



University of  
New Haven

American Business Review

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Volume 24 | Number 1

Article 5

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5-2021

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Amir Arjomandi  
*University of Wollongong*

Juergen H. Seufert  
*Wenzhou Kean University*

Martin O'Brien  
*University of Wollongong*

L. Celeste Rossetto  
*University of Wollongong*

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### Recommended Citation

Arjomandi, Amir; Seufert, Juergen H.; O'Brien, Martin; and Rossetto, L. Celeste (2021) "An Empirical Study of Business Student Engagement with Active Teaching Strategies: A Comparison of First Year and Senior Students," *American Business Review*. Vol. 24 : No. 1 , Article 5.

DOI: 10.37625/abr.24.1.67-89

Available at: <https://digitalcommons.newhaven.edu/americanbusinessreview/vol24/iss1/5>

# An Empirical Study of Business Student Engagement with Active Teaching Strategies: A Comparison of First Year and Senior Students

American Business Review  
May 2021, Vol.24(1) 67 - 89  
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ISSN: 2689-8810 (Online)  
ISSN: 0743-2348 (Print)

Amir Arjomandi<sup>a</sup>, Juergen Heinz Seufert<sup>b</sup>, Martin O'Brien<sup>c</sup>, and L. Celeste Rossetto<sup>d</sup>

<https://doi.org/10.37625/abr.24.1.67-89>

## ABSTRACT

The quantitative evaluation of student engagement has been difficult to achieve. This study uses Kahu's (2013) conceptual framework to investigate the effectiveness of active teaching strategies and how they influence Business students' engagement in a blended learning environment. First, we quantify the influence of various in-class active teaching activities and out-of-class support tools upon student engagement. The link between engagement and student outcomes in terms of academic results and personal and professional skills development is then captured in our empirical modelling. Results are compared between first year and senior students to understand significant differences in their engagement and experience. Our findings suggest that first year students display a higher propensity to utilize in-class learning activities and out-of-class support tools. This in turn, establishes a strong link with their engagement patterns. However, there is a weaker link between first year student engagement and outcomes compared to senior students. Overall, this study reinforces the usefulness of Kahu's framework to guide curricula developments that cater for learners' different needs.

## KEYWORDS

Undergraduate Teaching, Student Engagement, Active Teaching Strategies, First Year Students, Senior Students, Simultaneous Equations

JEL Codes: A22, C30, I21

## INTRODUCTION

New enrolling students are faced with having to adapt to an unfamiliar learning culture and for international students, this is compounded with living in an unfamiliar country in addition to learning the content and skills required of the academic discipline they have chosen (Scheyvens, Wild & Overton, 2003; Handa & Fallon, 2006). This can have an impact on students' ability to engage with all aspects of university, which inevitably can affect the likelihood of retention and academic success. Student engagement is widely acknowledged to be an important precursor to effective learning and academic success at all levels of education (Korobova & Starobin, 2015; Thomas & Heath, 2014; TEQSA, 2020). As such, improving student engagement is a key strategy to improve the learning experience for students from varied educational, linguistic and cultural backgrounds, by putting more emphasis on diverse approaches to classroom instruction, curriculum, and teaching support (Rogerson & Rossetto, 2018; Engstrom & Tinto, 2008).

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<sup>a</sup> School of Business, Faculty of Business and Law, University of Wollongong; Email: [amira@uow.edu.au](mailto:amira@uow.edu.au)

<sup>b</sup> Department of Accounting, Wenzhou Kean University; Emails: [jseufert@kean.edu](mailto:jseufert@kean.edu) and [jseufert@wku.edu.cn](mailto:jseufert@wku.edu.cn)

<sup>c</sup> School of Business, Faculty of Business and Law, University of Wollongong; Email: [martinob@uow.edu.au](mailto:martinob@uow.edu.au)

<sup>d</sup> Learning, Teaching & Curriculum, University of Wollongong; Email: [celeste@uow.edu.au](mailto:celeste@uow.edu.au)

### Corresponding Authors:

Arjomandi ([amira@uow.edu.au](mailto:amira@uow.edu.au))

Seufert ([jseufert@kean.edu](mailto:jseufert@kean.edu) and [jseufert@wku.edu.cn](mailto:jseufert@wku.edu.cn))

Literature has proliferated on the subject of student engagement and the first-year experience (Krause, 2005; Haggis, 2006; Dewart & Rowan, 2007; Kift, Nelson & Clarke, 2010; Stirling & Rossetto, 2015). This study expands on this research stream by offering a way to actually measure student engagement. For the purpose of this article, the definition by Hu and Kuh (2002, p. 555) of engagement as “the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes”, is accepted. This definition gives a broad scope for interpretation and implementation. In line with the current ambiguity surrounding the concept of student engagement, Kahu (2013, p. 769) notes that although it is impossible for a single research project to take into account all facets of student engagement, the “... clearer our understanding of student engagement and the influences on it, the better positioned teachers and practitioners will be to meet the needs of students, to enhance the student experience, and to improve the educational outcomes”.

Krause (2005, p. 9) exhorts those teaching in higher education “...to provide optimal opportunities for students to not only keep their appointment with their university studies but also to thrive in an engaging and intellectually stimulating environment during that time”. Kahu explicates the need for research that looks into single institutions, with projects focusing on a narrow population since “a broad generalization of the student experience is ill-advised”. With reference to Kahu’s (2013) recommendations, we move beyond existing broad-based surveys (e.g., National Survey of Student Engagement, Australasian Survey of Student Engagement, and Survey of Entering Student Engagement) to analyse the level of engagement in a core Business undergraduate course at an Australian university with a specific focus on the difference between first year and senior students.

Our study compares first year and senior students’ engagement levels as well as their antecedents and outcomes attributed to active teaching strategies. This analysis of students at different stages of the educational process helps us to better understand the complex nature of engagement and the most effective teaching tools for students in various phases of study. Active teaching strategies are defined in this paper as those activities that encourage students’ involvement in the learning process and/or encourage interaction between students or with staff either within or outside of the classroom as opposed to the ‘chalk and talk’ passive method of teacher-centred learning. For example, supported online learning environment (MML), cartoons and videos as discussion points within class, applied activities, and peer-to-peer learning are such active teaching activities in this study.

Three central elements of the Kahu framework - psychosocial influences, student engagement and proximal consequences - are considered since the students and/or institutions have the most influence over these aspects. We measure students’ engagement by considering its three key components: 1) time and effort to learn and engage with learning content; 2) interaction with other students; and 3) participation in learning activities. The relationships between engagement, psychosocial influences and proximal consequences are investigated. We are particularly interested in the role of active teaching strategies as psychosocial influences on engagement, so for this reason it is important to quantify the role of engagement in student achievements that are measured by exam grades and development of personal and professional skills.

Overall, this study augments existing knowledge about the impact of different teaching and learning tools on first year and senior students. The aim is to encourage more targeted applications of educational tools in tertiary education.

## LITERATURE REVIEW

A vast body of literature has been published on different aspects of student engagement with learning and academic success (Carini, Kuh, & Klein, 2006; Kahu, Stephens, Leach, & Zepke, 2015; Arjomandi, Seufert, O’Brien & Anwar, 2018; Kahu & Nelson, 2018). Early research showed the impact of student

engagement on time-on-task, participation (McKinney, Mason, Perkerson, & Clifford, 1975; Smyth, 1980) and its psychological or cognitive implications (Ainley, 1993; Lamborn, Newmann, & Wehlage, 1992; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996). This has led to an increasingly complex analysis of the relationship between students' effort, classroom activities and learning outcomes (Kuh, 2009). To this end, student engagement has even been used as an indicator for the effectiveness of education (Kuh, 1995, 2003; Kuh, Kinzie, Schuh, & Whitt, 2011; TEQSA, 2020; Zumbrunn, McKim, Buhs, & Hawley, 2014), employability (Qureshi, Wall, Humphries, & Bahrami Balani, 2016), and student performance (Buckless & Krawczyk, 2016).

Other studies looked into further engagement factors such as: the impact of student motivation (Schuetz, 2008); the roles of institutional structures and cultures (Porter, 2006); and the content and style of lectures (Almarghani & Mijatovic, 2017; Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006; Manwaring, Larsen, Graham, Henrie, & Halverson, 2017). Recently, rapid advances in technology and how this shapes student engagement has garnered much attention (Dobbins & Denton, 2017; Rashid & Asghar, 2016). Additionally, scholars have studied factors such as international students' communication skills and cultural differences (Caplan & Stevens, 2017; Rogerson & Rossetto, 2018) as well as family influence and support, such as family expectation, financial support, and monitoring of students' academic performance (Asare, Nicholson, & Stein, 2017; Sullivan et al., 2017).

### **ACTIVE TEACHING STRATEGIES AND STUDENT ENGAGEMENT**

Individual consultations with staff have been found as one of the most effective learning modes to engage students, as they benefit substantially in both the learning and development process (Coates, 2009; Farr-Wharton, Charles, Keast, Woolcott, & Chamberlain, 2018; Kuh & Hu, 2001). The quality, not quantity, of time spent with academic staff is of the most relevance where contact in an informal instructional environment with broader intellectual focus and responsiveness to individual students' needs is most effective for learning (Chickering & Reisser 1993; Kuh & Hu 2001). Similarly, active teaching decisions an instructor makes (such as the mode of teaching as online or face-to-face, choice of activity, peer and content interactions) have a stronger impact on student engagement (Almarghani & Mijatovic, 2017; Manwaring, Larsen, Graham, Henrie, & Halverson, 2017).

Active teaching is a pedagogical approach that moves classroom instruction from traditional lecture-oriented format to a student-centred approach learning where students are both critical thinkers and/or generators of knowledge and consumers of knowledge in an active, collaborative, and experiential learning environment (Barr & Tagg, 1995). Targeted classroom activities increase active learning and student engagement (Almarghani & Mijatovic, 2017; Chad, 2012; Krain, 2010). Problem-based and case-based learning enhance students' engagement, more so when documentary films are one aspect of the problem (Krain, 2010). Furthermore, compared to the use of PowerPoint and blackboards, interactive techniques, such as use of tablets and smartphones, increase student engagement (Remón, Sebastián, Romero, & Arauzo, 2017). The use of clicker-based systems (Dong, Hwang, Shadiev, & Chen, 2017), and mobile applications (Dobbins & Denton, 2017) in teaching also increase students' engagement. However, Manwaring, Larsen, Graham, Henrie, and Halverson (2017) found that although peer activities increase students' cognitive engagement in a blended learning environment, they do not increase emotional engagement. Additionally, they found that students demonstrate lower levels of emotional engagement with both active-learning activities and when activities are challenging. Hence, although active teaching strategies increase students' engagement, careful design and delivery is required to enhance students' cognitive and emotional engagement.

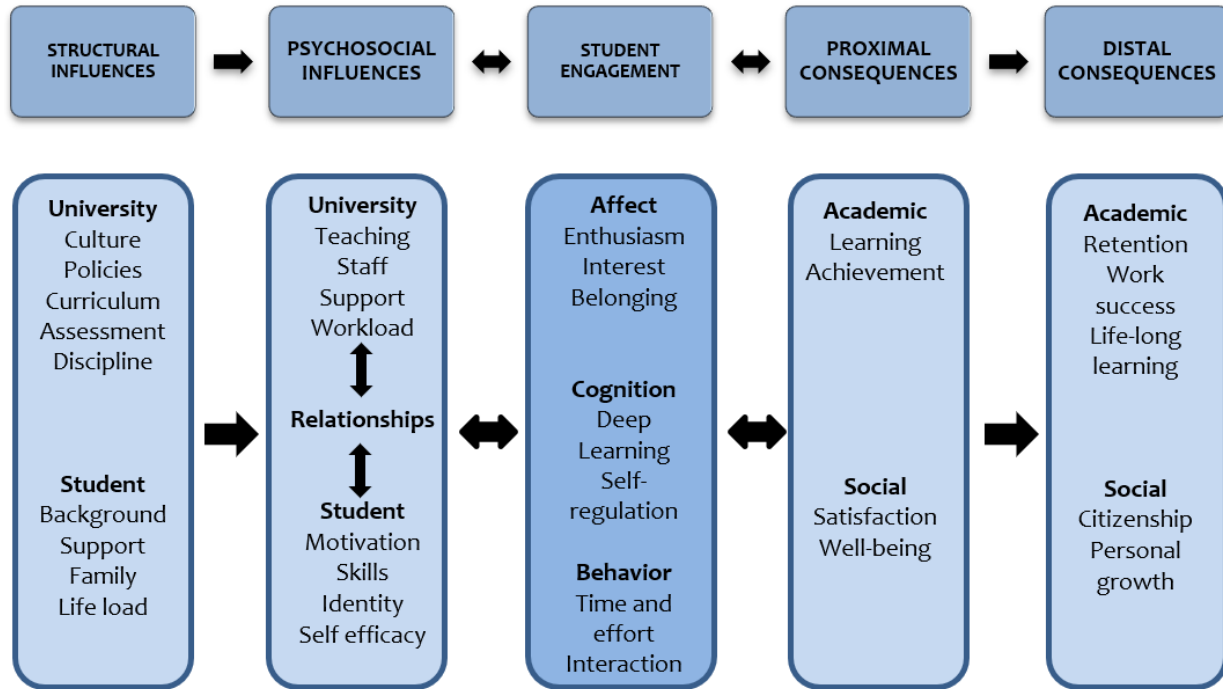
## **FIRST YEAR STUDENTS AND THEIR ENGAGEMENT EXPERIENCE**

The first year of higher education is crucial for students transitioning from their previous mode of secondary education (Krause, 2005; Krause, Hartley, James, & McInnis, 2005). Although there is an increase in tertiary education enrolments, first year students often feel overwhelmed or even isolated (Krause, 2005).

Risk factors affecting the retention of first year students identified in the research literature include delays in starting tertiary education following completion of secondary schooling, studying part-time, being financially independent from parents, taking care of dependent children, and being a single parent (Horn, Peter, Rooney, & Malizio, 2002; Luzeckyj, McCann, Graham, King, & McCann, 2017). In addition, belonging, the amount of support offered, intellectual engagement and workload stress affect students (Naylor, Baik, & Arkoudis, 2017). As well as being detrimental to retention, these risk factors were also found to have a significant negative effect on the academic success (Chen & Carroll, 2005; Choy, Horn, Nuniez, & Chen, 2000). However, the degree and level of 'risk' among such students varied among different student categories. For example, first-generation students had poorer academic engagement (e.g., interactions with the faculty, contribution to class discussions, participation in class discussions, and asking questions in the class) compared to other students and had a lower retention of knowledge (Soria & Stebleton, 2012). Adult students can experience less confidence and may not be prepared for academic transition (Renirie, 2017). Furthermore, older female learners, specifically those with caring responsibilities, are most likely to experience guilt and anxiety around a move into higher education (O'Shea, 2015). Hence, addressing these risk factors is essential to enhance student retention. In order to take into account the above-mentioned factors, we control for variables such as gender, residence, enrolment status, race/ethnicity, having dependents, and hours worked in employment in this study.

## **KAHU'S CONCEPTUAL FRAMEWORK**

Kahu's critical analysis of the literature provided a critique of three existing branches of research, include behavioral, psychological, and sociocultural approaches. While the behavioral approach stresses student behaviors and teaching practices, the psychological approach sees engagement as an internal psychosocial process with behavioral, cognitive and affective aspects. The sociocultural approach highlights the broader social context of engagement. By integrating and extending these three branches, Kahu proposed a comprehensive and coherent conceptualization of engagement underpinned by the assumption that student engagement can be influenced by various factors and is a main prerequisite for not only academic success, but also personal growth.



Source: Kahu (2013, p. 766)

**Figure 1.** Kahu's Conceptual Framework of Student Engagement

As Figure 1 shows, a unidirectional relationship is posited from structural to psychosocial influences as antecedents to student engagement. Structural influences comprise both student and university attributes. Student background, support, family and life load are deemed relevant, as is the university's culture, policies, curriculum, assessment and discipline. Similarly, psychosocial influences are categorized as university (teaching staff, support and workload), and student (motivation, skills, identity and efficacy).

A bidirectional relationship exists between psychosocial influences and student engagement. In turn, student engagement consists of the three concepts of affect, cognition, and behavior. Affect includes attributes such as enthusiasm and students' level of interest in their studies and the sense of belonging they have within the university. Cognition contains the aspects of surface versus deep-learning and self-regulation. Finally, student engagement could be measured by students' behavior, which is time and effort required to learn and engage with their subjects, interaction with other students, and participation in learning activities.

Student engagement can trigger proximal consequences that can lead to an increase in students' engagement, indicating a reciprocal relationship. Proximal consequences are academic or social in nature. Academically, students may have higher achievements (including marks) and a deeper level of learning, while socially they may feel satisfaction from their learning experience and improved well-being. Those proximal consequences can then lead to distal consequences that are either academic or social that include immediate academic success as reflected by retention, work success and life-long learning, as well as other long-term social impacts such as citizenship and personal growth.

Inspired by this holistic conceptual framework, this study investigates the relationship between active teaching strategies with psychosocial antecedents, multiple measures of student engagement, as well as proximal consequences for both first year and senior students.

## **METHOD**

### **THE SURVEY**

The survey was motivated by Kahu's framework and questions are mainly made based on previously employed national surveys such as Australasian Survey of Student Engagement (AUSSE) and academic papers such as Coates (2009), while questions were customized and rephrased to meet the circumstances of the subject and university. The survey was pilot tested by a group of students as well as colleagues to receive their feedback and suggestions to improve the clarity of questions. It was also reviewed and approved by the University's Human Research Ethics Committee.

### **DATA COLLECTION**

Our data were collected from students via an online survey questionnaire (available in the appendices to this paper). Collecting self-reported confidential and anonymous information is a standard method of enquiry into student engagement and has been used elsewhere in the AUSSE and other widely recognized applied surveys within the field of education research. For this evidence to be reliable and valid, certain prerequisites needed to be met (Pike, 2006; Pohlmann, 1976) that include ensuring respondents were aware of information being requested; there was no ambiguity or unclearly phrased questions; activities being investigated were recent; respondents believe there was merit to answering the question; there was a possibility to verify respondents' answers; and finally, the respondents did not feel a threat of embarrassment or violation of privacy by answering the questions. In weeks prior to the survey, students were provided with formal participant information indicating the background, purpose, and demands on respondents as well as the confidentiality provisions. Participation in the study was emphasized as entirely voluntary and anonymous. Students had the option to not answer all questions or to close the survey at any point.

### **THE SAMPLE**

Our survey was distributed to students via the online survey tool 'Qualtrics' in a compulsory core subject for Business students, COMM121: *Statistics for Business*, during a computer-laboratory class in week 10 of first semester 2014. The student enrolment profile consists of both first-year students completing the subject in their initial year as recommended by academic advisors, as well as senior students (sophomore and later) who choose to undertake the subject later in their studies. The response rate was 278 students out of a total of 430 students enrolled in the subject (65%), of which 220 responses were usable (51%). Of these 220 students, 119 were first year and 101 seniors.

### **SUBJECT DESCRIPTION AND STUDENTS' LEARNING OUTCOMES**

The aim of the subject is to introduce students to quantitative techniques and their application to the business world with an emphasis on the decision-making process and comprises business statistics and topics. These include descriptive statistics, probability, sampling, confidence intervals, hypothesis testing, elementary correlation, regression analysis and time series forecasting. Students are also introduced to the use of computer programs for estimation and analysis to improve business decision-making. COMM121 was a face-to-face class, and all lectures were held in a large lecture room. One lecturer and four tutors were in charge of teaching COMM121 lectures and tutorials, respectively. All four tutors were trained to be consistent in terms of the teaching methods used in the tutorials.

## ACTIVE TEACHING STRATEGIES AND SUPPORT TOOLS

Students were provided with various opportunities to be actively engaged in the classroom and outside classroom environment. In-class active teaching activities included in the *teaching* category included applied activities, case studies, humorous videos and cartoons. They were mixed with a brainstorming time that simply used as a strategy to draw out ideas/conclusions and generally engage more students in grappling with the content in a deeper way. Outside the classroom, students had access to a variety of other active teaching tools in the *support* category including opportunities such as attending the peer-assisted study sessions (PASS) program, using an online practicing system (MyMathLab), and reviewing recorded lectures and communicating with each other via Student Forum.

MyMathLab (MML) is a powerful online homework and assessment tool that helps students to practise statistics problems and improve their understanding of concepts through active learning. It is included in both *teaching* and *support* categories as it was used both within and outside of formal classes. MML enabled direct contact between students and instructors; students were able to ask questions from our teaching team while they were completing online practice quizzes, review their answers immediately after submission to improve their understanding of the topics by learning from their mistakes. MML was also used for summative online quizzes.

The PASS program is a free academic assistance program that utilizes peer-led group study to help students better understand the subject materials in an informal and active learning environment. Trained PASS leaders are students who have previously completed this subject with high marks. They use group discussions and students must answer questions through group activities. Students also had the opportunity to review recorded lectures (through ECHO360) and communicate with each and the teaching team via Student Forum to ask their questions (during or after the lecture) in order to better understand the subject materials. By providing these various tools and support, we created a rich teaching environment to encourage students to be involved in the learning process through the teaching team and also from each other.

## THE ANALYSIS

In addition to the engagement scale from AUSSE, a set of psychosocial antecedents, measures of engagement, and proximal consequences were selected from Kahu's conceptual framework of student engagement framework for the analysis. Appendix Tables A1–A3 list the specific survey categories and questions that contributed to each scale. We probed the possible relationship between student engagement and psychosocial influences that include: (1) provided *support*, (2) active *teaching* materials and facilities, (3) subject and university *workload*, and (4) student *motivation*. Our active teaching strategies within the classroom are mostly captured in the *teaching* category, while other elements at the institutional or peer to peer level are captured in the *support* and *motivation* categories. Finally, we investigated relationships between student engagement and proximal consequences that includes academic achievement and self-reported gains in personal and professional attributes.

We use two statistical tools for our analyses. First, two population hypothesis testings (assuming independent samples and unequal population variances) are used in Table 1 to determine if there are any statistically significant differences between first year and senior students in various measures of psychosocial influences, student engagement, and proximal consequences. Second, we use a simultaneous equation system and a two-stage least squares estimation method to estimate the influence of psychosocial influences upon engagement, and then the influence of engagement upon student outcomes as follows:



$$Engagement_i = f(\text{support, teaching, workload, motivation, student controls}) \quad (1)$$

$$Student\ outcome_i = f(\text{engagement, student controls}) \quad (2)$$

Engagement is considered as an endogenous variable. We are interested in its role in influencing student outcomes, but are keenly aware that there are a number of influences upon engagement itself. If we were to ignore this endogeneity issue and estimate our two equations independently, our estimate of the engagement slope coefficient in equation 2 would suffer from simultaneous equation bias. To avoid this issue, the two-stage least squares method generates a prediction of engagement from our first equation, with this predicted value of engagement included in the second equation in place of the actual value. In addition, a number of control variables were used to account for risk factors and demographic characteristics such as gender, part-time student status and being from a non-English speaking background. Equations are estimated separately for first year and senior students to enable us to: firstly, differentiate heterogeneous behavior; and secondly, discover the most effective tools or teaching strategies to improve students' learning outcomes.

We present a number of specifications of our models to establish the robust nature of our findings as well as to reveal different layers of explanation. For example, we start by estimating the effect of the four categories of psychosocial influences (support, teaching, workload and motivation) upon aggregate engagement. We then repeat this estimation for each of the three the components of engagement (time and effort, interaction and participation). We drill down to a further level of disaggregation by using the individual questions forming our psychosocial influence components.

## RESULTS

Variable descriptions as well as summary statistics for all measures are provided in Table 1. First year students report a statistically significant higher level of employing both in-class active teaching strategies and out-of-class support tools. They dedicate more time to their university workload, as well as report higher levels of engagement with respect to participation (frequency of lecture and tutorial participation and contribution to tutorial and online forum discussion). However, this does not necessarily translate into greater interaction with fellow classmates or the lecturer. With respect to student outcomes, seniors outperformed their first year counterparts on test grades. In contrast, first year students report greater levels of gains to personal and professional skills (such as critical and analytical thinking).

### STUDENT ENGAGEMENT AND PSYCHOSOCIAL INFLUENCES

We now look more closely at the nature of the relationship between psychosocial antecedents and student engagement using equation 1 of our simultaneous equation system in Table 2. The first two columns of results are for the aggregate engagement category, being the sum of *time and effort*, *interaction* and *participation* components. These three disaggregated engagement components are then reported in the remaining columns. Starting with the aggregated results, we establish strong links between active teaching strategies as well as student motivation, with student engagement for both first year and senior students. As well, we find a positive relationship between student workload and engagement for first year students only. In contrast, out-of-class support tools had no influence on engagement.

Analysing each component of engagement separately reveals an interesting story. Active teaching strategies exert a positive influence on all students' time and effort, participation, and interaction. The main difference observed in these results is that active teaching strategies play a stronger role in

encouraging interaction for first year students where this is a weaker effect for senior students. We also observe other relationships that are unique to first year students only. For example, out-of-class support tools play a role in increasing first year students' participation but not so for seniors.

To understand the individual influences better, particularly active teaching strategies associated with students' engagement, we disaggregated the psychosocial influences by their individual survey questions and re-estimated equation 1. Our results presented in Tables 3 and 4 show a modest improvement in explanatory power as captured by the coefficient of determination (R square), however, few statistically significant individual slope coefficients are evident. This is particularly surprising for the individual questions within the in-class active teaching activities. However, closer inspection of the relationship between individual questions reveals a high level of correlation between individual questions within each of the four psychosocial influence categories. Due to the complexity of the multicollinearity and lack of clarity in how to solve this problem, it was decided not to pursue this analysis at this fine level of disaggregation.

### **STUDENT ENGAGEMENT AND PROXIMAL CONSEQUENCES**

The estimation results of the influence of engagement upon measure of student outcome (proximal consequences) are presented in Tables 5 and 6. This represents our estimation of equation 2. The two-stage least squares method uses the predicted value of engagement from equation 1, as derived from Table 2 estimation results, as the explanatory variable in order to avoid simultaneous equation bias. We start with the aggregate measure of student outcomes as our dependent variable in Table 5. Consistent with the presentation in Table 2, we first use aggregate engagement as our explanatory variable followed by alternative specifications capturing each component of engagement separately. Regardless of our measure, we observe a strong relationship between engagement and student outcome. However, in all models the engagement slope coefficient for senior students exceeds that of the corresponding first year student estimate, implying that the return on engagement for first year students is relatively lower.

We now disaggregate our student outcome dependent variable into two components: exam result and self-reported gains in professional and personal skills. We found no significant relationship between student engagement and academic achievement in our estimation results presented in Table 6. While somewhat surprising, it has also been observed in other similar studies such as Carini, Kuh, and Klein (2006). In contrast, student engagement is strongly associated with gains in professional and personal skills.

Overall, as Tinto (2014) claims, engagement does matter and it should be seen as a key to student achievement (Krause & Coates, 2008). It is, however, a complex concept with multiple theories which differ in emphasis on different learning elements (e.g., Hu & Kuh, 2002; Kahu, 2013; Engstrom & Tinto, 2008). Although our framework is not as comprehensive as that suggested by Kahu (2013), our results emphasize that engagement is a variable influenced by various student and institutional factors. In line with Kahu (2013), our findings also acknowledge that students obtain knowledge and skills needed for future success through being engaged with their study.

**Table 1.** Summary Statistics

Measure	Description	Metric	All Students (N=220)		First Year Students (N=119)		Seniors (N=101)	
			Mean	SD	Mean	SD	Mean	SD
<b><u>Psychosocial Influences</u></b>								
<b>Support</b>	Degree satisfied with the teaching support services and materials	Sum of 4 items	11.89	7.28	12.65	7.68	10.99***	6.70
<b>University workload</b>	Amount of hours spent for preparation of the subject-related assessment, tutorials, lectures, and studying other subjects	Sum of 5 items	11.53	2.90	11.81	3.15	11.20***	2.57
<b>Student motivation</b>	Degree of student motivation in learning the subject better	Sum of 4 items	11.53	2.93	11.52	2.79	11.54	3.12
<b>Teaching</b>	Self-reported engagement improvement level caused by active teaching techniques	Sum of 6 items	21.69	6.53	22.40	6.50	20.93***	6.50
<b>Total</b>		Sum of above 24 items	74.54	17.09	76.55	17.82	72.37***	15.97
<b><u>Engagement</u></b>								
<b>Time and effort</b>	Degree of participation in peer-assisted study sessions, online practicing and reviewing recorded lectures	Sum of 5 items	17.7	3.34	17.83	3.12	17.54	3.59
<b>Interaction</b>	Degree of student interaction with classmates and instructors	Sum of 7 items	18.01	6.79	18.40	6.40	17.55	7.19
<b>Participation</b>	Frequency of lectures and tutorials participation and contribution to tutorial and online forum discussions	Sum of 4 items	14.30	2.94	14.58	3.01	13.92***	2.85
<b>Total</b>		Sum of above 16 items	50.02	10.61	50.85	10.06	49.02	11.11
<b><u>Proximal Consequences</u></b>								
<b>Academic achievement</b>	Student academic test grade	Grade average	3.39	1.49	3.21	1.44	3.62**	1.54
<b>Self-reported outcome</b>	Self-reported gains in personal and professional skills including thinking critically and analytically	Sum of 5 items	17.47	4.52	18.14	4.02	16.72**	4.96
<b>Total</b>		Sum of above 6 items	20.86	5.02	21.35	4.39	20.33	5.67

**Notes:** \*\*\* and \*\* are indicative of statistical difference between first year and senior's population means at the 1% and 5% levels of significance assuming unequal population variances. Also see Appendix tables for individual questions of each category.

**Table 2.** Psychosocial Influences' Effect on Aggregate Engagement and Disaggregated Engagement Components

Psychosocial Influences	Aggregate Engagement		Time and Effort		Interaction		Participation	
	First Year	Seniors	First Year	Seniors	First Year	Seniors	First Year	Seniors
<b>Constant</b>	14.6304	16.83791	7.723665	7.129569	0.849609	1.65655	6.057128	8.051795
<b>Support</b>	0.062215	0.151171	0.033036	0.061546	-0.046514	0.047453	0.075693**	0.042172
<b>Teaching</b>	0.518678***	0.494353***	0.135361***	0.186094***	0.305399***	0.189781*	0.077919**	0.118478***
<b>Workload</b>	0.422129*	0.06603	0.267647***	0.098001	0.021631	-0.044361	0.132851***	0.01239
<b>Student motivation</b>	1.633105***	1.67815***	0.293313***	0.468637***	0.971565***	0.95598**	0.368226	0.253533**
<b>Gender</b>	-0.735258	-0.620439	0.007095	-1.249611	-0.98949	1.116439	0.247136	-0.487266
<b>Non-Australian</b>	4.033327	3.133218	0.289273	-0.955031	3.440007*	4.249743*	0.304048	-0.161494
<b>Part-time Student</b>	3.113417	-2.538314	3.765587**	-0.3259	1.334156	-1.329612	-1.986326	-0.882802
<b>Non-English-Speaking Background</b>	-1.793392	1.146227	-0.11145	0.955377	-1.027507	-1.149446	-0.654435	1.340296
<b>Standard error of regression</b>	7.191	8.449	2.511	2.792	5.248	6.142	2.459	2.524
<b>R Squared</b>	0.528	0.474	0.399	0.446	0.379	0.335	0.374	0.288

Notes: \*\*\*, \*\* and \* are indicative of significance levels at 1%, 5% and 10%, respectively.

**Table 3.** Disaggregated (Individual Questions) Psychosocial Influences' Effect on Aggregate Engagement

Psychosocial Influences	Aggregate Engagement	
	First Year	Seniors
Constant	19.2013	25.96752
<u>Support</u>		
How useful did you find the PASS program	1.271145	-1.796427
Did you find MML useful to prepare for this subject	-1.9752**	0.784364
Did MML help you to understand the subject content better	1.300531	-0.571745
Did you gain a better understanding through participation at PASS	-1.164856	1.952275
<u>Teaching</u>		
To what extent did "MML" let you feel more engaged with this subject	1.232536*	0.774343
To what extent did "uploaded slides" let you feel more engaged with this subject	-0.142624	1.390115*
To what extent did "practical examples" let you feel more engaged with this subject	1.073939	0.461043
To what extent did "the cartoons" let you feel more engaged with this subject	0.495976	-0.306664
To what extent did "funny videos" let you feel more engaged with this subject	0.722686	1.344067
To what extent did "applied activities" let you feel more engaged with this subject	-0.319773	-0.990792
<u>Workload</u>		
How many hours a week did you spend on Preparation for the midterm exam	1.244054	-0.826433
How many hours a week did you spend on Preparation for each lecture	2.289979	2.890478
How many hours a week did you spend on Preparation for each tutorial	1.090131	-1.084431
How many hours a week did you spend on Preparation for online quizzes	-0.246824	0.320418
How many hours a week did you spend on studying during a typical 7-day-week	-0.061317	-0.365978
<u>Student Motivation</u>		
Did you feel enthusiastic when studying for this subject	2.099153***	2.816514***
Did you summarize major points and information in your readings or notes	1.302661*	1.871303**
Did you tutor or teach other students	2.515032***	2.026957**
Did you come to class with completing readings	-0.067366	-1.269033
<u>Gender</u>		
Non-Australian	1.273808	2.956019
Part-time Student	-0.678342	-1.721556
Non-English-Speaking Background	-1.26567	-3.310187
Standard error of regression	6.981	7.705
R Squared	0.616	0.634

Notes: \*\*\*, \*\* and \* are indicative of significance levels at 1%, 5% and 10%, respectively.

**Table 4.** Disaggregated (Individual Questions) Psychosocial Influences' Effect on Disaggregated Engagement Components

Psychosocial Influences	Time and Effort		Interaction		Participation	
	First Year	Seniors	First year	Seniors	First year	Seniors
Constant	8.038584	8.291176	5.578967	5.901832	5.583748	11.77451
<b>Support</b>						
How useful did you find the PASS program	0.281957	-0.706772	0.269648	-0.433957	0.71954	-0.655697
Did you find MML useful to prepare for this subject	-0.323241	0.332465	-1.675897	0.888229	0.023938	-0.436331
Did MML help you to understand the subject content better	0.456735	0.083861	0.921542	-1.182446	-0.077746	0.52684
Did you gain a better understanding through participation at PASS?	-0.328993	0.74093	-0.351847	0.518395	-0.484016	0.69295
<b>Teaching</b>						
To what extent did "MML" let you feel more engaged with this subject	0.177232	0.089776	0.795786*	0.482748	0.259518	0.201819
To what extent did "uploaded slides" let you feel more engaged with this subject	0.072266	0.427737	-0.195845	0.578071	-0.019045	0.384307
To what extent did "Practical examples" let you feel more engaged with this subject	0.475553*	0.478444	0.43143	0.097543	0.166956	-0.114944
To what extent did "the cartoons" let you feel more engaged with this subject	0.404229	-0.32704	0.548349	0.030909	-0.456601	-0.010533
To what extent did "funny videos" let you feel more engaged with this subject	-0.394997	0.31518	0.587974	0.836107	0.529709	0.192779
To what extent did "applied activities" let you feel more engaged with this subject	0.093166**	-0.337376	-0.368693*	-0.509925	-0.044246	-0.143491
<b>Workload</b>						
How many hours a week did you spend on Preparation for the midterm exam	0.271815	0.414948	1.125592	-1.254509	-0.153352	0.013128
How many hours a week did you spend on Preparation for each lecture	1.24145	0.787568	1.683739	1.327597	-0.63521	0.775312

<b>How many hours a week did you spend on Preparation for each tutorial</b>	-0.307477	-0.452573	0.313992	-0.293395	1.083617	-0.338463
<b>How many hours a week did you spend on Preparation for online quizzes</b>	0.267031	0.0385	-0.953506	1.12595	0.439652	-0.844033
<b>How many hours a week did you spend on studying during a typical 7-day-week</b>	0.297737	-0.198376	-0.467315	-0.245472	0.10826	0.07787
<b>Student Motivation</b>						
<b>Did you feel enthusiastic when studying for this subject</b>	0.259567	0.688818	1.579578***	1.605619***	0.260008	0.522077*
<b>Did you summarize major points and information in your readings or notes</b>	0.359554	0.980182	0.077658	0.655584	0.865449***	0.235537
<b>Did you tutor or teach other students</b>	0.073504	-0.291471	2.130869***	2.012641***	0.310659	0.305787
<b>Did you come to class with completing readings</b>	0.021189	0.156439	-0.22376	-1.115241*	0.135205	-0.310231
<b>Gender</b>	0.133295	-0.964951	-1.558466	1.166959	0.208106	-0.444484
<b>Non-Australian</b>	0.188461	-0.580246	0.596644	3.661572	0.488702	-0.125307
<b>Part-time Student</b>	2.882784	-0.613917	-1.642983	-0.428046	-1.918143	-0.679593
<b>Non-English Speaking Background</b>	0.118405	0.961561	-0.554834	-4.359274	-0.82924	0.087526
<b>Standard error of regression</b>	2.503	2.621	4.726	5.460	2.475	2.440
<b>R Squared</b>	0.485	0.592	0.565	0.560	0.452	0.443

Notes: \*\*\*, \*\* and \* are indicative of significance levels at 1%, 5% and 10%, respectively.

**Table 5.** Aggregate and Disaggregate Engagement's Effect on Proximal Consequences

	First Year	Seniors	First Year	Seniors	First Year	Seniors	First Year	Seniors
<b>Constant</b>	3.904999	-2.308875	-1.466085	-5.875243	10.0903	5.385903	-0.482302	-14.67373
<b>Aggregate Engagement</b>	0.329006 ***	0.449274 ***						
<b>Time and Effort</b>			1.238898 ***	1.396191 ***				
<b>Interaction</b>					0.57628 ***	0.863521 **		
<b>Participation</b>							1.437766 ***	2.432866* **
<b>Gender</b>	0.957837	0.943105	1.010212	2.562167	1.035716	-0.431405	0.585466	1.926422
<b>Non-Australian</b>	-1.071323	-0.942973	0.201527	1.797223	-1.804763	-3.127777	-0.28834	0.981693
<b>Part-time Student</b>	0.527442	2.186541	-3.981944	1.637868	0.971113	2.104238	4.13839	3.444782
<b>Non-English-Speaking Background</b>	1.257664	0.008352	0.45403	-0.627233	1.350537	1.33139	1.789011	-2.441941
<b>Standard error of regression</b>	4.263	5.749	4.964	5.573	4.673	7.123	4.852	7.042
<b>R Squared</b>	0.104	0.015	0.2151	0.0742	0.077	0.513	0.161	0.478

Notes: \*\*\* and \*\* are indicative of significance levels at 1% and 5%, respectively.

**Table 6.** Engagement's Effect on Disaggregated Proximal Consequence Components

	Exam Result		Self-reported Outcomes	
	First Year	Seniors	First Year	Seniors
<b>Constant</b>	2.328168**	1.623065	1.576831	-3.931940
<b>Engagement</b>	0.007661	0.038509	0.321345***	0.410765***
<b>Gender</b>	0.417707	0.079517	0.540130	0.863588
<b>Non-Australian</b>	1.088183**	0.351805	-2.159505	-1.294778
<b>Part-time Student</b>	1.518639*	0.249541	-0.991197	1.937000
<b>Non-English-Speaking Background</b>	-0.094436	-0.081794	1.352099	0.090146
<b>Standard error of regression</b>	7.191	8.449	7.191	8.449
<b>R Squared</b>	0.528	0.474	0.528	0.474

Notes: \*\*\*, \*\* and \* are indicative of significance levels at 1%, 5% and 10%, respectively.



## DISCUSSION

COMM121 was the earliest first year Business subject at our university that employed an online practice and assessment system and its students had no previous experience of using this online platform in either COMM121 or any other first year Business subject. Therefore, our sample collected in the first year of this online system which was introduced to Business students, provides a unique insight into students' engagement with both face-to-face and online activities. The study adds to the rich stream of research into students' engagement in a tertiary education setting, with a particular focus on a comparison between the experiences of first year and senior students. Such investigation is motivated by the increasing diversity of university entrants and the desire to enhance the retention rate of such students. We provided an empirical analysis of Kahu's (2013) conceptual framework of student engagement by examining the links between engagement and its hypothesized antecedents and consequences. Using a case study of over two hundred students in a core business subject, we found strong evidence to support the main aspects of Kahu's framework, namely, the effect of various psychosocial influences, with a particular focus on active teaching strategies, on student engagement, and subsequently, the role of engagement upon student outcomes. However, we also established a number of differences in the operation of this framework for first year versus more senior students.

Our initial descriptive statistics analysis revealed that first year students made greater use of both in-class active teaching strategies as well as out-of-class support tools. They also displayed greater student engagement, as measured by our participation measures. Using our simultaneous equation modelling, we established a strong positive link between in-class active teaching strategies and engagement for both first year students and seniors. However, we also established unique links between active teaching strategies and engagement for first year students that were not evident for senior students. First, the in-class active teaching strategies had a stronger impact on increasing first year students' interaction compared to senior students. Second, the uses of out-of-class support tools were generally less effective in encouraging student than in-class activities. However, we were able to establish that out-of-class support tools did play a role in increasing first year students' participation, but not that of senior students. These results are in line with the view of Reynolds and Nunn (1998), who contend that first year students can be more sensitive to "signals" from instructors and to the general classroom environment during their first year, which is a period of adaptation and change.

We also established a strong connection between engagement and student outcomes for both first year and senior students. However, further disaggregated analysis revealed that this effect was dominated by the influence of student engagement upon development of personal and professional skills rather than academic achievement in terms of exam results. We also found that the increase in skills development from student engagement was smaller for first year students compared to seniors.

First year students display a greater propensity to be involved with both in-class active teaching activities and out-of-class support tools and activities. We have established a more comprehensive link between various active teaching strategies and engagement for first year students' engagement compared to that of senior students, as measured by participation and interaction. However, while it appears that it is relatively easier to encourage first year students to engage in these active teaching activities, there is a weaker link between their engagement and the development of their personal and professional skills compared to senior students. Our findings support previous literature that although active teaching strategies increase students' engagement, careful design and delivery is required to enhance students' cognitive and emotional engagement.

## CONCLUSION

This study has demonstrated both the relevance and usefulness of Kahu's conceptual framework in an empirical application. We have been able to quantify the level of engagement of first year students and senior students. We determined there are multiple factors such as participation, motivation, roles of institutional structures, what content is presented and how lectures are delivered that all influence the extent to which students engage. In spite of the prevalence of technology-enhanced learning being used in various ways for two decades in our university, this paper reveals the differences between first and senior students acquiring not only knowledge, but the skills of critical and analytical skills as well. We argue that well-designed active in-class activities promote motivation and participation, especially in first year students and we reiterate the importance of curriculum design (TEQSA, 2020) and the early identification of students at risk and how to support them.

## FURTHER RESEARCH AND LIMITATIONS

While this research provided an assessment of a blended face-to-face and online teaching experience, future research can further investigate student engagement, motivation and performance in a purely online environment which is currently occurring during COVID-19 lockdowns as well. For instance, in the case of the first year Statistics subject considered in this study, in addition to the previously provided support, students were offered further online support, such as online consultations, live online lectures, online tutorials, free access to the e-text, and quick access to assessments' feedback (as they were marked online) when the subject was offered online in Spring 2020. Hence, 2020 data can be beneficial in understanding first year students' engagement when all subjects were delivered online. In such an environment, the online practice platforms may emerge as being more attractive to students compared to online practice papers or tests provided by instructors. Similarly, further research using longitudinal analysis in different settings, and courses may be able to add another layer to our understanding on how active online teaching strategies could enhance students' engagement and learning. Additionally, other aspects suggested by Kahu (2013), such as longitudinal observations could be considered in future studies to better understand structural influences (e.g., university policies, assessments, curriculum or distal consequences). Work-integrated learning, work success and life-long learning are also other factors that can be included in future studies if the data is available.

We are aware that we cannot overcome some methodological limitations of statistical analysis, sample size and the cross-sectional nature of our observations. Finally, we do not know yet if our findings are restricted to the core statistics subject analysed here or have a more general application across other disciplines.

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## APPENDICES

**Table A.1** Survey Items Contributing to Psychosocial Influences

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I.	<p><b>University Support</b> (Usefulness of teaching support services and materials, out of 5)</p> <p>S1. How useful did you find the PASS (Peer-Assisted Study Sessions) program</p> <p>S2. This subject provides access to MML. Did you find this software useful to prepare for this subject?</p> <p>S3. Did MML help you to understand the subject content better?</p> <p>S4. Did you gain a better understanding through participation at PASS?</p>
II.	<p><b>University Workload</b> (Amount of hours spent for preparation of the subject-related assessment, tutorials, lectures, and studying other subjects)</p> <ul style="list-style-type: none"> <li>▪ How many <u>hours a week</u> did you spend on each of the following (1 for 0 hour, 2 for 1-5 hours, 3 for 6-10 hours, 4 for 11-20 hours, and 5 for 21-30 hours, 6 for 31-35 hours, 7 for more than 35 hours):</li> </ul> <p>W1. preparation for the midterm exam</p> <p>W2. preparation for each lecture</p> <p>W3. preparation for each tutorial</p> <p>W4. preparation for each online quiz for which you receive marks</p> <p>W5. Total time for studying during a typical 7-day week</p>
III.	<p><b>Student Motivation</b> (Degree of student motivation in learning the subject better, out of 5)</p> <p>M1. Feel enthusiastic when studying for this subject –engagement – interest</p> <p>M2. Summarize major points and information in your readings or notes.</p> <p>M3. Tutor or teach other students.</p> <p>M4. Come to class with completing readings</p>
IV.	<p><b>Teaching</b> (Self-reported interest improvement level caused by active teaching techniques, out of 5)</p> <ul style="list-style-type: none"> <li>▪ To what extent did this feature let you feel more <u>engaged</u> with this subject:</li> </ul> <p>T1. MML</p> <p>T2. Slides being uploaded at least one week before lecture</p> <p>T3. Practical examples</p> <p>T4. Cartoons</p> <p>T5. Funny videos</p> <p>T6. Applied activities at the end of each learning unit</p>

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**Table A.2** Survey Items Contributing to Student Engagement

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I.	<b>Time and effort</b> (Degree of participation in peer-assisted study sessions, online practicing and reviewing recorded lectures, out of 5)
	<ol style="list-style-type: none"> <li>1. Use online practicing (e.g. MML)</li> <li>2. Use ECHO (recorded lectures)</li> <li>3. How many hours a week did you spend on preparation for PASS</li> <li>4. Work harder than you thought you could to meet an instructor's standards or expectations</li> <li>5. Prepare a copy of lecture notes before attending the lectures</li> </ol>
II.	<b>Interaction</b> (Degree of student interaction with classmates and instructors, out of 5)
	<ol style="list-style-type: none"> <li>1. Work with classmates outside of class-on-class projects, tutorial questions or assignments</li> <li>2. Use an electronic tool (e-mail, class website, etc.) to communicate with another student about coursework</li> <li>3. Use an electronic tool (e-mail, class website, etc.) to communicate with an instructor about coursework</li> <li>4. Discuss a tutorial question or grade with an instructor</li> <li>5. Discuss ideas from your readings or classes with instructors outside of class (during consultation)</li> <li>6. Discuss ideas from your readings or classes with others outside of class (students, family, co-workers, etc.)</li> <li>7. Have serious conversations about this subject with students of a different race or ethnicity from your own</li> </ol>
III.	<b>Participation</b> (Frequency of lectures and tutorials participation and contribution to tutorial and online forum discussions, out of 5)
	<ol style="list-style-type: none"> <li>1. Attend lectures</li> <li>2. Attend weekly tutorials</li> <li>3. Use online forum</li> <li>4. Ask questions in tutorials or contribute to tutorial discussions</li> </ol>

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**Table A.3** Survey Items Contributing to Proximal Consequences

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I.	<b>Achievement</b> (student academic test grade, out of 5)
	<ul style="list-style-type: none"> <li>▪ What grade did you get from the COMM121 mid-term exam? (1 for F, 2 for P, 3 for C, 4 for D, and 5 for HD)</li> </ul>
II.	<b>Self-reported outcome</b> (Self-reported gains in personal and professional skills including thinking critically and analytically, out of 5)
	<ul style="list-style-type: none"> <li>▪ Overall, within a class: <ol style="list-style-type: none"> <li>a) I learned to improve my study skills (listening, note-taking, highlighting readings, working with others, etc.)</li> <li>b) I learned skills and strategies to improve my test-taking ability</li> <li>c) I learned to think critically and analytically</li> <li>d) I learned to learn effectively on my own</li> <li>e) I learned to analyse quantitative problems</li> </ol> </li> </ul>

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