

Measuring the beginning: a quantitative study of the transition to higher education.

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Abstract

This quantitative study measures change in certain factors known to influence success of first-year students during the transition process: self-efficacy, autonomous learning and social integration. A social integration scale was developed with three subscales: 'sense of belonging', 'relationship with staff' and 'old friends'. Students responded to this and existing scales measuring self-efficacy and autonomous learning, before and after participating in transition activities including a group-work poster project. We discuss positive outcomes regarding a sense of belonging and how our expectations in other areas such as self-efficacy were not met. The importance of early contact with academic staff and small-group work is confirmed. Tinto's assertions on pre-existing relationships are challenged. We suggest that further investigation might prevent a 'scattergun' approach to transition based upon superficial understanding of outcomes. We discuss potential models for transition design and support a 'longer' process with several opportunities for student engagement in success factor development.

Introduction

How difficult can it be to facilitate that superficially simple task of successfully transferring students from one level of education to another? Those of us immersed in designing the early first-year experience have developed increasingly complex strategies to engage, retain and prepare students for university study. The accepted view is that multi-layered strategies are essential in trying to ensure successful transition (Thomas, 2012). However, it has also been suggested that there has been insufficient academic scrutiny and that there are limits to what we can achieve (Palmer, O'Kane and Owens 2009). Here we question which interventions have the desired effect and what do they have an effect on?

Most studies of induction and transition are evaluative or use qualitative research (Edward, 2003) and the success of our processes is rarely measured quantitatively. Insufficient evidence of successful practice has been criticised as leading to a preponderance of studies based upon 'opinion and description' (Bovill, Morris and Bulley, 2008 p. 56). The aim of this study is to help bridge this apparent gap in knowledge by examining quantitative data of the outcomes of one induction and transition process for a diverse first-year undergraduate group.

From induction to transition and beyond!

The successful transition of students into higher education is now generally regarded as a longer, more complex, process than 'induction'. This has received some criticism (Longden 2006) but has also been found to be beneficial in, for example, the case of institutions recognised as performing well in the retention of students from lower socio-economic groups (Yorke and Thomas 2003). We have found it useful to define our terms so that 'induction' ('first-contact' during week one) forms part of the overall 'transition' strategy which we see as the longer process of acclimatisation during the first year.

The transition process in this study underwent significant change following the expansion in student numbers post-Dearing (1997) along with evidence of slipping retention rates (1999-2001). The main change to our strategy was to design an on-going process rather than a short event-focussed induction. Influenced by extant literature (e.g. Owen

2002; Yorke 1999) we developed a core module, Independent Learning in Law (ILL), which included closer contact with a personal tutor, involvement of 2nd and 3rd years in 'guidance' seminars, early return of a marked piece of work, the use of a reflective diary and a summative reflective assessment of the transition period. Subsequent development of the module has been further influenced by our research (Brooman and Darwent 2012a, 2012b), and we have included students much more actively in transition rather than treating them as passive receivers of information and paperwork.

Three core elements in ensuring successful transition.

Amongst the many factors identified as having an impact on the transition process we decided, for clarity, to focus on three which had been highlighted in our previous studies as being particularly important.

Self-efficacy has been extensively explored in relation to academic success and retention (Devonport and Lane 2006; Multon, Brown, and Lent 1991). Self-efficacy concerns '*beliefs in one's capabilities to organise and execute the courses of action required to produce given attainments.*' (Bandura 1997, 3). Those who have greater confidence in themselves tend to initiate more things, apply additional effort, persevere in the face of difficulty and try to master the task at hand (Hseih, Sullivan, and Guerra 2007).

Self-regulated and autonomous learning have been linked to academic success (Macaskill and Taylor 2010; Vrugt and Oort 2008). While university students are expected to work more independently, this is often not clearly articulated and many students have difficulty adjusting to university teaching methods (Macaskill and Taylor 2010). Learner autonomy includes the student having both the basic skills to learn such as time-management and meeting deadlines (study habits) and an understanding of how they can best approach their learning (independence of learning beliefs). Low perceptions of academic competence inhibit autonomy but being in control of learning and feeling motivated can enhance it (Fazey and Fazey 2001).

Social integration is the '*extent to which a student feels connected to the college environment, peers, faculty and others in college and is involved in campus activities*' (Lotkowski, Robbins, and Noeth 2004). The theory that social integration influences commitment and engagement at university is widely accepted (Beil et al 1999; Hausmann, Schofield, and Woods 2007; Tinto 1982, 2003).

The transition process being measured

The measurement period covered in this study is that between week one, day two (T1) and week five, day one (T2). There are collateral elements to the transition process at this time including an assessed group-work poster task started on day two with group feedback in week five. The poster task provides a group mark worth 10% of the module assessment. We assess the poster because we believe that students will be more motivated to engage with the process (Creme 2005). The provision of face-to-face feedback for the poster early in the semester is useful to build confidence and provides a formative element towards other assessments.

During this period there are two lectures and two workshops with the student's personal tutor covering essay writing, research methods, and use of reflective diaries as well as large group IT sessions. The four main subject areas of the degree also begin teaching in week two. The poster group exercise (consisting of five students) and personal tutor-led workshops (ten students) are the heart of the process facilitating engagement with peers and

staff. The part played by personal tutors during the transition process is important and has been recognised in many previous studies (Owen 2002; Vinson et al 2010) and it has often been suggested that induction processes benefit from splitting large cohorts of students into small groups (Glogowska, Young, and Lockyer 2007).

A significant reason for choosing the poster exercise is that we hoped it would engage students in their studies. Our reasoning mirrored some of Zepke and Leach's (2010) ten proposals for action regarding student engagement such as enhancing self-belief, enabling autonomous learning, developing learning relationships and providing active, collaborative, learning opportunities. We hoped that this, together with placing members of academic staff at the core of the early transition process, would help students to develop self-efficacy, autonomous learning and a sense of belonging.

Independent inquiry-based research has been found to be a motivator for student engagement in their course (Levy and Petrulis 2012). Students often find benefits in being active participants in knowledge acquisition. Most research for a poster will rely on the gathering of another's ideas rather than making discoveries and creating knowledge. It does, however, involve the creative step of transferring this information to an unusual medium of communication in a subject which relies so heavily on the written word. We postulated that such a creative step would appeal to students' imagination and facilitate engagement with the subject.

The aim of this study

The principal aim of this study was to gain a better understanding of the effect of our early interventions by measuring changes in those key factors we had identified as impacting on student success in the first-year: self-efficacy, learner autonomy and social integration. Most research identifies what influences retention and success in first-year students but less quantitatively measures the effect of specific interventions or combinations of interventions. Longden (2006) suggests that this carries the danger of creating 'knee-jerk reactions' and ineffective interventions. We also hoped to contribute to the wider debate between those tending to advocate shorter (Longden 2006), or longer (Vinson et al 2010), transition strategies. Finally, could we find evidence to justify the commitment of staff and student time?

Methodology

a. Research design

The experimental design of this study, using quantitative data from questionnaires administered to first year law students, aimed to describe their responses at T1 and T2 and to determine any change. The study also tested the relationships of existing self-efficacy, autonomous learning and social integration theories.

b. Participants

The target group (n=248) consisted of full-time first year law students registered for the ILL module of the LLB course, or LLB combined with Criminal Justice (LLB/CJ). A probability sampling method was utilised and all students in the cohort had the same opportunity to be included. The first questionnaire was administered on the second day of the semester, when the whole cohort was expected to be present. The second questionnaire was administered in

similar circumstances four weeks later. Both questionnaires were completed by 141 students, an overall response rate of 57%.

c. Measures

Self-efficacy Scale (Bossher and Smit 1997) The scale consists of 12 items, with seven negatively worded statements, and includes items such as '*If something looks too complicated, I will not even bother to try it*'. Participants respond on a 5-point Likert scale from '*strongly agree*' to '*strongly disagree*'.

College Academic Self-efficacy Scale (CASES, Owen and Froman 1988). This scale is used alongside the general Self-efficacy Scale only at T2 to assess the construct validity of the latter scale. The authors report reliability coefficients ranging between .90 and .92. According to some researchers general measures of self-efficacy have less predictive ability (Devonport and Lane 2006) and using self-efficacy instruments directly corresponding to the task enhances prediction (Pajares 2002). However, new first-year students' responses to a specific efficacy scale may be compromised by their unfamiliarity with the context, and so a general scale was employed.

Autonomous Learning Scale (Macaskill and Taylor 2010). This recently developed 12-item scale, is reported to have satisfactory concurrent validity and good internal reliability ($\alpha=.78$). It has two subscales measuring Independence of learning and Study habits. Responses to such items as '*I take responsibility for my learning experiences*' are recorded on a 5-point scale, from 1 (*very unlike me*) to 5 (*very like me*). Two items are negatively worded.

Social integration Extensive searches did not reveal an available, short, social integration scale. Beil et al (1999) use four items concerning friendliness with other students, however social engagement at university encompasses relationships with staff, online social contact and existing social networks (Krause 2005). Thus a new scale was piloted following the method described by Field (2003).

Thirty-one items were believed to cover the full range of the construct including:

- Belonging to the university community (5 items)
- Relationship with old friends (5 items)
- Making new friends at university (5 items)
- Relationship with family (3 items)
- Relationship with staff (4 items)
- Making relationships through clubs, societies and student union (3 items)
- Use of internet in relationships with others (3 items)
- Use of mobile phone in relationships with others (3 items)

After piloting the questionnaire with part-time law students, it was completed satisfactorily by 78% full-time undergraduate respondents ($n= 195$). The sample size fulfils the necessary criteria of at least five participants per variable (Hair et al 2010), and average communalities of more than .6 (MacCallum et al 1999).

Data were screened and highly skewed items were omitted before Exploratory Factor Analysis (EFA) was used to reveal underlying constructs. Varimax, an orthogonal rotation

method, was used to reduce the data down to a small number of uncorrelated variables for use in multivariate analysis. The scree test indicated a four-factor structure.

The factor loadings and reliability estimates are shown in Table 2. The loadings were all above $\pm .50$, which Hair et al (2010) describe as ‘practically significant’ in samples of more than 100. The factors accounted for 22.2%, 15.2%, 12.7% and 8.4% variance respectively. The reliability measures however demonstrated that factors 3 and 4 fell below the accepted minimum of .7 (Loewenthal 1996). Gliem and Gliem (2003) note that, while an alpha score below .5 is regarded as unacceptable, there is no specific threshold. Scales with fewer items will have lower alpha values. Lower reliability scores for psychological constructs may also be acceptable because of the inherent diversity within them (Kline 1999). Thus, Factor 3, containing three variables and with a Cronbach’s alpha of .606 was retained.

Social integration scale						
Item	Item descriptor:	Communality	Factor loadings			
			1	2	3	4
13	I keep in regular touch with my old friends	.810	.889			
3	My old friends still contact me as much as they did before I came to university	.784	.882			
19	Now I’m at university, I don’t stay in such close touch with my old friends	.728	.834			
8	Now that I’m at university I contact my old friends less often	.718	.816			
17	I rely on my old friends for support	.412	.619			
1	I enjoy my social life at university	.717		.817		
25	I don’t feel part of the university community	.669		.699		
5	I stay in touch with my new friends by mobile phone	.640		.698		
16	I feel that I belong to the university community	.647		.657		
12	There is at least one member of staff I could ask for support	.691			.814	
21	Staff are not supportive to me	.578			.745	
4	I think that some members of staff recognise me outside the classroom	.598			.547	
11	Belonging to university clubs or societies is not important to me for making friends	.784				.875
18	I have made new friends through belonging to university clubs or societies or the students’ union	.618				.601
Eigen values (post-rotation)			3.344	2.276	1.911	1.261
% variance explained			22.2	15.2	12.7	8.4
Scale reliability estimates		Total scale	.868	.742	.606	.342
Coefficient alpha:		$\alpha = .700$				

Kaiser-Meier-Olkin measure of sampling adequacy = .748

Table 1 Principal Components Analysis results: factor loading and reliability estimates

A correlational analysis amongst the three factors showed no relationship between Factor 1 and either of the other two factors, and a weakly positive relationship between Factors 2 and 3 ($r = .238, p < .01$). This outcome provides some support for the independent nature of the three components. The factors were named according to the underlying common themes. Factor 1 related to relationships with old friends, Factor 2 concerned a sense of belonging to the university and Factor 3 was about students’ perceived relationship with staff.

d. Procedure

At T1 an information sheet and questionnaire were provided to the target group. After an opportunity to seek clarification, students who wished to do so completed the questionnaire. Students were then allocated to groups of 5/6, given instructions for the group poster task,

and advised about available resources and support. One week after submitting their posters, students were invited to complete the T2 questionnaire. Students were later debriefed and informed about the initial results of the study.

e. Analysis

T1 and T2 questionnaire responses were matched. Data were entered into SPSS and screened with descriptive statistics and with reference to plots e.g. histograms and Q-Q plots, to ensure that assumptions of statistical models were met. Internal consistency of scale items was tested. Methodology entailed within- and between-groups analyses. Bivariate tests (t-tests and correlations) and multivariate tests (one and three-way ANOVAs) were used to explore the data.

f. Ethics

The University Ethics Committee gave full ethical approval for the study. Confidentiality, anonymity, informed consent and the right to withdraw were addressed. Non-completion of the questionnaire was deemed sufficient indication of the desire not to participate.

Results

a. Participants

The sample is skewed towards single honours (74%), female (66%) and younger students (89% aged 21 years or less) and is representative of the law student cohort.

Seventy per cent had come to university straight from school or sixth-form college, 6.7% via an access course and the rest after a break in education. All except five are home students. Not taking other qualifications into account, the spread of self-reported UCAS points is shown in Figure 1.

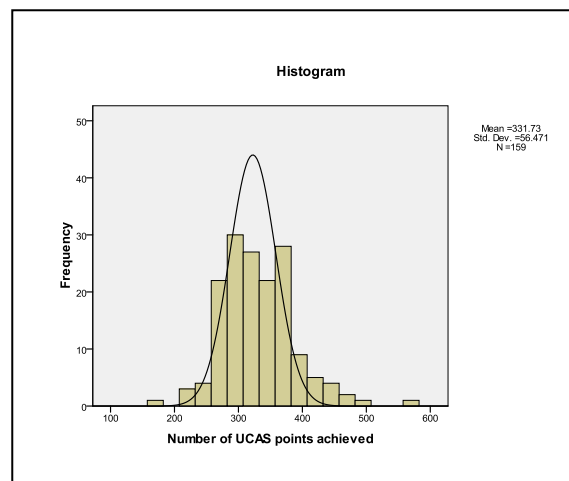


Figure 1 Self-reported UCAS point attainment

Most students live in student accommodation (62%), but a notable proportion live at home (35%). Of 195 students at T1, 74 (38%) had a term-time job and of these, 23% worked for 16 hours+.

b. Scale responses

Descriptive data for all scales and subscales are summarized in Table 2. The mean score for every scale is above the midpoint, suggesting that respondents report higher than average

general self-efficacy, academic self-efficacy, autonomous learning beliefs and social integration. Q-Q plots and Kolmogorov-Smirnov tests indicated that the Independence of learning scale at T2 was not normally distributed and thus non-parametric tests were applied.

N=204	Self-efficacy 1	AL 1 Total	SI1 Old friends Subscale	SI1 Belonging Subscale	SI1 Staff subscale	Self-efficacy 2	CASES	AL2 Total	SI2 Old friends Subscale	SI2 Belonging Subscale	SI2 Staff subscale
Mean	47.5	46.89	18.61	15.41	9.52	46.92	89.22	46.19	18.54	16.19	9.99
Median	48	47	19	15	9	47	90	46	19	16	10
Mode	47	49	20	15	9	49	90	46	19	16	11
SD	5.305	5.547	4.268	2.452	1.925	5.500	11.539	5.498	4.390	2.213	2.129
Range	28	29	20	12	10	32	73	32	17	11	11
Scale midpoint	36	36	15	12	9	36	78	36	15	12	9
Skew	-.287	-.234	-.616	-.505	.015	-.468	-.468	-.034	-.447	-.510	-.417
Kurtosis	.346	.084	-.148	.258	-.163	.394	1.051	.970	-.592	.648	.235
Cronbach alpha	.778	.796	.868	.742	.606	.800	.887	.793	.885	.720	.657

Key: Self-efficacy 1=General self-efficacy scale at time 1; AL1 Total = Autonomous learning scale total score at time 1; SI1 = Social integration subscale at time 1; CASES = College academic self-efficacy scale; Self-efficacy 2, AL2 and SI2 = second administration.

Table 2 Summary of descriptive statistics for self-report scale data

c. Correlations

Correlations for UCAS points and the self-report measures (Table 3) show that UCAS point achievement, which may be regarded as a proxy measure for intelligence, had a weak relationship with only three subscales. This suggests that, while students with higher UCAS points on entry have a greater sense of belonging at university and tend to perceive a less supportive relationship with staff, the impact of UCAS points is minimal.

	S Eff 1	AL1 Total	AL1 Indep	AL1 Habit	SI1 OF	SI1 Belong	SI1 Staff	S Eff 2	CASES	AL2 Total	AL2 Indep (r _s)	AL2 Habit	SI2 OF	SI2 Belong	SI2 Staff
UCAS points						.176*	-.147*							.244**	
S Eff 1		.647**	.623**	.515**		.183*	.231**	.673**	.436**	.536**	.532**	.449**			
AL1 Total			.878**	.880**		.240**	.283**	.542**	.398**	.694**	.576**	.620**			
AL1 Indep				.547**		.274**	.304**	.511**	.353**	.576**	.589**	.391**		.197*	
AL1 Habit						.150*	.194**	.449**	.350**	.649**	.437**	.700**			
SI1 OF						-.149*							.766**		
SI1 Belong							.241**	.202**	.221**	.196*	.267**			.575**	
SI1 Staff								.359**	.227**	.385**	.356**	.303**	.171*		.504**
S Eff 2									.660**	.684**	.627**	.567**		.348**	.267**
CASES										.596**	.577**	.506**		.368**	.369**
AL2 Total											.863**	.884**		.315**	.240**
AL2 Indep (r _s)												.524**		.311**	.194*
AL2 Habit														.250**	.221**
SI2 OF														.194*	.235**
SI2 Belong															.237**

Key: *= $p < .05$; **= $p < .01$ (two-tailed)

Scales: SEff1: pre-test Self-efficacy scale; AL1: pre-test Autonomous learning scale; AL Indep: Independence of learning subscale; AL Habit: Study habits; SI1: pre-test Social Integration scale; SI OF: Old friends subscale; SI Belong: Sense of belonging subscale; SI Staff: Relationship with staff subscale; SEff2: post-test Self-efficacy scale; AL2: post-test Autonomous learning scale; SI2: post-test Social integration scale.

Table 3 Correlation coefficients amongst UCAS points and self-report scale data

General Self-efficacy at T1 relates strongly and positively with general Self-efficacy at T2 ($r = .673$, $p < .01$) and strongly or moderately strongly with Autonomous learning at T1

(Independence of learning subscale: $r=.623$, $p<.01$; Study habits subscale: $r=.515$, $p<.01$). Overall its relationship with T2 Autonomous learning is moderate as is its relationship with College Academic Self-efficacy (CASES) ($r=.436$, $p<.01$). General Self-efficacy at T2 has a stronger relationship with all T2 Autonomous learning scales and with CASES ($r=.660$, $p<.01$). This may simply relate to the timing of scale completion.

The pattern of relationships amongst the scale items was explored using cluster analysis. The cluster method employed 'between groups linkage' and Pearson correlation. The dendrogram shows the close relationship of the autonomous learning subscales together with self-efficacy, and more distant links to the social integration subscales.

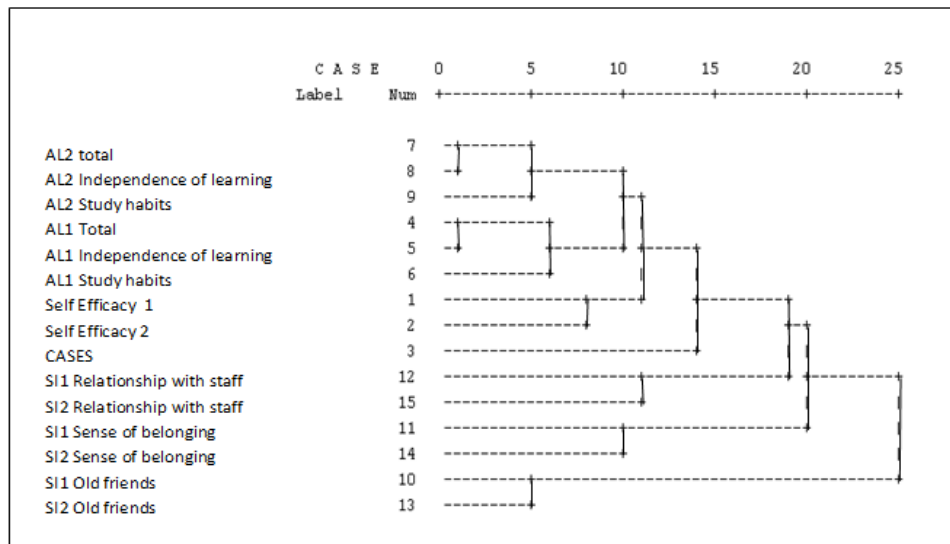


Figure 2 Cluster analysis to demonstrate the relationship amongst scale variables

d. t-tests

Differences in scale responses according to gender, programme, residence and employment were investigated using t-tests.

Both academic ($p<.05$) and general ($p<.01$) self-efficacy were discriminated by gender at T2: female students reported lower efficacy beliefs than male students. LLB/CJ students reported higher general self-efficacy at the start of the course ($p<.05$) but lower academic efficacy at T2 ($p<.05$) than single honours students. There was a general tendency for working students to have higher efficacy beliefs than non-working students: this reached significance at T1 only ($p<.01$).

Autonomous learning scales were investigated using both parametric and non-parametric tests as determined through screening. Study habits reported at T1 were discriminated by gender ($p<.05$), accommodation type ($p<.01$) and having a job ($p<.01$). Female students, students living at home and those with a job indicated a more proactive approach to study. These differences were not shown at T2. Having a job also influenced T1 Independence of learning ($p<.05$).

Female students scored higher on Old Friends subscales at T1 ($p=.05$) and T2 ($p<.05$). This subscale at T1 was also differentiated by accommodation ($p<.01$), with those living at home reporting closer contact with old friends than students living in halls. Relationship with staff was discriminated by programme at T1 ($p<.001$) in that LLB/CJ students perceived greater support from staff than LLB students. Working students also perceived greater support from staff at both T1 and T2 ($p<.05$) as did students living at home (T1: $p<.05$; T2: $p<.01$).

At both administrations, students in halls reported a greater sense of belonging than those living at home (T1: $p < .001$; T2: $p < .05$).

One-way ANOVAs were used to determine if there was at least one significant difference according to age group or primary social support. Whilst a difference was indicated between the oldest group and the youngest in T1 Relationship with staff, with the older group attaining higher scores ($F(2,192) = 3.138, p < .05$), Duncan's test showed that the differences were not significant post hoc ($p > .05$). No differences were found for Self-efficacy or Autonomous learning. No differences were found for these two scales in relation to primary social support. A difference was highlighted in the T2 Relationship with staff subscale ($F(2,144) = 4.524, p < .05$): students with primary support from close family perceive greater staff support than those whose main support came from a partner.

e. 3-way repeated measures ANOVA

Three-way repeated measures ANOVAs were used to investigate the combined relationship of gender, accommodation and primary social support in relation to each of the scales and subscales. Primary social support was the first person listed by respondents to the demographic question 'Who would you turn to first in times of difficulty?' Responses were re-coded into groups comprising immediate family (1), partner (2) or friend (3).

There were no significant interaction effects of the independent variables on general self-efficacy or autonomous learning at either T1 or T2. However, at T2, there is a significant interaction effect of gender and accommodation on Sense of belonging ($F(1,122) = 5.903, p < .05$), such that females living at home have a lower sense of belonging at university than all other groups, as shown in Figure 3.

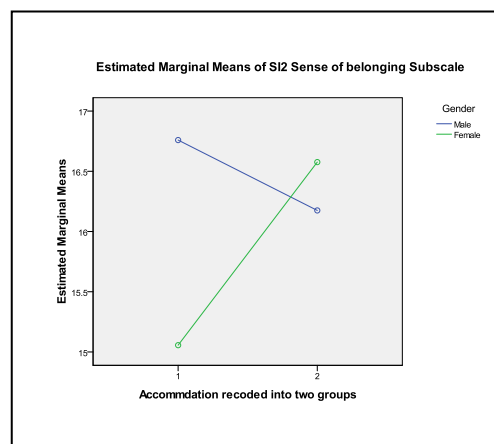


Figure 3 Interaction of gender and accommodation on S12 Sense of belonging

There is a significant interaction effect of gender and accommodation on T2 Relationship with staff ($F(1,122) = 4.518, p < .05$). Males living at home report higher support from staff than those living in halls or than females in either condition.

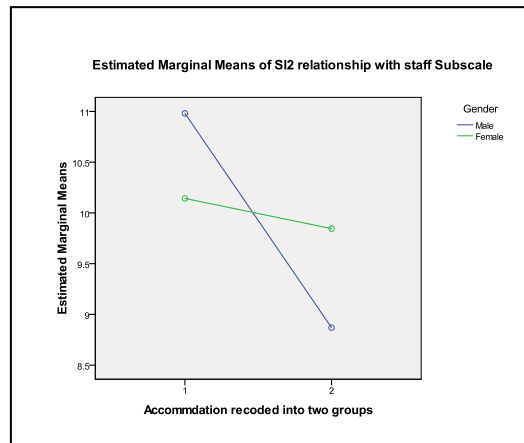


Figure 4 Interaction of gender and accommodation on SI2 Relationship with staff

f. Paired t-tests

Paired t-tests were employed to investigate the differences in means between scale responses at T1 and T2. Results showed that there was no significant difference for self-efficacy from T1 ($M=47.37$, $SE = .432$) to T2 ($M= 47.04$, $SE = .467$) ($t(140) = .913$, $p>.05$). In Autonomous learning subscales, there was no significant difference for Study habits ($t(140) = -.530$, $p>.05$), however there was a significant difference for Independence of learning in that students reported higher independent learning beliefs before the poster task than after it ($z = -2.878$, $p<.01$). Old friends subscale did not exhibit any significant differences, but Sense of belonging was shown to change from T1 ($M= 15.27$, $SE = .197$) to T2 ($M= 16.29$, $SE = .174$) ($t(138) = -5.932$, $p<.001$), as was Relationship with staff (T1: $M= 9.40$, $SE = .150$; T2: $M=9.97$, $SE = .180$; $t(139) = -3.429$, $p<.01$).

g. Comparison of students living in halls of residence and those living at home

%		Live at home	Student accommodation
Age	18 years or less	56	50
	19-20 years	28	38
	21 years or more	16	12
Gender	Female	72	65
	Male	28	35
Programme	LLB	79	71
	LLB/CJ	21	29
Have a job		59	26
Origin	School/6 th form college	72	72
	After a break in education	24	23

Correlations between Self-efficacy and Autonomous learning are stronger amongst home-based students. These students with a higher T1 Sense of belonging indicated higher self-efficacy at T2 ($r=.418$, $p<.01$), and perceived a more supportive relationship with staff at T1 ($r=.535$, $p<.001$) and T2 ($r=.592$, $p<.001$) which was not apparent in students living in halls. Students living at home who reported more contact with old friends at T2 had a greater Sense of belonging at both times (T1: $r=.306$, $p<.05$; T2: $r=.483$, $p<.001$), and a greater perception of staff support at T2 ($r=.323$, $p<.05$).

Students in halls who perceived greater support from staff at T1 had significantly higher autonomous learning scores at both administrations; this was true for home-based students at T2 only ($r_s = .307, p < .05$).

Paired t-tests demonstrated no change in self-efficacy for either group, but Independence of learning beliefs diminished for students living in halls ($z = -2.610, p < .01$). For both groups Sense of belonging increased (Home-based students: $t(48) = -6.190, p < .001$; Students in halls: $t(85) = -2.847, p < .01$), and home-based students perceived Relationship with staff also increased ($t(49) = -3.722, p < .01$).

Discussion

a. Overall, did responses change, and in the expected direction?

We anticipated that Self-efficacy, Autonomous learning beliefs and Study habits, Sense of belonging and Relationship with staff would increase from T1 to T2 but we made no prediction for the direction of change of the Old friends subscale. This was because we anticipated that contact with old friends might decline as students settled into university, or conversely, might not change as more students now live at home.

The results for some scales did not follow our predictions. Self-efficacy and Study habits did not change. Independence of learning beliefs changed in the opposite direction to that expected: students reported *lower* learning beliefs at the end of the task than at the beginning. Amongst the social integration scales, Old friends did not change. However, Sense of belonging and Relationship with staff did confirm our predictions. This was an encouraging indication that students were settling into their course and university way of life, and as a result of their experiences increasingly believe that staff support is available to them.

b. No change in self-efficacy

According to Bandura (1997) self-efficacy increases in response to successfully overcoming a challenge, learning from others' ways of doing things, trying out new things and overcoming anxiety. We thought that we had provided opportunities for students to have such experiences. However, cross-sectional data showed that students generally maintained similar levels of efficacy beliefs and paired t-tests indicated that no significant improvement had occurred at an individual level. One possible reason is that the activities during induction were ineffective: perhaps the poster task was not sufficiently well designed to ensure that there was greater likelihood of success than failure. Another reason may be the organisational difficulties encountered at the beginning of the semester, such as a new registration system which left some students unable to access the university's virtual learning environment or university emails, thus impairing poster-group communication.

It is also possible that the scale used was insufficiently sensitive as general self-efficacy is less reliably measured than situation-specific efficacy (Devonport and Lane, 2006). Pajares (1996) cautions that de-contextualising self-efficacy turns it into a generalised personality trait and as such it may not be predictive. We might have revealed changes by creating a scale specific to the poster and workshop tasks rather than using a generalised scale (Devonport and Lane, 2006).

c. Why did Independence of learning beliefs change in the opposite direction to that expected?

At the time of the first measurement many of the students would be relying on past experience (usually school) to complete the autonomous learning questionnaire. It is often the case that students enter university believing that the skills they have used previously will stand them in good stead at degree level.

However, having experienced a degree-level challenge, students might have developed a more realistic attitude of what was expected of them and so completed the second questionnaire with this recent experience in mind. A study by Goldfinch and Hughes (2007) found that having lower initial confidence in written communication skills was a predictor of success in the first year. They suggest that over-confident belief in skills may be more of a problem for first-year students. We had hoped that the transition process would increase students' awareness of the demands of university – but we did not anticipate a negative influence on self-belief. Further investigation established that joint-honours students were more affected. This finding may be associated with their demographic profile as this group tended to be older and had breaks in education, but additional study is needed to discover why this occurred.

d. The importance of academic staff during transition

Those students who perceived greater support from staff at T1 reported higher self-efficacy autonomous learning beliefs and study habits at T2. The perception of staff support strengthened by T2 and at this point, students who perceived greater staff support reported higher academic efficacy and a greater sense of belonging. This accords with the findings of several studies (Thomas 2012; Vinson et al 2010). In a three year survey of 22 institutions, Thomas (2012, p.8) found that the early development of the academic relationship between staff and students promotes engagement and success in higher education.

e. Do demographics provide an alternative explanation?

In contrast to Goldfinch and Hughes (2007), the independent variables in this study had some effect on findings. We identified three demographic factors that may have influenced the outcomes alongside our interventions – gender, work and accommodation.

Harrop, Tattersall and Goody (2007) ascertained that female students had greater difficulty in developing confidence in their academic abilities than their male colleagues. Our findings support this in that female students tended to report lower general and academic self-efficacy than males at T2. The scores suggest that our interventions had both encouraged men to raise their beliefs in their abilities, and that the experiences had a negative effect on female students' self-efficacy. Female students reported better study habits than men, which is also supported by extant literature (Truman and Hartley 1996). Working students also entered university with significantly higher general efficacy and study habits, but by T2 the results for non-working and working students were similar: the self-efficacy of working students reduced slightly over the period of the study. The confidence gained though work may have been felt to be less transferable to academia by T2.

Students living at home reported a lower sense of belonging than students living in halls at T1, but this reduced by T2 suggesting that the interventions may have been more important for those living at home. They miss out on activities and support which helps students in halls to settle into university before T1 and may feel more integrated.

Limitations of the study

Further study is needed to help us understand the effect of interventions. Measuring changes across the year would help us to identify which processes are affecting different aspects of student development and at which points in the transition process.

Applying our findings to other student groups and discipline areas needs to be explored. However, we had a good response rate and the outcomes are likely to be representative of this cohort of students. Also, we could develop a more effective specific scale to measure efficacy in this transition period (Schunk 1991). Development of the social integration scales is at a rudimentary stage, and will need to be further developed.

While quantitative data is useful in describing a situation at a point in time, it does not provide a full explanation. We were able to identify 'what' was happening but not 'why'. There are likely to be other elements of the students' experience which were not accounted for in this study. Further investigations using focus groups would be useful to explore student's conceptions of transition e.g. demographic effects.

Conclusion

Before this study we were reasonably confident about identifying 'success factors' for performance and retention, but were only able to speculate when such factors were taking effect and whether our interventions were responsible. Now we have begun to understand the effects of our interventions during this crucial stage of the student life-cycle – and that they do not always conform to our expectations. The inevitable conclusion is that we have a lot more to learn.

The most positive aspect is the finding that the poster project and tutor-led seminars predominant in this early part of transition coincide with developing social integration including a sense of belonging and relationship with staff. As Thomas (2012, p 6) suggests: 'the heart of successful retention and success is a strong sense of belonging in HE for all students.' We are now more confident that our poster task and tutor-led workshops are effective in developing working relationships with peers and staff. We confirm evidence in previous studies that academic staff play a vital role in ensuring successful transition (Owen 2002). The small group model in ILL with a specified personal tutor, augmented by one-to-one feedback on the poster task by the module leader, appears to help students to integrate and develop confidence.

There is evidence that may contradict Tinto's suggestion that pre-existing personal relationships need to be partially severed in order to thrive at university. This study shows that those students who maintained old relationships were more likely to feel a sense of belonging and supported by staff. This may be influenced by two factors - the use of communication media to maintain old friendships and increased numbers of students living at home.

We were initially disappointed that our strategy did not appear to enhance self-efficacy and independent learning beliefs as we had hoped. The lack of development at T2 might be related to students becoming more realistic about the demands of university as they move through the transition process and recognise that greater preparation and understanding is required.

Some demographic trends require further investigation. At T2 female students reported lower perceptions of general self-efficacy than male students, although the academic self-efficacy of female students living in halls was higher than that of female students living at home. This suggests that we need to focus on the latter group, particularly as this group's

Independence of learning beliefs also reduce over time and they have a lower sense of belonging than all other groups at both T1 and T2.

The piloting of a new social integration scale seemed to provide satisfactory results in that it reliably showed that differences exist in relation to maintaining old friendships, perceptions of staff support and sense of belonging. We plan to develop the scale further as social integration is a key component of early transition.

Our results tend to favour a 'longer' transition strategy. Previous research has shown that first-year students are more likely to be successful if they develop factors favourable to success including self-efficacy, independent learning and social engagement. Our study suggests that these factors develop at different rates in the initial weeks at university. Our strategy appeared to be successful in supporting the development of social engagement in the first five weeks but not self-efficacy, whereas a previous study showed that many students developed greater self-efficacy over the first semester (Brooman and Darwent 2012b). This suggests that a transition strategy should contain a range of student-centred interventions designed to provide more than one opportunity to develop factors influencing success. This 'longer' process is more likely to improve 'transitional ergonomics', strategies that are more likely to meet the individual needs of each first-year student.

We would not suggest that a 'longer process' needs, necessarily, to be a single event that takes most, or all, student contact time in the first few weeks at university (Vinson et al 2010). Our transition model successfully runs alongside other core subjects in the first semester. A further recommendation is that similar interventions could be extended into substantive subject areas as development does not need to take place in an isolated single module.

We cannot assume that transition processes are effective. It is clear that more research needs to be carried out to justify the resources committed to transition and to avoid uncontrolled 'scattergun' interventions. We need to know more about how interventions work and what they achieve. Even if broad measures such as retention rates seem to improve we should not be complacent and avoid detailed scrutiny - as one student reported when evaluating their own experience of our transition process:

'I don't want you to think that it was perfect, 'cause it wasn't.'

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