develop their English proficiency to meet admissions requirements. Research by Elder and O'Loughlin (2003) and Dyson (2014) shows that students typically achieve an IELTS increase of 0.5 in a 10-12 week EAP program, though Elder and O'Loughlin (2003) qualify this by showing that greater progress may be made in lower proficiency bands, and slower progress between band scores after 6.5. A number of studies have compared the performance of university EAP pathway programs with non-EAP pathway programs. Some of these studies have found that EAP pathway program students' GPAs are generally lower than non-EAP pathway students (Floyd, 2015), but that the difference between the two groups' GPAs lessen after the first semester and suggests that the development of academic skills in EAP programs may help to ultimately equalise the two groups' academic performance. These findings also support the benefits of an increased focus on academic acculturation for all international students.

Southern Cross University (SCU) provides English for Academic Purposes pathways for international EAL students from a range of countries. The EAP program is delivered with 20 hours face-to-face teaching per week and five hours on-line self-study over a ten-week period. The program is delivered across three campus locations using an LMS through which students are taught to and must access resources, upload assessment, use plagiarism detection software, take part in discussion boards, and receive feedback and grades. The teachers on the program all have a recognised undergraduate degree and TESOL qualification.

The SCU EAP program covers language skills typically included in university pathway programs (e.g. reading, writing, speaking and listening) but also moves beyond these to directly

¹ A digital native, or someone born after digital technology was widely embraced, is widely believed to embrace ICT, in particular the use of mobile technologies (e.g. mobile/smart phones and tablets) and social media platforms such as Facebook. However, these skills are not all necessarily transferable to university learning (Ng, 2012).

address what Pennycook describes as “complexities of text, ownership, memorization, and plagiarism” (1996, p. 201). The program does this through analysing a range of academic text types, including digital texts, and investigates the way these are constructed and then employed in academic contexts. Students move from engaging with and critically analysing these texts, to exploring authority and ideology, to producing a range of these text types as assessment items in the EAP program. These text types include an essay, blackboard forums, paraphrasing/referencing tasks, an annotated bibliography and a report. To assist the EAP students acquire an understanding of the socio-cultural values and practices underpinning academic literacy at the university, the staging of these assessment tasks builds on notions of authorship and authority developed in preceding assessment items, giving the students repeated, guided exposure to these concepts and practices.

For example, authorship and authority are first explored through learning activities which aim to make students aware of why and how to critically evaluate the reliability of information in digital resources. The concept of credibility is discussed and explored. Following these explorations, students continue to consider the importance of authorship and authority in CMC activities involving netiquette, which are the socially acceptable linguistic behaviours used in digital exchanges. As part of the netiquette lessons, learning activities are used to explore what Hinrichsen and Coombs (2014) describe as “issues of reputation, identity and membership” (p. 12). Students are taught about register and the pragmatics of communicating online in discussion boards. Students begin by reading examples of discussion posts in class, then analysing written moves by authors to signify agreement and disagreement. Through such analyses, the students develop their understanding of (in)appropriacy of language use in online university contexts. The difference between engaging in debate and attacking individuals is dealt with and students are taught hedging moves. The socially situated nature of digital literacy practices are stressed in these CMC-based activities.

Extending this work on authorship and authority, students then engage with tasks on academic integrity. In-class exercises are presented which guide students through an exploration of textual features such as in-text referencing (direct and indirect) using both institutional style guides and authentic academic articles. Students learn how to paraphrase, legitimately drawing on existing knowledge found in credible sources, using referencing phrases and reporting verbs. These exercises aim to show how text ownership and authorship is defined at SCU and in the programs they will soon be enrolling in (Chandrasoma, Thompson, & Pennycook, 2004). These notions of authority and text-ownership are further incorporated in the EAP program’s assessment items where referencing skills/paraphrasing and appropriacy are directly assessed in rubrics through vocabulary selection (e.g. formal vs informal lexical items; academic collocation etc.) and grammar (e.g. use of modality).

The SCU EAP program has strong positive student feedback. In 2015, independently administered student feedback indicated that 96% of students felt the course had helped them develop academic study skills and 100% felt skills taught were relevant. A review of 2014-2016 data on international EAL student academic performance at SCU took account of 732 commencing (i.e. first year) undergraduate students. Academic performance was measured by success rate, the number of subjects passed divided by the number of subjects enrolled in as a percentage. In Table 1, it can be seen that the success rate of SCU EAP completed students ranges from 77.2%–78.7% compared positively with the 60.9%–67.6% success rate of other international EAL students who had not completed SCU’s EAP for the three years reported. These data suggest SCU EAP pathway students typically perform better in the first year of undergraduate studies than international EAL students who gain admission to their undergraduate studies through providing evidence of meeting SCU English language entry requirements at application.

Table 1. SCU international EAL undergraduate students' success rates (i.e. courses passed/courses taken x 100%) 2014-2016.

Year	Student count		Success rate	
	SCU EAP completed	Other Int'l	SCU EAP completed	Other Int'l
2014	133	128	77.2%	60.9%
2015	72	145	73.3%	56.0%
2016	118	136	78.7%	67.7%

3.2. Method

A survey was used to elicit responses on students' perceptions of their learning experience at the university. Surveys are widely used in applied linguistics to research attitudes (Nunan, 1992). An item pool (De Vellis, 2003) was created through a literature review of international EAL students and digital literacy in higher education (Lonn & Teasley, 2009; Briguglio & Smith, 2012; Ng, 2012; Roche et al., 2015) and included other topics which the researchers' experience suggested were relevant. The items used were:

- A. understanding academic integrity rules
- B. using online plagiarism detection tools
- C. understanding course rules
- D. using online learning management systems
- E. accessing online course material
- F. building social networks
- G. using academic integrity practices.

Simple language was used in the survey for the EAL population as recommended by Dörnyei (2010, p. 41). The draft questionnaire was profiled for vocabulary frequency during the design phase. Seventy-four per cent of the words used in the questions were from the most common 2,000 words in the British National Corpus (Cobb, 2007). Of the 30 word tokens not in those high frequency occurring bands items, the majority appear in the Academic Word List (Coxhead, 2000; e.g. academic; lecturer; regulation). These are items which enrolled international students will need to know during their studies. The remaining items, though not on Coxhead's list, were also study-related tokens (reference, plagiarism, upload, technologies and videos) or proper nouns (Blackboard, Turnitin, SCU). As such, the phrasings of questions were not altered.

Questionnaires should use multiple questions to avoid drawing conclusions based on fallible responses to a single item to minimize the influence of item wording on a single item (DeVellis, 2003, Dörnyei & Csizér, 2012). As such, three items per dimension were used in this study.

A 39-item, five-response key Likert-scale questionnaire was employed to explore seven dimensions of the students' learning experience. Instead of using a semantic differential scale, all response forms were listed, as Krosnick (1999) notes this tends to improve the validity of a scale. The first part of the survey used a five-point response-key scale including: (1) I have a good understanding; (2) I have a basic understanding; (3) I have a limited understanding; (4) I am not sure; and (5) I am confused about it. The second part of the survey focused on the level of difficulty students experience engaging with aspects of the learning experience. The five-point response-key scale here included (1) Very difficult, (2) Difficult, (3) Neutral, (4) Easy, (5) Very Easy. One open-ended question was also employed to give respondents the chance to express themselves in a less restricted manner (Fowler, 2002) and to provide graphic examples in the students' voice (Dörnyei, 2010). Factual questions were kept until the end to collect students' bio-data. In keeping with good design practice, the survey was designed to be finished in approximately 20 minutes (Umbach, 2004) with a progress indicator included.

3.3. Participants

The survey was administered in the sixth week of the second semester of the academic year, with one item helping to identify those students in their first semester of undergraduate. The survey was sent via email to commencing students, as well as posted on first-year undergraduate subject websites (e.g. Diploma of Business) used to deliver course content and handed out in paper form by student research assistants at two campus locations at the end of first-year classes. Sampling fractions of around 10% are typically considered sufficient in educational research (Dörnyei, 2010), provided the sample includes around 30-50 participants from subpopulations of interest where coefficients or a factor analysis is used. Given that the total number of students approached was 748 (530 from the Gold Coast; 173 from Sydney and 45 from Melbourne) and 125 responded, the survey response rate of 16.7% though low is acceptable. All participants were first-year students.

The 125 respondents were first-year students from a range of countries (India $n = 51$, 40.8%; China $n = 33$, 26.5%; Vietnam $n = 8$, 6.4%; Japan $n = 3$, 1.6%; Not given/other $n = 31$, 24.7%). Over 85% of the respondents were studying in the School of Business and Tourism (Business, Accounting, Hospitality and Tourism Management, or Information Technology), the remainder were studying environmental or health science degrees, or chose not to provide their course of studies.

It is of note that 109 (87.2%) of those surveyed reported having not used an LMS before studying at the Australian University. Of those eight that had used an LMS prior to studying at an Australian university, notably only two had used an LMS in their country of origin. The majority of students ($n = 112$, 89.6%) thought that using learning technologies (e.g. an LMS, Turnitin) helped them in their university learning, only two students reported they did not think learning technologies were useful.

4. Results

4.1. Reliability

Internal consistency reliability indices for the test instrument used in the study were high (Nunnally, 1978). The Cronbach alpha score for questions around students' understanding of academic literacy tools and practices were (.92) ranging from (.91) for sub-scale items on institutional policy on academic integrity (Qs 7, 11, 15, 19) to (.98) for questions around respondents' understanding of online technology applications (Qs 7, 11, 15, 19). Items which explored students' perceived difficulty also showed acceptable reliability (.85). While higher reliability scores are typically considered better in survey research, and in particular when measuring narrow constructs such as the ones measured here, high values of (.95) and above may reflect redundancy in the wording of the questions, that is, that the wording was too similar between some items (Streiner, 2003), or that respondents may have felt were repeated (Neuendorf, 2013).

4.2. Descriptive Statistics

Question 34 indicates whether the students came via the University's English for Academic Pathways program ($n = 69$), or entered directly into undergraduate study through presenting evidence of English language proficiency (i.e. recognised test results) ($n = 48$). Where respondents did not respond to all three items per dimension they were deleted from the analysis, resulting in smaller respondent numbers for some dimensions.

Table 2 compares item mean response distributions for each group (No-EAP and EAP). Responses have been aggregated into three categories. *Clear* for responses (1) I have a good understanding, and (2) I have a basic understanding. *Neutral* reports response option (3) I have a limited understanding. *Unsure* represents responses (4) I am not sure, and (5) I am confused about it. The EAP group responses indicate that of those surveyed, the majority developed a clear understanding of academic integrity rules, course rules and how to use an LMS and how to use plagiarism detection tools. The No-EAP group showed greater response variability with

only a quarter of respondents indicating they had a clear understanding of those same issues. In contrast, between 56% and 62% of responses indicated that students who had not come to the university via its EAP pathway were unsure or confused about those same issues. The SCU EAP pathway students reported less difficulty accessing online material, developing social networks and using academic integrity practices than the No EAP pathway students.

Table 3 presents the response means, standard deviations and standard errors for the aggregated dimensions. Across most dimensions explored, the EAP pathway students have smaller response means, indicating via their Likert-scale self-report responses that they have a better understanding of, and less difficulty with, issues than students who enter directly into their undergraduate programs. For understanding of dimensions A-Academic integrity, B-Turnitin, C-Course Requirements, and D-Online technologies, EAP Pathway students reported means ranging from 1.47 - 1.50 indicating a position between a (1) good and a (2) basic understanding of those dimensions. In stark contrast, students who were admitted to the program without taking the University EAP pathway reported means for those same dimensions between 3.48–3.64, thus reporting a position between (3) unsure of their understanding and a (4) limited understanding. Only for the dimension of developing social networks do the group means appear to be similar (No EAP pathway $M = 3.13$, $SE = .14$; EAP pathway $M = 3.61$, $SE = .08$). For this dimension both groups' response means approach (3), reflecting a neutral response to their experienced difficulty of establishing social networks at the university. A difference was apparent in the response means for dimension G- Difficulty with Academic Integrity, with the No EAP group indicating more reported difficulty ($M = 2.15$, $SE = .12$) than EAP pathway students ($M = 3.92$, $SE = .08$).

Table 2. Comparison of EAP vs No-EAP pathway: mean response distribution. Item response scale A- D: Some = I have a good understanding + I have a basic understanding; Neutral = I have a limited understanding; Unsure = I am not sure + I am confused about it. Item response scale E-G: Difficult = Very difficult + Difficult; Neutral = Neutral; Easy = Easy + Very Easy.

	Pathway	<i>N</i>	Some	Neutral	Unsure
A. Understanding academic integrity rules	No EAP	48	22.8%	15.2%	62.0%
	EAP	69	96.5%	2.5%	1.0%
B. Using online plagiarism detection tools	No EAP	47	22.5%	12.3%	65.2%
	EAP	68	98.5%	1.5%	0.0%
C. Understanding course rules	No EAP	48	24.0%	20.0%	56.0%
	EAP	69	98.0%	1.5%	0.5%
D. Using an LMS	No EAP	48	24.0%	20.0%	56.0%
	EAP	69	98.0%	1.0%	1.0%
			Difficult	Neutral	Easy
E. Accessing online material	No EAP	48	64.0%	20.0%	16.0%
	EAP	69	5.0%	9.0%	86.0%
F. Developing social networks	No EAP	48	28.0%	37.5%	34.5%
	EAP	69	6.7%	34.6%	58.7%
G. Using academic integrity practices	No EAP	48	77.5%	15.5%	7.0%
	EAP	69	2.6%	20.4%	77.0%

Table 3. Comparison of EAP vs non-EAP pathway: response means, standard deviations (*SD*) and standard error. Item response scale A- D: (1) I have a good understanding; (2) I have a basic understanding; (3) I have a limited understanding; (4) I am not sure; and (5) I am confused about it. Item response scale E-G: (1) Very difficult (2) Difficult (3) Neutral (4) Easy (5) Very Easy.

	Pathway	<i>N</i>	Mean	<i>SD</i>	Std. Error Mean
A. Understanding academic integrity rules	No EAP	48	3.63	1.31	.19
	EAP	69	1.50	.57	.07
B. Using online plagiarism detection tools	No EAP	47	3.64	1.36	.20
	EAP	68	1.47	.52	.06
C. Understanding course rules	No EAP	48	3.48	1.29	.19
	EAP	69	1.54	.53	.06
D. Using an LMS	No EAP	48	3.48	1.33	.19
	EAP	69	1.45	.51	.06
E. Accessing online material	No EAP	48	2.38	.98	.14
	EAP	69	4.04	.67	.08
F. Developing social networks	No EAP	48	3.13	.97	.14
	EAP	69	3.61	.72	.08
G. Using academic integrity practices	No EAP	48	2.15	.82	.12
	EAP	69	3.92	.69	.08

4.3. Tests of significance for differences between EAP vs No EAP pathways students

A series of independent samples *t*-tests were performed to test if statistically significant differences existed between the EAP and No-EAP groups on the seven questionnaire categories. These results are presented in Table 4. As the relationship among the dependent variables here was not of interest, *t*-tests rather than a MANOVA was used (Huberty & Morris, 1989). To minimize the chance of type I error due to multiple tests, a Bonferroni correction was performed with resultant acceptable probability levels set at $\alpha = 0.007$. Levene's test for equality of variance revealed significant values for the questionnaire categories A-E, but not for the two categories of F and G. For this reason, equal variances within sample groups has not been assumed for the first five categories. T-tests revealed statistically significant differences between groups at $p = 0.00$ for the six questionnaire categories of A-E, while the category of "difficulty developing social networks" was not significant at $\alpha = 0.007$.

The No EAP group ($N = 48$) was associated with poorer understanding of dimension A-academic integrity, $M = 3.63$, $SD = 1.31$. By comparison, the EAP group ($N = 69$) was associated with a better understanding of academic integrity $M = 1.5$, $SD = .56$. To test the hypothesis that the EAP and No-EAP groups were associated with statistically different reported understanding of academic integrity, an independent samples *t*-test was performed. The distributions were sufficiently normal (George & Mallery, 2010) for the purposes of a *t*-test (i.e., Skew $-.670$ and Kurtosis $-.646$). The assumption of homogeneity of variances was tested,

but the data did not satisfy Levene's F test, $F(47, 68) = 41.91$. The significant (2-tailed) result of $p = .000$ indicates there is a difference in variances and it is not likely to be due to chance or sampling error. As can be seen in Table 4, the differences between the means for the No EAP and EAP groups were also statistically significant for the dimensions of understanding B-Turnitin, C-Course and D-Online technologies. These represented large effect sizes² of $r = .56$, $r = .53$ and $r = .54$ respectively. There were also significant differences between groups for the mean responses for the self-reported experiences of difficulty with E- Accessing Material, representing a large effect size $r = .51$; and G - Difficulty with Academic Integrity.

4.4. Open ended responses

Question 47 provided respondents with the opportunity to give comments or elaborate on points raised in the preceding discrete multiple-choice questions. While some novel points were raised, the overwhelming majority of open-ended responses from students broadly reflect and provide further support for the opinions captured in the above described mean responses.

Several students acknowledged the usefulness of the online learning tools they were engaging with in their undergraduate studies. Respondent number (R) 98 commented, "this way of learning is very helpful to us. We develop our skills." Survey respondents also acknowledged that using digital academic literacy tools was new to them, for example, R118 said, "I am indeed experiencing a different system of learning here in Australia... Those examples are very useful in helping me cope up with the assignments." In addition, some students mentioned specific tools, such as Turnitin, being "really helpful" (R76).

Students who came to SCU on a non-EAP pathway emphasised difficulties with the number of systems they needed to learn, "too many programs. I don't know any these programs and everything is online" (R76). One student expressed difficulty locating the programs and resources, describing them as "hard to find, and the upgrade is not in time" (R75). There were also rare negative comments by EAP pathway students about specific programs, for example, "Almost all international students, including me, mention the need of improvement in quality of the sound in collaborate lecture, since it is tough for us to catch what they're saying with noise/lower-quality sound" (R52).

One point raised by a respondent spoke to the lack of consistency across LMS sites within one program. R67 wrote that some sites were "very organised and clear with great profit to the students. other professors are having not very organised blackboard sites." This suggests some difficulty some students experience may be due to the different formatting of LMS sites across one program. This feedback is an important point for institutions to consider in implementing digital technology across subjects.

Other issues raised in this section of the survey, which were not directly explored in the survey questions, include: high costs of study materials, travel time to university from their accommodation, as well as praise and critique of individual teachers or subjects. One student, R42, stressed the difficulty in accessing resources when not having their own computer, "the material is not easy to get. especially if you do not [have] a good computer or the right program. [which is a] real problem." because without which the student had trouble "getting the materials in time." Students need to be provided with access to technology if their learning experience is in part online. The feedback here suggests students were not aware of computer labs or loan computers in the library.

² Here, r is the point-biserial correlation coefficient (Field, 2009, p. 56,7) which quantifies the standardised effect size in terms of the degree of relationship between level of understanding and whether a student did the EAP or not.

Table 4. Independent samples t-tests on differences between the EAP and No-EAP pathway groups on the 7 questionnaire categories.

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		<i>F</i>	Sig.	<i>t</i>	df	Sig. (2- tailed)	Mean Differenc e	Std. Error Differenc e	95% Confidence Interval of the Difference		
									Lower	Upper	
A.	Understanding academic integrity rules	Equal variances assumed	41.910	.000	11.990	115	.000	2.13021	.17766	1.77830	2.48212
		Equal variances not assumed			10.587	59.416	.000	2.13021	.20120	1.72767	2.53275
B.	Using online plagiarism detection tools	Equal variances assumed	46.738	.000	11.979	113	.000	2.16935	.18109	1.81058	2.52812
		Equal variances not assumed			10.438	55.496	.000	2.16935	.20783	1.75293	2.58578
C.	Understanding course rules	Equal variances assumed	43.477	.000	11.253	115	.000	1.94611	.17294	1.60354	2.28867
		Equal variances not assumed			9.889	58.229	.000	1.94611	.19680	1.55221	2.34000
D.	Using an LMS	Equal variances assumed	51.831	.000	11.564	115	.000	2.03148	.17567	1.68351	2.37944
		Equal variances not assumed			10.095	56.638	.000	2.03148	.20123	1.62846	2.43450
E.	Accessing online material	Equal variances assumed	10.197	.002	-10.847	115	.000	-1.65082	.15219	-1.95228	-1.34935
		Equal variances not assumed			-10.166	77.274	.000	-1.65082	.16238	-1.97414	-1.32749
F.	Developing social networks	Equal variances assumed	2.590	.110	-3.056	115	.003	-.47849	.15658	-.78863	-.16834
		Equal variances not assumed			-2.903	82.081	.005	-.47849	.16481	-.80635	-.15062
G.	Using academic integrity practices	Equal variances assumed	.956	.330	-12.680	115	.000	-1.77808	.14023	-2.05585	-1.50031
		Equal variances not assumed			-12.320	90.491	.000	-1.77808	.14433	-2.06479	-1.49137

5. Discussion

The above analysis shows that there were differences in experience and performance between international EAL students who gained admission to their undergraduate studies via the university EAP pathway and those who gained admission through meeting English language proficiency entry requirements (i.e. presenting test scores as evidence of meeting English language proficiency requirements). The SCU EAP pathway students in this study self-reported less difficulty in their subsequent undergraduate studies and a sounder understanding of course requirements and academic integrity practices than their non-SCU EAP pathway student peers. The SCU EAP pathway students reported less difficulty using digital tools in their studies (e.g. Turnitin), the use of which requires a sound understanding of authorship and text ownership as practiced in Australian universities. In contrast, the non-EAP pathway students in this study experienced difficulty understanding the rules and practices associated with academic integrity, including when and how to use the plagiarism software detection tools. The above description of the ten week SCU EAP program's curriculum detailed exercises and assessments developing the students' knowledge of authorship (Freebody & Luke, 1990; Pennycook, 1996) and the institutional operationalisation of this knowledge through policy, procedure and practice (Roche et al., 2015; Chandrasoma et al., 2004). The embedded digital literacy learning experience in the EAP program appears to have equipped its graduates well for their subsequent study at the university. These findings highlight a key advantage of institutionally operated EAP pathway programs: they can provide targeted, contextually relevant EAP tuition which is directly relevant to the institutions (and programs) students are matriculating into, including using the same tools (e.g. Blackboard, and Turnitin), underpinned by the academic integrity practices that the students will need to regularly employ in their university studies. While debate continues as to the relevance of teaching generic ELP (and study skills; see Biber & Conrad, 2009) as opposed to discipline specific language and study skills (Murray, 2016), this study shows the importance and benefits of embedding the digital literacy practices relevant to contemporary university study in EAP pathway programs.

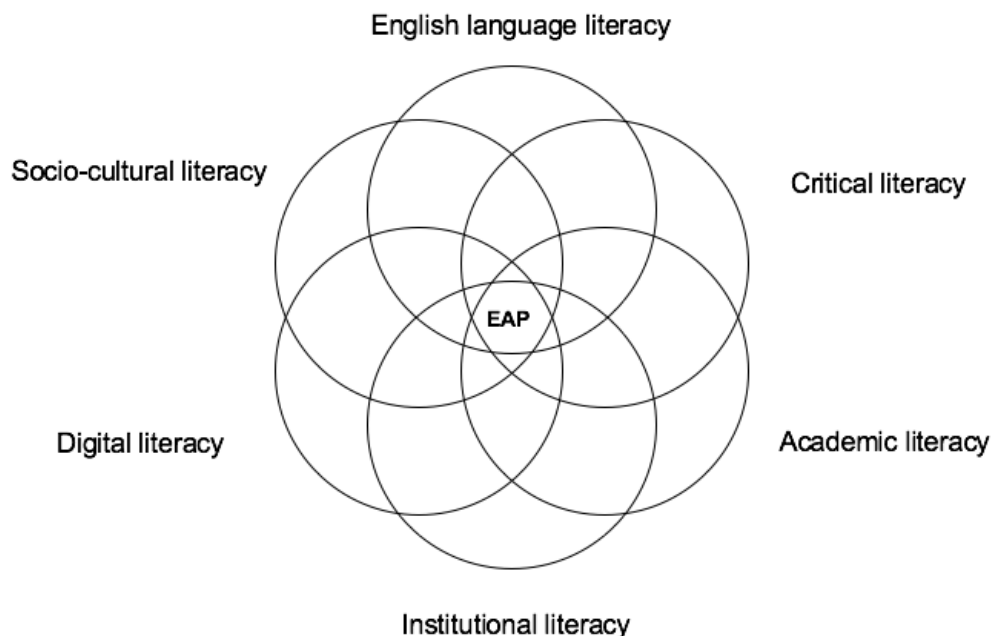


Figure 1. An intersecting EAP literacies framework (after Miller, 2015).

These findings support existing studies which argue for a broadening of our conception of EAP (Arkoudis, et al., 2012; Bachman, 1990; Murray, 2010) to include a wider range of EAP skills, discourses and practices. My findings also suggest that there is an overlap between the several

distinct literacies Miller (2015) proposes as constituting EAP (i.e. digital, institutional, academic, language and socio-cultural). Drawing on the self-reported experience and success rates of EAP students seen in this study, I propose that contemporary, well-designed EAP programs should be reconceived at the intersection of those six literacies (Figure 1) reflecting the framework underpinning university teaching and learning identified by Miller (2015). Beyond a skill-based EAP program focused on traditional English language proficiency subskills (reading, writing, listening and speaking), the EAP program presented here exposed students to and assessed their development of academic literacy practices which are underpinned by a set of social and cultural values around text ownership, authority and credibility (Pennycook, 1996). SCU EAP students' success in subsequent studies in comparison to their non-EAP pathway student colleagues highlights that language proficiency in the four sub-skills, though necessary, are not sufficient for academic success and furthermore suggests an important role for digital literacy practices in preparing international EAL students for undergraduate study in present-day higher education institutions. This reconceptualisation points the way forward for curriculum enhancement for EAP pathway programs, with implications for teaching content, assessment practices and learning outcomes of such programs. Given the rapidly evolving digital landscape described by Belshaw (2012), the evaluation of the relevance and efficacy of these digital literacy practices will need to be routinely re-assessed.

The present study has some limitations. The wording of response choices may have confused international EAL students, with very little difference between the 2nd and 3rd response options: "basic understanding" and a "limited understanding". Nevertheless, the results presented here show the scales displayed acceptable internal consistency, and as such I have interpreted the results as indicating the participants treated the wording as a typical semantic differential scale, suggesting the synonymous wording made little difference to the data. In the results section, I attributed the SCU EAP students' success in their undergraduate studies to the design and content of the EAP program. However, caution should always be exercised in drawing conclusions about causation from correlation. It is possible that other factors, in addition to the SCU EAP course content, may have contributed to the students' subsequent success at university. For example, the study compares two student cohorts, one which has been at the university longer (the EAP group) with another which was new to the university (No EAP). We cannot be certain if the SCU EAP content was entirely responsible for the difference in results or whether it was because one cohort had been settled longer in the country or had just had more exposure to the university's systems. Nevertheless, the open-ended responses in the survey provide some further support for my analysis, with cited examples showing that the SCU EAP students felt more confident in the digital learning environment than the non-EAP pathway peers. In those open-ended responses, the EAP participants also reported that they perceived a value in the content of the EAP program and that the course content helped them develop an understanding of "a different system of learning here in Australia" i.e. the culture of education at the university and its concepts of credibility, authorship and text ownership which benefited these students in their studies.

6. Conclusion

In an era of widening-participation in higher education, with growing numbers of international EAL students coming from an increasingly diverse range of cultures of education, we cannot expect homogenous standards of literacies (digital and otherwise) in our university student cohorts. Pathway programs can however serve a beneficial function in equipping these students with the pre-requisite literacies they will need in their studies. This research, based on student performance and student feedback, indicates that international EAL students who access higher education through a university EAP pathway program with digital literacy practices underpinning its conceptualisation of EAP, experience less difficulty in their award studies and are more likely to succeed in those subsequent studies. The EAP program's curriculum here moves beyond the traditional focus on language skills and drills (i.e. reading/writing/speaking and listening) to focusing on academic literacy practices and the students have benefited from

this recalibration. These findings have implications for EAP curriculum design and assessment, as well as for the teaching delivery and learning outcomes of university EAP pathway programs.

This paper also suggests a new way of thinking about the construct of EAP as located at the intersection of six literacies: language, socio-cultural, digital, institutional, academic and critical. This study has not tried to identify the relative contributions of those literacies in the student performance in subsequent undergraduate studies. It does however suggest that these literacies are perceived by students as contributing positively to their undergraduate performance and should be explicitly addressed in EAP programs preparing students for university study. EAP programs should embed and design assessments which explore the intersection between the six literacies noted here. Given the increasingly digitised nature of university education, EAP pathway programs should embrace the teaching and learning of digital literacy practices if they aim to produce graduates who are more likely to succeed in their degree studies and are therefore more likely to achieve their goals at university and beyond.

Acknowledgements

Many thanks to Andrew Wynhoven for his ICT contributions and assistance setting up the initial version of the EAP learning-site referred to here. Thank you also to my colleagues at SCU College whose conversations helped shape the concept of digital literacy as presented here.

References

- Andrade, M. S. (2006). International students in English-speaking universities: Adjustment issues. *Factors Journal of Research in International Education*, 5(2), 131-154.
- Arkoudis, S., Baik, C., & Richardson, S. (2012). *English language in higher education: From entry to exit*. Camberwell: ACER Press.
- Bachman, L. F. (1990). *Fundamental considerations in language testing*. Oxford: Oxford University Press.
- Bayliss, A., & Ingram D. E. (2006). IELTS as a predictor of academic language performance. Paper presented at the *Australian International Education Conference*. Retrieved from <http://www.aiec.idp.com>
- Belshaw, D. (2012). *What is 'digital literacy'? A Pragmatic investigation* (Doctoral dissertation, Durham University, United Kingdom). Retrieved from <http://etheses.dur.ac.uk/3446/>
- Biber, D., & Conrad, S. (2009). *Register, genre, and style*. New York: Cambridge University Press.
- Birrell, R. J. (2006). Implications of low English standards among overseas students at Australian universities, *People and Place*, 14(4), 53-64. (Centre for Population and Urban Research, Monash University, Melbourne Vic Australia.)
- Briguglio, C., & Smith, R. (2012). Perceptions of Chinese students in an Australian university: are we meeting their needs? *Asia Pacific Journal of Education*, 32(1), 17-33. doi:10.1080/02188791.2012.655237
- Catterall, J., Aitchison, C., & Rolls, N. (2016). Disconnected pedagogies: Experiences of international students in higher education. *Journal of Academic Language and Learning*, 10(2), A70-A79.
- Chandrasoma, R., Thompson, C., & Pennycook, A. (2004). Beyond plagiarism: Transgressive and nontransgressive intertextuality. *Journal of Language, Identity, and Education*, 3(3), 171-193.
- Coates, H., James, R., & Baldwin, G. (2005). A Critical Examination of the Effects of Learning Management Systems On University Teaching and Learning. *Tertiary Education and Management*, 11(1), 19-36. doi:10.1007/s11233-004-3567-9
- Cobb, T. (2007). *The compleat lexical tutor*. Retrieved August 1, 2013, from www.lextutor.ca
- Coxhead, A. (2000). A New Academic Word List. *TESOL Quarterly*, 34(2), 213-238.

- Dang, T. T., & Robertson, M. (2010). Impacts of Learning Management System on Learner Autonomy in EFL Learning. *International Education Studies*, 3(3), 3-11.
- DeVellis, R. F. (2003). *Scale development: Theory and applications*. Thousand Oaks, CA: Sage.
- Diez-Bedmar, M. B., & Perez-Paredes, P. (2012). The Types and Effects of Peer Native Speakers' Feedback on CMC. *Language Learning and Technology*, 16(1), 62-90.
- Dörnyei, Z., & Csizér, K. (2012). How to design and analyze surveys in SLA research? In A. Mackey and S. Gass (Eds.). *Research methods in second language acquisition: A practical guide* (pp. 74-94). Malden, MA: Wiley-Blackwell.
- Dörnyei, Z. (2010). *Questionnaires in second language research: Construction, administration, and processing* (2nd ed.). London: Routledge.
- Dyson, B. P. (2014). Are onshore pathway students prepared for effective university participation? A case study of an international postgraduate cohort. *Journal of Academic Language and Learning*, 8(2), A28-A42.
- Elder, C., Bright, C., & Bennett, B. (2007). The role of language proficiency in academic success: perspectives from a New Zealand university. *Melbourne Papers in Language Testing*, 12(1), 24-28.
- Elder, C., & O'Loughlin, K. (2003). Investigating the relationship between intensive English language study and band score gain on IELTS. *IELTS Research Reports*, 4, 207-254.
- Evans, S., & Morrison, B. (2011). Meeting the challenges of English-medium higher education: The first-year experience in Hong Kong. *English for Specific Purposes*, 30, 198-208.
- Expert Group. (2012). *Flinders University: Memorandum*. Adelaide: Flinders University.
- Fenton-Smith, B., Humphreys, P., Walkinshaw, I., Michael, R., & Lobo, A. (2015). Implementing a university-wide credit-bearing English language enhancement programme: issues emerging from practice. *Studies in Higher Education*, 42(3), 1-17.
- Field, A. (2009). *Discovering statistics using SPSS*. 3rd Edition. London: Sage.
- Flowerdew, J., & Li, Y. (2007). Plagiarism and second language writing in an electronic age. *Annual Review of Applied Linguistics*, 27, 161-183.
- Fowler, F. J. (2002). *Survey Research Methods* (3rd ed.). Sage: Thousand Oaks, CA.
- Floyd, C. B. (2015). Closing the gap: International student pathways, academic performance and academic acculturation. *Journal of Academic Language and Learning*, 9(2), A1-A18.
- Freebody, P., & Luke, A. (1990). 'Literacies' Programs: Debates and Demands. *Prospect: Australian Journal of TESOL*, 5(7), 7-16.
- George, D., & Mallery, M. (2010). *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update* (10th ed.) Boston: Pearson.
- Handa, N., & Power, C. (2005). Land and discover! A case study investigating the cultural context of plagiarism. *Journal of University Teaching and Learning Practice*, 2(3), 65-84.
- Hagel, P. (2015). Towards an understanding of 'Digital Literacy(ies)', *discourse: Deakin University Library research & practice*, 1. <http://dro.deakin.edu.au/view/DU:30073198>
- Hinrichsen, J., & Coombs, A. (2014). The five resources of critical digital literacy: a framework for curriculum integration. *Research in Learning Technology*, 21, 21334 doi:10.3402/rlt.v21.21334
- Huberty, C. J., & Morris, J. D. (1989). Multivariate analysis versus multiple univariate analyses. *Psychological Bulletin*, 105(2), 302-308.
- Krosnick, J. A. (1999). Survey research. *Annual Review of Psychology*, 50, 537-567.
- Lee, Y., & Greene, J. (2007). The predictive validity of an ESL placement test: A mixed methods approach. *Journal of Mixed Methods Research*, 1, 366-389.

- Littlejohn, A., Beetham, H., & McGill, L. (2012). Learning at the digital frontier: a review of digital literacies in theory and practice. *Journal of Computer Assisted Learning*, 28(6), 547-556.
- Lonn, S., & Teasley, S. D. (2009). Saving time or innovating practice: Investigating perceptions and uses of Learning Management Systems. *Computers and Education*, 53(3), 686-694. doi:10.1016/j.compedu.2009.04.008
- Luke, A. (2014). Defining critical literacy. In J. Pandya and J. Ávila (Eds.). *Moving critical literacies forward: A new look at praxis across contexts* (pp. 19-31). New York, NY: Routledge.
- Miller, A. (2015). On paper, in person, and online: A multi-literacies framework for university teaching. *Journal of Academic Language and Learning*, 9(2), A19-A31.
- Moore, P. J., & Harrington, M. (2016). Fractionating English language proficiency: policy and practice in Australian higher education. *Current Issues in Language Planning*, 17(3-4), 385-404.
- Murray, N. (2010). Conceptualising the English language needs of first year university students. *The International Journal of the First Year in Higher Education*, 1(1), 55-64.
- Murray, N. (2016). An academic literacies argument for decentralizing EAP provision. *ELT Journal*, 70(4), 435-443. doi:10.1093/elt/ccw030
- Murray, N., & Hicks, M. (2014). An institutional approach to English language proficiency. *Journal of Further and Higher Education*, 40(2), 1-18.
- Nasah, A., DaCosta, B., Kinsell, C., & Seok, S. (2010). The digital literacy debate: an investigation of digital propensity and information and communication technology. *Educational Technology Research and Development*, 58(5), 531-555.
- Neuendorf K. (2011). *Internal consistency reliability: Can Cronbach's alpha be too high? COM 631-Multivariate analysis*. [cited 2013 May 05]. Available from: <http://academic.csuohio.edu/kneuendorf/c631111/hand5a.pdf>
- Ng, W. (2012). Can we Teach Digital Natives Digital Literacy? *Computers & Education*, 59(3), 1065-1078. doi:10.1016/j.compedu.2012.04.016
- Nunnally J., C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill.
- Nunan, D. (1992). *Research methods in language learning*. Cambridge: Cambridge University Press.
- Pennycook, A. (1996). Borrowing others' words: Text, ownership, memory, and plagiarism. *TESOL Quarterly*, 30(2), 201-230.
- Phakiti, A., Hirsh, D., & Woodrow, L. (2013). It's not only English: Effects of other individual factors on English language learning and academic learning of ESL International students in Australia. *Journal of Research in International Education*, 12(3), 239-258.
- Ramsay, S., Barker, M. & Jones, E. (1999). Academic adjustment and learning processes: A comparison of international and local students in first - year university. *Higher Education Research & Development*, 18(1), 129-144. doi:10.1080/0729436990180110
- Robertson, M., Line, M., Jones, S. & Thomas, S. (2000). International students, learning environments and perceptions: A case study using the Delphi technique. *Higher Education Research & Development*, 19(1), 89-101. doi:10.1080/07294360050020499
- Roche, T. & Harrington, M. (2013). Recognition vocabulary knowledge as a predictor of academic performance in an English-as-a-foreign language setting. *Language Testing in Asia*, 3, 133-144. doi:10.1186/2229-0443-3-12
- Roche, T., Sinha, Y., K. & Denman, C. (2015). Unravelling failure: belief and performance in English for Academic Purposes programs in Oman. In R. Al-Mahrooqi and C. Denman (Eds.). *Issues in education in the Arab world* (pp. 37-59). Newcastle, United Kingdom: Cambridge Scholars Publishing.

- Schroeder, A., Minocha, S., & Schneider, C. (2010). The strengths, weaknesses, opportunities and threats of using social software in higher and further education teaching and learning. *Journal of Computer Assisted Learning*, 26(3), 159-174. doi:10.1111/j.1365-2729.2010.00347.x
- Streiner, D. L. (2003). Starting at the beginning: an introduction to coefficient alpha and internal consistency, *Journal of Personality Assessment*, 80, 99-103.
- Umbach, P. D. (2004). Web surveys: Best practices. *New Directions for Institutional Research*, 121, 23-38. doi:10.1002/ir.98
- Yixin, W., & Daller, M. (2007). Predicting International Chinese Students Academic Achievement. In J. Angouri, T. Harrison, S. Schnurr, and S. Wharton (Eds.). *Proceedings of the 47th Annual Meeting of the British Association for Applied Linguistics, Learning, Working and Communicating in a Global Context* (pp. 217-227). Coventry, United Kingdom. Retrieved from http://www.baal.org.uk/proceedings_2014.pdf#page=225