

# Students' Engagement in First-year University

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## Abstract

This paper reports on seven calibrated scales of student engagement emerging from a large-scale study of first year undergraduate students in Australian universities. The analysis presents insights into contemporary undergraduate student engagement, including online, self-managed, peer and student-staff engagement. The results point to the imperative for developing a broader understanding of engagement as a process with several dimensions. These must be acknowledged in any measurement and monitoring of this construct in higher education. The paper calls for a more robust theorizing of the engagement concept that encompasses both quantitative and qualitative measures. It considers implications for pedagogy and institutional policy in support of enhancing the quality of the student experience.

## Running head

First-year student engagement

*Key words:* student engagement, first year experience

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## **Exploring the dynamics of student engagement in the first year**

This paper presents fresh insights into campus-based Australian students' engagement during their first year of university study. Based on data collected during a recent national study, it defines seven dimensions of students' engagement with their university study and learning community, and exposes the dynamics and distributions of these phenomena in the first year student population. The analysis contributes to a broader understanding of contemporary student engagement, and through this, mounts a compelling argument for ongoing research into student engagement in the first year of undergraduate study.

Student engagement focuses on the extent to which students are engaging in activities which higher education research has shown to be linked with high quality learning outcomes. Reflecting the work of Astin (1985, 1993), Pace (1995) and Chickering and Gamson (1987), Hu and Kuh (2001, p. 3) define engagement as "the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes". The phenomenon has achieved recognition in the last decade as a cogent means of guiding higher education research policy and practice.

### ***Student engagement in the first year***

Research on student engagement is underpinned by the constructivist view that education is fundamentally about students constructing their own knowledge. From this perspective, learning also depends on institutions and staff generating conditions that stimulate and encourage student involvement (Davis & Murrell, 1993). Engagement is a broad phenomenon that encompasses academic as well as selected non-academic and social aspects of the student experience. At a certain level of analysis, engagement is taken to provide a singularly sufficient means of determining if students are engaging with their study and university learning community in ways likely to promote high quality learning.

The concept of engagement embraces a specific understanding of the relationship between students and institutions. Institutions are responsible for creating environments that make learning possible, that afford opportunities to learn. The final responsibility for learning, however, rests with students. The nature and degree of learning is dependent on how the student makes use of their environmental resources. Astin (1985) and Pace (1988) concur that an individual's involvement or quality of effort plays a central role in determining the extent and nature of development and learning at university. Student engagement develops from the dynamic interplay between student and institutional activities and conditions.

While student engagement tends to be viewed as a quintessential reflection of learning processes, there is an important sense in which such involvement is one of the more significant outcomes of first year study. Indeed, fostering engagement in key educational processes is a crucial means of establishing the foundations for successful later year study (Astin, 1993). Further, the large-scale and highly normative nature of assessment in the first year may mean that measures of engagement provide a relatively good index of academic involvement and potential.

Working from this perspective, the current study reinforces the primary educational role played by engagement. Indeed, it goes further in this direction than most other studies of engagement. Despite the emphasis placed on engagement, most studies of the phenomenon

consider its relationship with academic achievement, and in particular to students' own perceived learning and developmental outcomes (NSSE, 2005a; Pace, 1979; Astin, 1993; Kuh, 1995). In such circumstances, engagement variables are typically treated in statistical models as explanatory or mediating variables used to predict social, cognitive and affective outcomes. For current purposes, however, it is assumed that, while engagement may mediate the influence of these other phenomena, engagement also plays more than a mediating role. That is, engagement is taken to be more than a phenomenon subordinated to the effects of other variables. While it may be going too far to suggest that engagement be conceptualised primarily as an educational outcome, our analysis below suggests that engagement is a phenomenon worth examining in its own right.

In studying engagement, it is necessary to assume that it is possible to identify a range of beneficial activities and conditions associated with learning. It is more difficult, however, to identify these processes and contexts as being necessary, sufficient or, at least, enriching for learning. One reason for this is the lack of suitable outcome measures which has meant that, so far, engagement research has relied on student self-reported outcomes. However even if phenomena could be identified by principle or experiment, the complexity and individualised nature of the educational endeavour would make accurate and reliable generalisation difficult. Indeed, what is meant by 'involvement' may vary between individuals and situations. As Pascarella (1991, p. 458) notes, change at university is dependent on a "dynamic web of influences". For an understanding of involvement to carry any explanatory power, it must focus on the circumstances and conditions understood to be quite fundamental for certain types of learning.

Student engagement has been the focus of a substantial amount of research in the last few years, particularly in the USA (Kuh, 2001; Fredericks, Blumenfeld, & Paris, 2004), the UK (Mann, 2001) and Australia (Krause, et al., 2005; Coates et al, forthcoming; UWA, 2005). The most polished framework appears to be that which has been developed for the National Survey of Student Engagement (NSSE, 2005a), based in the United States. For the purposes of providing aggregate reports to institutions, the framework divides student engagement into five dimensions: level of academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment. While no doubt related, it is proposed that these dimensions capture a necessary and sufficient range of the educationally important qualities of the university student experience. Although it was built on decades of research (Astin, 1985, 1993; Pace, 1979; Chickering & Gamson, 1987), the NSSE framework was the first developed explicitly as a model of university student engagement. It has become widely integrated into higher education practices and policies in the United States.

In a recent study, Coates (2006) proposed that campus-based early-year students' engagement with their study should be conceptualised in terms of nine qualities: constructive teaching, supportive learning environments, teacher approachability, student and staff interaction, academic challenge, active learning, collaborative work, beyond-class collaboration and complementary activities. Recognising that online learning plays a formative role in contemporary campus-based study, Coates also proposed seven qualities of the online dimensions of campus-based study: online engagement, online active learning, online academic relevance, online teaching, online collaboration, online social interaction, and online contact with staff. Analysis of the general and online scales in the Coates study suggested that they were underpinned by a common typology which provided an interpretive context for diagnosing and benchmarking levels of student engagement.

Working from these earlier studies, a primary focus of our analysis in this paper is the definition of key qualities of Australian students' engagement with their first year of university study. Evidence of the importance of the first year in determining student persistence and success in higher education abounds in the research literature. Understanding the first year experience plays a critical role in managing transitions to tertiary study, retaining students (Krause, 2005), and in setting up the educational foundations for academic success (Kuh et al., 2005; Upcraft et al., 1989). The Australian first year experience studies have made a significant contribution in this regard.

### ***The Australian first year experience studies***

The Australian first year experience studies began in the mid 1990s to collect data to assist in the monitoring and enhancement of the quality of university education. The first study in 1994 (McInnis & James, 1995) was commissioned as awareness grew of the impact of student diversity in a mass higher education system. There was a growing recognition at the time of the formative role of the first year experience in shaping student attitudes and approaches to learning. The 1999 study (McInnis, James & Hartley, 2000) provided an opportunity to repeat the 1994 research, using a slightly modified questionnaire but with a student sample selected from the original seven universities. The 2004 study (Krause et al., 2005) built on the tradition set by the early studies, although the sample of institutions was enlarged to enhance its representativeness at the national level. In line with international research trends, the questionnaire was modified and updated to incorporate new questions on the use of information and communication technologies (ICTs), and to explore more fully the issue of student engagement.

This paper reports data from the 2004 study first year study that included a special focus on engagement. Specifically, we report psychometric results from our analysis of the first year engagement scales, and locate these scales in salient research contexts. These data have the potential to inform understanding of many aspects of university life, such as student affairs, pedagogical quality, recruitment and selection, attrition and retention, equity, and student learning processes. The analysis also makes a broader contribution to higher education research by developing a strong case for regular national studies of the first year student experience which include a focus on student engagement.

### **The national survey approach and analysis**

#### ***Survey methodology***

One of the notable strengths of the first year studies is that they provide statistical estimates which are relevant across numerous Australian universities. In 2004, the First Year Experience Questionnaire (FYEQ) was mailed to a 25 per cent random sample of first year commencing undergraduate students, stratified by eleven defined broad fields of education, chosen from each of thirteen participating public universities in Australia. The project asked institutions to select campus-based students who were first time entrants to higher education enrolled in bachelor, associate degree or undergraduate award programs. The sample included domestic and international students enrolled in full-time study. Students in non-award and enabling programs were excluded from the sample. One exception to this was the Indigenous student sample. In order to increase the sample size,

all Indigenous first year students in the participating universities were surveyed, regardless of program type.

The first mailout of questionnaires took place in July 2004 – the second half of the academic year. A second mailout to non-respondents occurred one month later in August. A small incentive of five \$50 gift vouchers was offered to students who wrote an email address on a separate front cover of the survey for inclusion in a prize draw. The students were assured that the address would remain confidential and would in no way connect them to their responses. A total of 3542 useable surveys (33 per cent) were returned. The response rate across institutions varied from 23 to 33 per cent.

### ***Data analysis and scaling procedure***

The engagement scales were defined using a range of psychometric procedures. Initially, exploratory statistical and thematic analyses were conducted to form the FYEQ items into educationally significant groupings. These groupings were informed by analysis of relevant research on student engagement and the first year experience. The face validity of these item groupings was established through consultation with subject-area experts, and names were developed for each scale. Alpha reliabilities for each scale were calculated. Factor analyses were used to establish the construct validity of each scale. Maximum likelihood estimation was used with varimax rotation. Factors with eigenvalues greater than one were extracted. For the purposes of analysis, scale scores were calculated using a percentage metric. Univariate and bivariate descriptive methods were used to generate the results reported below.

### **Results**

The First Year Experience Questionnaire (FYEQ) included items intended to function both as discrete indicators of student learning processes, and as elements of calibrated engagement scales. This section reports the psychometric and empirical properties of the seven engagement scales. It also records the relationships among the scales. A discussion of the composition of each scale follows in the next section.

### ***Psychometric properties of the first year engagement scales***

Table 1 reports summary measures of construct validity and reliability for each of the seven FYEQ engagement scales. As shown, the seven scales are as follows: Transition Engagement Scale (TES), Academic Engagement Scale (AES), Peer Engagement Scale (PES), Student-staff Engagement Scale (SES), Intellectual Engagement Scale (IES), Online Engagement Scale (OES) and Beyond-class Engagement Scale (BES). Table 1 shows the loading of each item on the common construct ( $\lambda$ ), the percentage of variation explained by the items ( $\sigma^2\%$ ), and the alpha reliability of each scale ( $\alpha$ ).

Only a single factor was extracted for each scale. This, along with the shared variance estimates, indicates that each scale explains a significant amount of variance in the items. Table 1 shows that the standardised loadings of the items on their respective scales are very high. The reliability of most scales is above 0.70, a value often used as a benchmark for scales used in largescale survey work.

INSERT TABLE 1 ABOUT HERE

### *Empirical properties of the engagement scales*

Table 2 presents information about the national distributions of first year engagement. It shows scale means ( $\bar{X}$ ), standard deviations ( $\sigma$ ), minimums (min) and maximums (max). While there is variation in the mean scores of the scales, most lie between 60 to 70 per cent. The exception is the OES, the Online Engagement Scale, which has a mean at least two standard deviations of about 30 points lower than the others. The standard deviation figures are fairly uniform, around 15 percentage points, with the exception of AES. The scores generally run across the full range of percentage metric.

INSERT TABLE 2 ABOUT HERE

Table 3 shows the correlations among the first year engagement scales. The TES is a particularly useful tool for interpreting student involvement across a broad spectrum of engagement activities. This scale is positively correlated with the SES, a measure of staff-student engagement, the BES, which monitors student engagement beyond the classroom, and the IES which gauges students' intellectual engagement with their learning in the first year.

INSERT TABLE 3 ABOUT HERE

### **Discussion**

This section focuses on patterns recorded by the first year engagement scales and provides a rationale, informed by cogent literature, for the formation of each scale. The seven engagement scales shown in Table 1 are discussed in turn.

#### *Transition Engagement Scale (TES)*

This scale comprises items that measure the extent to which first year students engage with university life and experiences during the transition process. The transition to university is a complex and often difficult period of a young student's life (Booth, 1997; Kember, 2001; Krause, 2001). The Transition Engagement Scale (TES) gathers first year student views on three dimensions of the transition process. First it evaluates the success with which their institution's orientation program achieved the goals of connecting students to people and services to support their learning and experience as a whole. Many institutions now provide orientation programs in an effort to acquaint students with peers, staff and the services of the university learning community. These activities are typically optional in Australian institutions but their common goal is to help students develop a sense of belonging and to provide them with important information on how to succeed at university.

A second dimension of transition to university involves course advice and student decision-making regarding subjects or units of study. For many students, this can be a particularly difficult process with significant consequences. The pressure is particularly marked in Australian and UK universities where the majority of first year students must commit to a discipline-based degree program at enrolment. If students receive incorrect advice or make inappropriate subject choices, this may impede their progress through a course and, in many cases, may entail additional financial costs. Helpful course and subject advice is a key to enhancing successful transition and student satisfaction in the first year.

Three items in the TES pertain to student satisfaction with regard to subject advice, choice and decision-making.

A third area of the TES focuses on student identity and whether their expectations have been met. Transition is a time during which students develop their identity as a university student and come to terms with whether or not university life is what they expected it to be (see Kuh, Gonyea & Williams, 2005). The TES includes two items that provide students with an opportunity to reflect on the ‘goodness-of-fit’ between themselves and the university. One of the reasons students’ find transition to university so tumultuous is that it often challenges existing views of self and one’s place in the world. Many students from disadvantaged backgrounds, for example, experience significant culture shock on entering an institution whose practices and traditions are alien to them (Forsyth & Furlong, 2003). Transition is a time of identity re-shaping and coming to terms with whether expectations about university life have been met, or need to be revised, or in fact, if the mismatch between expectation and reality is too great to warrant persistence.

Table 3 demonstrates that the TES is a particularly useful tool for interpreting student involvement across a broad spectrum of engagement activities. This scale is most positively correlated with the Student-staff Engagement Scale (SES). This supports the well-established argument for the importance of academic staff involvement in the lives of undergraduate learners early and often, both within and beyond the classroom (Pascarella & Terenzini, 2005). The effectiveness with which students engage with the transition process is also notably connected to their intellectual engagement and their out-of-class experiences. These include interactions with peers for reasons other than class assignments and involvement in extra-curricular activities. These data powerfully illustrate the need for a more holistic view of student engagement in the first year that embraces both academic and social dimensions and their role in promoting successful transitions.

### *Academic Engagement Scale (AES)*

Developing the capacity to manage one’s time, study habits and strategies for success as a student is foundational to success in the first year. First year students need to adjust to paradigm shifts – from subject study at school to discipline-based study at university. In many cases, this represents a diminution of instructivist structures present in school contexts, and demands more self-directed and independent approaches to academic work. The extent to which students undertake key learning activities indexes whether this shift has occurred, and provides evidence of success in managing the many dimensions of their academic work.

The AES attributes agency to the student rather than the institution. Self-awareness and agency are formative first steps in developing as a self-managed learner. The AES comprises items pertaining to self-initiated study behaviours, contributions to class discussions and patterns of attendance. NSSE (2005b) interprets some of these behaviours (e.g., I regularly ask questions in class) as evidence of the “active and collaborative learning” benchmark, while time devoted to study and related activities is included in the “academic challenge” benchmark. Importantly, however, the AES also includes an invitation for students to make a self-assessment about strategic workload management and assistance-seeking behaviours. While self-reported judgements of this kind have their limitations, taken together with the suite of engagement scales presented here, they provide

valuable insights into both attitudinal and behavioural patterns that form the basis for engagement as a self-managing, independent learner at university.

### ***Peer Engagement Scale (PES)***

Developing knowledge in collaboration with peers plays an important role in individual knowledge construction. Such collaborative activity is reflected in contemporary anthropological theories of situated or distributed learning which suggest that individuals learn by involving themselves in fields or communities of practice or inquiry (Hutchins, 1995; Lave & Wenger, 1991). It is reflected in Laurillard's (2002) idea that academic learning involves a continuing and iterative dialogue between teacher and student.

The research literature widely acknowledges that the more frequently students interact with peers in the learning community in educationally purposeful ways, the more likely they are to engage with their learning (Gellin, 2003; Terenzini et al., 1999). Collaboration confers a range of direct and indirect benefits on learning. It can contextualise knowledge in a conversational context, extend material outside 'formal classroom' settings, build learning-centered networks, allow individuals to demonstrate their knowledge, expose the negotiated and generative nature of knowledge, and, not least, enhance interpersonal skills.

Together, NSSE (2005a) and Coates (2006) identify key collaborative activities as central to student engagement. These are summarised in the PES which comprises three contexts in which such engagement occurs: in class, beyond the formal class setting, but with connections to it, and in the broader learning community. The out-of-class elements of engagement relate to studying and working on group assignments together. Another dimension of out-of-class engagement is the trading of course notes and working through course-related difficulties together. Two learning community items are included in this scale. They provide insights into students' global judgements about attitudes and values pertaining to their experiences within the broader learning community. This may include their experience within an academic department or faculty, or possibly beyond this to a more global judgement of the university campus learning community.

### ***Student-staff Engagement Scale (SES)***

The SES reflects the critical role academic staff play in helping first year students to engage with their study and the learning community as a whole. A substantial body of research exists on this substantive aspect of the first year experience (Astin, 1993; Pasque & Murphy, 2005; Terenzini et al., 1996). The SES taps into key qualities of this dimension of the student experience (see Table 1). For instance, several items focus on students' perceptions of the interest that teaching staff show in student progress. One manifestation of this interest is evident in empathetic attitudes and behaviours on the part of academics who take a personal interest in their students. A second manifestation of concern is encapsulated in a series of items relating to how teachers provide feedback on student progress. A final contributor to student engagement with academic staff is students' perception of staff skill in the classroom and enthusiasm for the subject.

Importantly, this scale comprises both behaviours and attitudes and perceptions. An example of the latter is a new item included in the FYEQ in 2004: "I feel confident that at least one of my teachers knows my name". Student perceptions of the learning environment and the commitment of academic staff to supporting student learning have a

profound influence on student satisfaction and sense of belonging in the learning community. It must be acknowledged that many of the items in this scale are common to the Good Teaching Scale in the Course Experience Questionnaire (McInnis et al., 2001). This paper by no means seeks to replace such existing scales. Rather, it proposes these engagement scales as a tool to complement existing measures aimed at a refined and rigorous understanding of the nature of engagement in the first year and how best to monitor and enhance it.

### ***Intellectual Engagement Scale (IES)***

The importance of intellectual engagement early in the first year is widely acknowledged (Kuh et al., 2005; Ramsden, 2003), playing an obviously key role in any form of academic work. Unless they are challenged and challenging themselves to learn, it is unlikely that students are extending the frontiers of their knowledge, or forming meaningful, stimulating and enduring commitments to their study. Intellectual engagement, in short, facilitates the development of cognitive and affective foundations for academic success.

The first year IES provides students with a vehicle for expressing their motivation for and satisfaction with study. It probes students' views on the extent to which their subjects provide intellectual stimulation and challenge. The scale also comprises a global assessment of students' views on the level of intellectual stimulation in their course after almost one year of study.

### ***Online Engagement Scale (OES)***

Online experiences have come to play a critical role in contemporary campus-based learning (Coates, 2006). This scale reflects three main ways in which first year students engage online. The first set of items refers to use of the web and computer software to support learning and access resources. The second group of items focuses on the role of ICTs in promoting independent and self-initiated learning. The third dimension of online engagement in this scale is that of communicating and building community using ICTs. The power of ICTs to connect individuals and communities of practice is widely touted (Burnett, 2003; Clarke, 2002), however much is yet to be done before ICTs can be said to be effectively creating online communities in higher education (Krause, forthcomingb).

Laird and Kuh (2004) question whether engagement with information and communication technologies (ICTs) should be viewed as a form of engagement in and of itself or whether it simply fosters other types of engagement. This question is foundational to informing higher education practice and policy with respect to student learning. For the purposes of this paper, we propose that student engagement with ICTs represents a separate scale that does not preclude its interaction with and influence upon a range of other behaviours, attitudes and learning experiences. Nevertheless, the fact that the scale mean for the OES (see Table 2) behaves so differently from the rest points to the fact that further work is needed to refine our understanding of how students engage online in the first year, and how best to gather empirical evidence on the nature and effects of their online experiences on learning.

### ***Beyond-class Engagement Scale (BES)***

The student experience literature says much about the importance of students connecting with each other and the university community in activities beyond the classroom, both social and academic (Krause, forthcoming*a*; Pascarella & Terenzini, 2005; Zhao & Kuh, 2004). This scale includes items specifically related to extra-curricular involvement, for example in sporting or cultural activities. It also comprises several items intended to gauge students' sense of belonging and social connectedness with other students beyond the classroom setting.

The item with greatest loading in this scale is that focussing on whether students feel they belong to the university community. A sense of belonging and community on campus is a particularly potent indicator of engagement among commuter students who face many competing forces, including paid work commitments that are off campus for the majority of Australian undergraduate students (Krause et al., 2005). Belonging is fostered when students enjoy coming onto their campus. Friends play a key part in this too. Unlike the PES, the two friendship items in this scale (see Table 1) refer more broadly to the development of friendships and social interactions beyond academic contexts. Extra-curricular involvement in clubs and societies is an important mechanism for developing a sense of belonging on campus. Institutions would do well to monitor student responses to this scale as a means of diagnosing the health of campus life and community through the eyes of first year students. It is important to note that the sample from which these data were drawn did not include students studying by distance. Close study of mechanisms for connecting distance education students to university campuses is a fruitful and important avenue for future investigation.

### ***Relationships between and among the engagement scales***

The correlational data shown in Table 3 provide supportive evidence for the multifaceted nature of successful engagement in university learning communities through exposing divergence between the scales. Successful transitions are closely allied with the extent to which students interact with academic staff, which in turn is related to students' intellectual engagement with learning and learners in the first year. Of particular note is the strong relationship between heightened engagement during the transition process and students' engagement with campus-related out-of-class activities. The sense of belonging they develop as a result of feeling part of the learning community facilitates successful transition experiences.

### **Conclusions and implications**

The work of Kuh and colleagues has drawn international attention to the concept of student engagement and its role in promoting student learning and demonstrating institutional effectiveness. These scales are not intended to replace the extensive accomplishments of NSSE. Rather, they are presented as a complementary tool to be considered as part of a suite of resources available to institutions and their staff in the ongoing quest to understand, monitor and promote student engagement.

Importantly, this paper represents an Australian perspective on engagement, with a particular focus on the first year experience. It draws attention to the importance of developing a broader understanding of engagement as a process with several dimensions. In particular, the Transition Engagement Scale provides institutions and their staff with

valuable insights about the effectiveness of orientation programs and course advice in assisting first year students to make the transition to university life.

The instrument from which these scales were drawn was administered towards the end of the first year. However, in line with Coates (2005), we argue for the need to monitor changing patterns and dimensions of engagement throughout the first year, using a combination of quantitative and qualitative measures. There should also be a focus on both behavioural and attitudinal dimensions of the student experience if institutions are to truly understand the nature of student engagement and how to foster it in the first year. This may be achieved by adding to the existing use of snapshot survey data by incorporating qualitative elements to the data collection through the course of the first year. For instance, resources may be allocated to ensure that every first year student meets with an academic member of staff in their department within the first six or seven weeks of the academic year. In such cases, it may be possible to integrate some of the items from the scales presented here into the interview process. The information may in turn be fed back to academic and student affairs staff, and to students themselves, as part of an ongoing conversation about strategies for enhancing engagement with the institution, with learning, and with the learning community.

This paper confirms the multifaceted nature of student engagement which, as the psychometric validation and statistical modelling has shown, comprises both behavioural and attitudinal dimensions. However, in order to be most useful for shaping policy and practice, it is important to understand how engagement varies across demographic student groups and how it changes over time during the first year and through the undergraduate years. There would also be considerable merit in determining whether these scales hold true for samples of first year students in other countries. These issues will be the focus of future research, as will the exploration of qualitative approaches to measuring student engagement in the first year.

## Authors' Biographies

Kerri-Lee Krause is a higher education policy researcher at the Centre for the Study of Higher education, University of Melbourne. Her research expertise spans broadly across higher education policy areas, but her particular research focus is the student experience in higher education and implications for policy and practice. A significant part of her role involves providing policy and practical advice to university academics, administrators and student support staff on managing and responding to the changing student experience in higher education.

Hamish Coates is a Senior Research Fellow at the Australian Council for Educational Research and a Research Associate at the Centre for the Study of Higher Education. Recent projects include the enhancement of the Australian graduate census, an investigation of student engagement and online learning, development of new scales for the Australian Course Experience Questionnaire, a review the national student equity policy, development of national policy on study abroad and student exchange, and an institutional evaluation of learning management systems.

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Table 1: First year engagement scales

<b>Scales and Items</b>	$\lambda$	$\sigma^2\%$	$\alpha$
<b>Transition engagement scale (TES)</b>		46.85	0.80
The orientation programs helped me feel like I belong in this university	0.76		
The university orientation programs helped get me off to a good start	0.67		
I really like being a university student	0.61		
I was given helpful advice when choosing my subjects/units	0.59		
I was satisfied with the range of subjects/units from which I could choose this year	0.53		
University has lived up to my expectations	0.53		
I am satisfied with the subject choices I made this year	0.52		
<b>Academic Engagement Scale (AES)</b>		25.94	0.67
I am strategic about the way I manage my academic workload	0.52		
I regularly study on the weekends	0.52		
I regularly seek advice and help from teaching staff	0.47		
Time spent on private study	0.47		
I rarely skip classes	0.43		
I regularly borrow books from the university library	0.41		
Time spent in the university library	0.36		
I regularly ask questions in class	0.35		
I usually come to class having completed readings or assignments	0.34		
I regularly make class presentations	0.29		
<b>Peer Engagement Scale (PES)</b>		32.40	0.72
I regularly work with other students on course areas with which I have problems	0.69		
I regularly get together with other students to discuss subjects/units	0.67		
I regularly study with other students	0.61		
Studying with other students is very useful to me	0.58		
I regularly work with classmates outside of class on a group assignment	0.47		
I regularly work with other students on projects during class	0.35		
I regularly borrow course notes and materials from friends in the same subjects/units	0.34		
I feel part of a group of students and staff committed to learning	0.28		
There is a positive attitude towards learning among my fellow students	0.27		
<b>Student-Staff Engagement Scale (SES)</b>		43.36	0.86
Staff make a real effort to understand difficulties students may be having with their work	0.69		
Most academic staff take an interest in my progress	0.69		
The teaching staff are good at explaining things	0.69		
Teaching staff usually give helpful feedback on my progress	0.68		
Staff try hard to make the subjects interesting	0.65		
Most of the academic staff are approachable	0.64		
Staff are usually available to discuss my work	0.64		
Staff are enthusiastic about the subjects they teach	0.62		
One-to-one consultations with teaching staff are useful	0.49		
I feel confident that at least one of my teachers knows my name	0.46		
Staff made it clear from the start what they expect from students	0.45		
<b>Intellectual Engagement Scale (IES)</b>		52.39	0.80
I enjoy the intellectual challenge of subjects I am studying	0.85		
I get a lot of satisfaction from studying	0.74		
The lectures often stimulate my interest in the subjects	0.66		
I am finding my course intellectually stimulating	0.64		
I am usually motivated to study	0.47		
<b>Online Engagement Scale (OES)</b>		35.39	0.85

Online discussion with other students is very useful	0.76		
Using email to contact other students is very useful	0.75		
Online tutoring (electronic access to tutoring support) is very useful	0.70		
Computer software (e.g. CD Roms) designed specifically for the course are very useful for me	0.62		
Using email to contact lecturers/tutors is very useful	0.62		
Subjects offered online with no face-to-face classes are useful	0.57		
Online resources (e.g. course notes and materials on the web) are very useful for me	0.55		
Learning at my own pace using online resources is useful	0.55		
I regularly use web-based resources and information designed specifically for the course	0.49		
I regularly use email to contact friends in my course	0.49		
I regularly use online discussion groups related to my study	0.49		
I regularly use the web for study purposes	0.35		
I regularly use email to contact lecturers/tutors	0.35		
<b>Beyond-class Engagement Scale (BES)</b>		41.00	0.71
I feel I belong to the university community	0.73		
I really like being on my campus	0.59		
I tend to mix with other students at university	0.52		
I have made at least one or two close friends at university	0.50		
I am actively involved in university extra-curricular activities (e.g. cultural, sporting)	0.48		
I am interested in the extra-curricular activities or facilities provided by this university	0.39		

Table 2: National distributions of first year engagement qualities

	$X$	$\sigma$	$min$	$max$
TES	68.67	15.24	14.29	100.00
AES	59.44	9.32	12.77	95.74
PES	62.39	14.10	8.57	100.00
SES	68.41	14.61	3.64	100.00
IES	70.51	15.95	4.00	100.00
OES	44.42	14.38	7.46	91.04
BES	65.83	14.98	3.33	100.00

Table 3: Relationships among the engagement scales

	TES	AES	PES	SES	IES	OES
AES	0.33					
PES	0.36	0.25				
SES	0.53	0.40	0.32			
IES	0.51	0.53	0.20	0.48		
OES	0.16	0.19	0.27	0.13	0.13	
BES	0.50	0.16	0.48	0.29	0.24	0.11