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Decision comfort and student engagement in higher education

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ABSTRACT

In today's dynamic service environment, the higher education sector has maintained steady growth. The incorporation of technology in the process of teaching engages the students in the classroom, however, the students tend to indicate lower levels of engagement. Although engagement in the classroom is pivotal for student success, a robust understanding of the means to enhance student engagement is quite scarce. Thus, this study examines a robust research framework to have a better understanding of student engagement. Derived from the survey of university students, the proposed research hypotheses were tested. Results show that co-production behaviour and decision comfort are prominent drivers of student engagement. Results also show that decision comfort mediates the path between students' goal intention and student engagement. Finally, we discuss the managerial and theoretical implications.

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Student engagement; co-production behaviour; decision comfort; goal intention

1. Introduction

Customer engagement has been a topic of great importance for academics and practitioners in recent years (Alvarez-Milán et al., 2018; Behnam et al., 2021; Hollebeek, 2013; Japutra et al., 2022; Utami et al., 2022). Customer engagement is positively correlated with sustainable competitive advantage (Hollebeek et al., 2019a; Pansari & Kumar, 2017). Furthermore, studying the engagement of different actors in a system is critical to comprehend the interactive dynamics of engagement (Sim et al., 2018). This enables service firms to manage their resources effectively to create higher levels of engagement.

Higher levels of engagement are equally important in higher education institutions where active student management is needed regularly (Conduit et al., 2016). This stream of literature argues provided with the nature of the education section that is demand-driven, higher education institutions (HEIs) need to promptly govern student engagement to improve student's learning outcomes. Furthermore, student engagement

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is treated to be a crucial signal of education value (Gunn, 2018; Heilporn et al., 2021), knowledge co-creation and education quality improvement (Smørvik & Vespestad, 2020; Tarı Kasnakoğlu & Mercan, 2022).

Although student engagement has been recognised as one of the pillars of co-production behaviour (Hollebeek et al., 2019b); a broader perspective of student engagement remains debatable (Bokhove & Muijs, 2019; Heflin et al., 2017; Hollebeek et al., 2019b; Vivek et al., 2014). There is a growing belief that future economic growth will depend on inputs from the 'knowledge society' (Smith, 2002) by shifting towards a 'knowledge-based' economy. To ensure such a shift, communication effectiveness during the co-creation process plays an important role (Lusch et al., 2010), especially in the knowledge-intensive higher education sector (Lusch et al., 2010; Ranjan & Read, 2016). This study will add value to this nascent but important stream of literature by providing a much-needed robust understanding of student engagement. Although research focusing on the cognitive factors of student engagement is common (Braxton, 2006; Kuh et al., 2007), literature exploring the impact of a combination of affective and cognitive factors on student engagement remains scarce. This study contributes to the student engagement literature by addressing this research gap. Thus, the objective of this paper is to identify both the affective and cognitive components of student engagement.

This study utilises the economically important higher education sector in Australia as the research context. Higher education is the fourth largest export market in Australia and has A $40.3 billion a year and supported 250,000 jobs. Despite this, there is stiff competition among universities to attract, retain and engage international students (Yezdani, 2021). Thus, this paper contributes to the body of knowledge by examining student engagement from a multidimensional perspective. Specifically, the use of the theory of planned behaviour (TPB) as an overarching theory to examine student engagement provides a more robust approach, encompassing all three dimensions (i.e. psychological, socio-cultural, and behavioural). The positive impact of decision-comfort student engagement is a welcome addition to the literature (Parker et al., 2016). Further, the post-hoc mediation analysis also confirms decision comfort and co-production behaviour as mediators between student goal intention and engagement levels. This additional perspective adds to the importance of co-production behaviour and decision comfort as antecedents of student engagement. Overall, the results strengthened the nomological network of decision comfort by identifying goal intention as a possible antecedent of decision comfort. Thus, it can be argued that ensuring higher levels of student decision comfort can be extremely beneficial for Higher Educational Institutions (HEIs) if handled properly and can provide enough practical reasons to cultivate students' decision comfort levels.

Following the introduction, section 2 presents a summary of the pertinent literature. Continuing, section 3 outlines the construction of our research framework and the proposed hypotheses, whereas section 4 presents an overview of the research methodology. Finally, sections 5 and section 6 discuss and conclude the data analyses and the findings.

2. Review of literature

2.1. Higher Educational Institutions (HEIs)

HEIs need to provide some intangible facets beyond their regular knowledge delivery process as add-ons to enhance subjective student satisfaction levels. The most effective

of such add-ons is student engagement in knowledge co-creation (Altschwager et al., 2018; Uncles, 2018); especially in the complex knowledge-creation process (Narayanan et al., 2009). In such complex scenarios, co-production behaviour causes students to overlook any shortcomings in the quality of the services received (due to self-efficacy and self-attribution biases) (Mathew & Chen, 2013).

For any complex service creation process, service providers should provide service that meets customers' expectations (Narayanan et al., 2009). This is possible only when there is an active engagement from students in the service creation process 'on the go' (if necessary). This active engagement in the service creation process makes the customers more satisfied and comfortable (Forlizzi & Ford, 2000. This perceived comfort level of the customer is known as 'decision comfort' (Parker et al., 2016). Thus, decision comfort can be viewed as an ideal affective component of student engagement and student satisfaction.

In the context of HEI, co-production behaviour and decision comfort represent the cognitive and the affective sides of student engagement respectively. These two perspectives provide a robust view of student engagement (Kang & Van Ryzin, 2021).

The success of a student, depends, among other factors, on their desire to engage in knowledge-creation activities (Kuh et al., 2007). On a similar note, following Astin's (1997) theory of involvement and persistence, Braxton et al. (2004) and Hughes and Pace (2003) argue that the level of student integration is directly linked with a student's engagement in learning and knowledge co-creation activities. However, the extent to which (and how) student engagement can influence success above and beyond a student's academic abilities remains ambiguous. Milem and Berger (1997) argue that a student's level of social integration with her learning community depends on her engagement through actual (i.e. cognitive) and emotional (i.e. affective) factors.

2.2. Student engagement

Skinner and Belmont (1993) and Richardson and Newby (2006) define student engagement as the emotional quality of a student's involvement and its intensity in initiating and carrying out learning activities. However, we go beyond this perspective and propose a broader perspective of student engagement (Brown et al., 2022; Heilporn et al., 2021).

Student engagement incorporates their expectations, perceptions and their experience of being a student (Bryson et al., 2009; Rather, 2020). Researchers who follow this approach, argue that the HEIs should focus on the notion of producing students who graduate possessing more than simply a degree (Bryson & Hand, 2007). Researchers from this school of thought conceptualise engagement as a dynamic construct within different locations (e.g. task, classroom, course materials, institution). A key contribution of this school of thought is recognising the importance of emotion, such as finding the critical importance of the warmth and respect shown by a teacher towards the students to nurture a student's sense of belonging (Bryson & Hand, 2007; Kember et al., 2001).

Another group of researchers, such as Bryson and Hand (2007) suggest that the HEIs should emphasise three aspects of student engagement, namely: (a) active interaction with the students; (b) a teacher's enthusiasm for her subject; and (c) a teacher's level of professionalism.

We bring together these two schools of thought to provide a robust student engagement framework. We conceptualise student engagement as a multidimensional construct consisting of cognitive, behavioural, and emotional components (Fredricks et al., 2004; Rather et al., 2019; Rather & Sharma, 2019; Salas-Pilco et al., 2022). The behavioural component of student engagement incorporates students' active involvement in both academic and extracurricular activities. The emotional component of student engagement develops an emotional bond with her teachers, classmates, academics and school. Developing a bond with an HEI eventually creates a willingness to work. Finally, the cognitive component of student engagement is a mental state in which students are willing to engage in long study hours regularly (Rotgans & Schmidt, 2011; Salas-Pilco et al., 2022).

Following previous studies, engagement could be defined into three different sub-types: (a) attention, (b) enthusiasm and (c) social interaction (Vivek, 2009). Attention refers to the extent of vigilance, focal point and connection that a person has towards the object of engagement (So et al., 2014). Attention also covers the cognitive aspect of engagement and is referred to it as 'conscious participation (Vivek, 2009). From a student engagement perspective, conscious participation can be interpreted as one's willingness to be an active player in the co-learning process (Naheen & Elsharnouby, 2021). Enthusiasm is a cognitive engagement type (Harrigan et al., 2017) and is defined as 'an individual's strong level of excitement and interest regarding the focus of engagement' (So et al., 2014, p. 308). In the context of student engagement, enthusiasm can be viewed as the level of curiosity and interest one must engage in a co-learning process (Gaspard & Lauermann, 2021). Finally, social interaction encompasses interaction among people who assign analogous concerns towards the engagement object (Vivek, 2009; Wiertz & de Ruyter, 2007). It conveys that extremely engaged students pursue opportunities to associate with other people who carry comparable expertise. Thus, social interaction forms the affective component of student engagement, which increases the student's confidence and comfort levels to engage in learning activities successfully (Kordrostami & Seitz, 2021). Thus, a higher level of student engagement is likely to be related to a higher level of decision comfort.

2.3. Decision comfort

Students not only expect benefits but also expect reduced risk associated with their engagement decision (Holley & Oliver, 2010; Olivier et al., 2020). For example, many HEIs highlight the importance of student comfort while engaging in a learning process. Decision comfort refers to the extent to which individuals feel content concerning a decision and is a significant element of decision-making (Parker et al., 2016). A student's decision may get impacted by her anticipated satisfaction, anticipated regret, affective responses, and decision confidence (Kahu & Nelson, 2018). All these elements reflect the cognitive judgment of the benefits and drawbacks of a choice (Hilken et al., 2017). In contrast, decision comfort is an affect-based sense of ease pertinent to the means of reaching a decision. Hence, this study argues that decision comfort will influence the affective component of student engagement.

We follow the approach of Bryson and Hand (2007, 2008) in conceptualising student success as an outcome of student engagement. These authors visualise student engagement through the lens of co-production behaviour where the HEIs, the teachers and the students come together to create value that is beneficial for all concerned parties.

2.4. Co-production behaviour

Co-production is defined as customers' active participation in the development, production, and delivery of a service (Auh et al., 2007). In the case of HEIs students must be willing to engage in knowledge co-creation and knowledge development without any coercion (Rather, 2021b). This is homogeneous with the organisational citizenship behaviour (hereafter, OCB) aspect which states that: 'individual behaviour … .is rather a matter of personal choice, such that its omission is not generally understood as punishable (Organ, 1988, p. 4).'

In this study, different student co-production behaviours are mapped based on three distinct forms of OCBs outlined by Podsakoff et al. (2000) and Guo et al. (2013). These are civic virtue, compliance, and individual initiative. In HEI, compliance encapsulates the students' agreement and internalisation of willingly adhering to the HEIs' appeals, procedures, or policies (Podsakoff et al., 2000). Contrary to compliance, where the behaviours are stimulated by the institution, a person's action consolidates an ideology that a student will put in additional effort and accept additional responsibilities to go beyond what is required of her (Podsakoff et al., 2000).

Finally, civic virtue serves as the students' macro-level attraction or commitment to the university. Civic virtue can be seen as a student's inclination to contribute to governance and to scrutinise and partake in pathways for the finest interests of the university despite private sacrifice (Podsakoff et al., 2000). This behaviour demonstrates students' resolute to be a component of the greater breadth of university affairs like what a good citizen of any country does.

3. Research model

The theory of planned behaviour (TPB) (Ajzen, 1991) is often accused of giving too much importance to information processing and rational decision-making while neglecting cognitive and affective factors that can also influence the decision-making mechanism. To overcome this critique of TPB, we integrate it with social cognitive theory (Bandura, 1986) which focuses on the concept of social efficacy.[1] TPB is often misinterpreted as representing an individual as an unbiased, rational behavioural decision-maker. Therefore, by integrating social cognitive theory with TPB, our proposed model (Figure 1) provides an understanding of student engagement by capturing both the cognitive and affective aspects.

We argue that students' behaviour can be anticipated from their intentions and in turn, these intentions can be anticipated from students' attitudes towards their behaviour, subjective norm and their perceived behavioural control regarding those. In the following sections, we focus on each of these above-mentioned aspects of student behaviour separately.

3.1. Attitude and goal intention

Attitude is a key element in TPB and is the greatest predictor of intention (Baumann et al., 2007). Attitude encompasses both favourable and unfavourable feelings of an individual towards a behaviour. If a student maintains an attitude that accomplishing goals is a favourable matter for her career, her intention to achieve such goals will be higher.

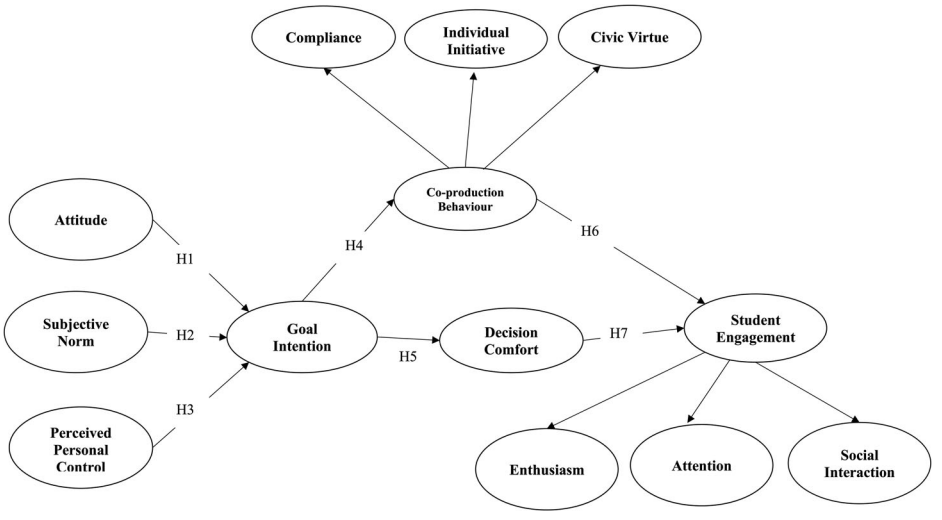

Figure 1. Research framework.

Hence, attitude will be a critical basis to comprehend students' intention to attain goals. Thus, we advance the following hypothesis:

> H1: Students with a more favourable attitude towards achieving goals will exhibit higher intentions to achieve goals.

3.2. Subjective norm and goal intention

Subjective norm has been defined as perceived social pressure to behave in a certain way (Ajzen, 1991; Roos & Hahn, 2017). Subjective norms affect student intention and subsequently her behaviour. Subjective norms affecting a student's intention to achieve certain goals are influenced by her peers, instructors, HEI settings, family influence and others (Wagner et al., 2008). Peers may implicitly (or explicitly) encourage (or discourage) a student's desire to achieve higher goals (Cronan et al., 2018) and her performance level (Fassinger, 1995; Fritschner, 2000; Nunn, 1996). In addition, various aspects of HEI settings, such as classroom situations (Rosenfeld & Jarrard, 1985) and classroom culture also influence a student's goal intention. Finally, parents or other persuasive family members may direct impressions or possess behaviours that may persuade or dissuade students to attain goals. Students are prone to be swayed by the sentiments and behaviour of their social stakeholders. The higher the influence of subjective norms, the higher the student intends to attain goals. Based on these theoretical premises, we proposed the following hypothesis:

> H2: Students with higher subjective norms will exhibit higher intentions to achieve goals.

3.3. Perceived behavioural control and goal intention

Perceived behavioural control refers to the perception of ease among individuals to perform a behaviour (Ajzen & Madden, 1986; Webb & Sheeran, 2006). Essentially, it

manages the affairs associated with the inability to accomplish the said behaviour, even if the person's attitude and subjective norms are assisting the act of operating such a behaviour. Thus, perceived behavioural control acquires other private and external traits that are above an individual's control. A higher degree of perceived behavioural control features greater assistance by HEI in persuading students to attain higher goals. According to Hill (1995), HEI support may include one or more of these services like teaching, administrative support, IT support, library facilities, placement services, career counselling and welfare services among others. Thus, perceived behavioural control will regulate student intention based on the perceived ease of attaining goals (Dixit et al., 2019). Based on the above discussion, we propose the following hypothesis:

H3: Students with greater perceived behavioural control will exhibit higher intentions to achieve goals.

3.4. Goal intention and co-production(co-Creation) behaviour

The intention to achieve success reflects an individual's determination to achieve a particular goal (Bandura, 1986). From a student's perspective, intentions represent her motivation to make a conscious decision to engage in a specific set of behaviours to achieve success (Kahu & Nelson, 2018). Such student engagement can be seen as the co-production of the learning process (Podsakoff et al., 2000) and as the co-creation of values (Bryson, 2016; Rather et al., 2022).

In the case of HEIs, several of the possible goals students develop while appearing to constitute deep learning, a collegial mode of learning, a more confined gap between students and the education system (McCulloch, 2009), enriched learning experience (Rather & Hollebeek, 2021) and improved value perception (Dollinger & Vanderlelie, 2021; Kotze & Du Plessis, 2003; Rather et al., 2018; Rather & Camilleri, 2019). To accomplish these goals, students must have the willingness to engage in co-production behaviour with tutors, peers, and the wider university settings (Molesworth et al., 2009). Therefore, goal intention is likely to regulate co-production behaviour:

H4: Higher student intention levels to achieve goals influence their intentions to participate in co-production behaviour with the HEIs.

3.5. Goal intention and decision comfort

Any individual decision is based on her: a) goal intentions; b) evaluation of information pertinent to the goal; c) relative assessment of the competencies related to the goal; d) exploration of the external environment and e) prediction about the achievement of the goal (Bagozzi, 1992).

Student decision-making also follows the same path. Thus, students will choose goals that are: a) valuable; b) lead to positive outcomes; c) pleasurable to attain and d) feasible. Thus, goals play the role of a source for students to measure their performances. Students following higher goals feel satisfied and establish a feeling of accomplishment due to the reduced perceived discrepancy between their level of decision comfort of achieving their goal and the actual goal outcome. This ramification is logical with the

concept of decision comfort (Parker et al., 2016). Thus, goal intention will prompt decision comfort based on the ease, contentment and well-being a student experiences about their decision to pursue a particular goal. Thus, we propose the following hypothesis:

H5: A greater intention to achieve goals has a positive impact on the students' levels of decision comfort.

3.6. Co-production behaviour and student engagement

Recent research related to student learning activities emphasises developing a schema that helps the students to expand their learning opportunities by creating a co-learning mechanism (Bryson, 2016; Podsakoff et al., 2000). Establishing such mechanisms increases the knowledge co-creation opportunities available to the student through the creation of learning communities (Bransford et al., 2000). In the student engagement context, co-production behaviours engage students in an interactive environment with the HEI that is of shared importance to the HEI and the student (Vivek et al., 2012). Such a mutually beneficial interaction results in increased levels of enthusiasm from both the HEI and the students and subsequently leads to an increase in student engagement levels (Bryson, 2014). Hence, the following hypothesis is proposed:

H6: Students' intention to participate in co-production behaviours with HEIs positively influence their engagement levels.

3.7. Decision comfort and student engagement

Emotion is the foundation of action (Engel et al., 1995; Watson et al., 1988) and is an antecedent to engagement (Pansari & Kumar, 2017). According to Watson et al. (1988), positive emotion is an activated and attentive state of mind. Decision comfort is defined as a positive emotion consisting of a unique, affective response to a specific decision (Parker et al., 2016). Decision comfort, representing a positive emotion, is a possible antecedent of student engagement. Thus, the following hypothesis is proposed:

H7: Students' decision comfort levels positively influence their engagement.

4. Research methods

4.1. Measurement instrument

The measurement items for all the constructs in the research model were adapted from the existing literature and shown in Table 1. Goal intention was measured using three items from Tang et al. (2016); perceived personal control was measured with three items from Fishman (2014); subjective norm and attitude towards university using three items from Brahm and Jenert (2015); items for the three dimensions of co-production behaviours were adapted from Guo et al. (2013); decision comfort from Parker et al. (2016); and the dimensions of student engagement from Grillo and Damacena (2015).

4.2. Sample and data collection

This study was conducted at one of the largest universities in Australia. Australia was chosen for this study as higher education is Australia's fourth largest export sector and its contribution is close to A$40 billion (Yezdani, 2021). We used a convenience sampling approach to collect data from the current students of three post-graduate business programmes at the university. We chose this sampling strategy as the primary objective of this study was to test the associations among variables in the proposed research model, rather than providing interval and point estimates (Calder et al., 1981). In addition, since this study aims at theoretical elucidation and not a generalisation, the use of a convenience sampling approach may suffice (Sternthal et al., 1994). The survey was created on Qualtrics and administered to the students via email. Students received course credits on one of the assessments as a reward for their time in filling out the surveys. Data were collected in 2018–2019. Since all the students chose to get the course credits instead of completing the questionnaires, the response rate stands at 100%. The total usable sample size was 259. Hair et al. (2014) recommend 5–10 completed responses for each variable used in the research model. This study meets this requirement and is also consistent with existing studies in the higher education context (e.g. Maroco et al., 2016)

Following Balaji et al. (2016) we used G*Power 3.1.9.4 to conduct the statistical power analysis, which indicates that a sample size of 259 results in medium effect sizes at 80% statistical levels (Faul et al., 2007).

5. Data analysis and results

5.1. Common method bias

We dealt with common method bias (CMB) by using the statistical procedures proposed by Podsakoff et al. (2003) and Raza et al. (2020). We assured the respondents of anonymity and made sure that they responded freely. Next, in this study, we used existing scales to measure the constructs in our model and enabled the psychological separation between predictor and criterion constructs' measurements. We used a common latent factor related to all measurement items to identify CMB (Hulland et al., 2018). Results indicate that CMB is not a major worry in this study.

5.2. Reliability and validity

In this study, Partial Least Square-Structural Equation Modelling (PLS-SEM) was used to test the proposed hypotheses in the research model. Researchers have regarded PLS-SEM ability to efficiently undertake broad problems (Hair et al., 2011). Through Smart PLS 3.0., the present study tested the conceptual framework using a two-stage approach. In a two-stage approach, the first step is to build and evaluate the outer measurement model and then the inner structural model (Hair et al., 2011; Hair et al., 2014). In this study, we evaluated the outer model to assess the validity and reliability of the measures. The items and loadings for each scale are shown in Table 1.

Reliability was checked by assessing the composite reliability (CR), where reliability is evident if the CR score is greater than 0.60 (Bagozzi & Yi, 1988). In the present study, the CR scores are greater than 0.60, which means the constructs were reliable. After

Table 1. Measurement items and factor loadings.

Constructs and Sources	Items	Factor Loadings
Attitude (Brahm & Jenert, 2015)	AT1: I find it attractive to study at this university	0.93
	AT2: I can identify with this university	0.87
	AT3: I like to be a student of this university	0.93
Subjective Norm (Brahm & Jenert, 2015)	SN1: Most people important to me support that I study at this university	0.9
	SN2: Friends approve that I study at this university	0.9
	SN3: My family approves that I study at this university	0.89
Perceive Personal Control (Fishman, 2014)	PC1: I have a great deal of control over my academic performance in my courses	0.73
	PC2: The more effort I put into my courses, the better I do in them	0.81
	PC3: No matter what I do, I can't seem to do well in my courses	0.76
Goal Intention	GI1: I am planning to achieve the goal (e.g. good grades, successfully complete the course)	0.94
Tang et al. (2016)	GI2: I will make an effort to achieve the goal (e.g. good grades, successfully complete the course)	0.94
	GI3: I intend to achieve the goal (e.g. good grades, successfully complete the course)	0.93
Co-production Behavior (Higher Order) (Guo et al., 2013)	Compliance	0.72
	Individual Initiative	0.93
	Civic Virtue	0.87
Compliance	COM1: I try to do what lecturers/tutors ask me to do	0.84
	COM2: I follow the recommended unit outlines/guidelines	0.85
	COM3: I respond to any inquiries from the university	0.82
Individual Initiative	II1: I put the educational guidance and suggestions to good use in my student life	0.77
	II2:I actively seek advice from the university on educational decisions	0.81
	II3: I consider myself a highly participating student of this university	0.82
	II4: I provide feedback about this university and its programmes	0.77
Civic Virtue	CV1: I communicate with the university about the potential teaching and service related issues	0.91
	CV2: I make suggestions to the university about how to improve its services	0.95
	CV3: I let the university know of ways that can better serve the my needs	0.94
Decision Comfort (Parker et al., 2016)	DC1: I am comfortable with choosing this university over others	0.91
	DC2: I feel good about choosing this university over others	0.89
	DC3: Whether or not it is 'the best choice', I am okay with choosing UWA over others	0.75
	DC4: Although I don't know if this university is the best, I feel perfectly comfortable choice I made.	0.83
Student Engagement (Higher Order) (Grillo & Damacena, 2015)	Enthusiasm	0.9
	Attention	0.95
	Social Interaction	0.81
Enthusiasm	ENH1: I feel excited about the course at the university	0.84
	ENH2: I am heavily into this course at the university	0.89
	ENH3: I spend a lot of my discretionary time thinking about the topics of this course at this university	0.81
	ENH4: I am passionate about this course at this university	0.88
Attention	ATN1: Anything related to the subject of the course grabs my attention	0.82
	ATN2: I pay a lot of attention to anything about this course	0.87
	ATN3: I like to learn more about this course	0.76
	ATN4: I focus a great deal of attention on classes of this course	0.82
	ATN5: I spend a lot of time thinking about this course	0.83
	ATN6: I concentrate a lot of things related to this course	0.83

(*Continued*)

Table 1. Continued.

Constructs and Sources	Items	Factor Loadings
Social Interaction	SIN1: In general I like to get involved in discussions with classmates in this course	0.88
	SIN2: I enjoy interacting with like-minded others in the class of this course	0.89
	SIN3: I like to actively participate in the discussions of this course	0.90
	SIN4: In general, I really like to exchange ideas with other people about this course	0.91

checking the reliability, the convergent validity and discriminant validity were assessed. Convergent validity will be assessed using the Average Variance Extracted (AVE), where AVE score greater than 0.50 indicates convergent validity is achieved (Fornell & Larcker, 1981). The AVE scores were greater than 0.50, which means convergent validity was evident. Then, this study assessed the discriminant validity – the square root of the AVE should be greater than the Inter-Correlation (IC) score (Fornell & Larcker, 1981). The assessment shows that the square root values of construct AVE were greater than IC scores, which demonstrates discriminant validity. Table 2 displays the descriptives and measurement properties of the constructs.

For further robustness checks of discriminant validity, we used the Heterotrait-Monotrait (HTMT) ratio (Henseler et al., 2015). These authors note that a cut-off value of 0.90 should be used to check whether there are problems with discriminant validity. The results show that the HTMT ratios were smaller than this cut-off value, which further supports discriminant validity (see Table 3).

5.3. Higher order operationalisation of co-production behaviour and student engagement

Co-production behaviour was measured as a higher-order factor reflecting three dimensions: compliance, individual initiative and civic virtue. Besides co-production behaviour, student engagement was also measured as a higher-order factor reflecting three dimensions: enthusiasm, attention and social interaction.

The CR and AVE of the first-order dimensions exceeded the threshold levels of 0.60 and 0.50 respectively. The CR of co-production behaviour ranges from 0.87–0.95, whereas the

Table 2. Reliabilities, correlations and validities.

	CA	CR	1	2	3	4	5	6	7
1. Attitude	0.90	0.94	**0.83**						
2. Subjective Norm	0.88	0.93	0.56	**0.81**					
3. Personal Control	0.65	0.81	0.40	0.36	**0.59**				
4. Goal Intention	0.93	0.87	0.34	0.43	0.54	**0.87**			
5. Co-production	0.90	0.92	0.33	0.15	0.30	0.34	**0.52**		
6. Decision Comfort	0.87	0.91	0.69	0.49	0.38	0.31	0.22	**0.72**	
7. Engagement	0.94	0.95	0.32	0.14	0.19	0.30	0.51	0.27	**0.57**

Note: CA: Cronbach's Alpha; CR: Composite Reliability; The diagonal values in bold indicate the average variances extracted (AVE).
The scores in the lower diagonal indicate inter-construct correlations (IC)

Table 3. Heterotrait-Monotrait (HTMT) ratio.

	1	2	3	4	5	6	7
1. Attitude							
2. Subjective Norm	0.62						
3. Personal Control	0.51	0.48					
4. Goal Intention	0.35	0.47	0.69				
5. Co-production	0.39	0.22	0.41	0.39			
6. Decision Comfort	0.76	0.56	0.51	0.34	0.28		
7. Engagement	0.34	0.16	0.24	0.33	0.55	0.29	

AVE ranges from 0.63–0.87. The CR of student engagement ranged from 0.92–0.94, whereas the AVE ranged from 0.68–0.80. The R^2 values of the first-order dimensions exceeded the threshold levels of 0.50 – for co-production behaviour ranging from 0.52–0.86, whereas for student engagement ranging from 0.66–0.90. Moreover, the correlations between the first-order dimensions, for both co-production behaviour and student engagement, are less than their factor loadings on the higher-order construct. The correlations between compliance, individual initiative and civic virtue ranged from 0.40–0.74, whereas the correlations between enthusiasm, attention and social interaction ranged from 0.57–0.82.

Table 4 shows that the bootstrapping critical ratios of the reflective outer-measurement model are significant (> 1.96). Path coefficients from the first-order to the higher-order dimensions indicate strong factor loadings – ranging from 0.72–0.93 for co-production behaviour and 0.81–0.95 for student engagement. These findings provide additional support for co-production behaviour and student engagement being higher-order constructs.

5.4. Hypotheses testing

Through a bootstrapping procedure (5000 subsamples), the inner model was evaluated to test the research hypotheses. Table 4 shows the results of the model and hypotheses testing.

The results do not support H1 (PC = 0.03, $p > 0.05$) that attitude is positively related to goal intention. H2 (PC = 0.25, $p < 0.001$) and H3 (PC = 0.44, $p < 0.001$) are supported, which indicates the positive association of subjective norm and personal control with goal

Table 4. Result of structural equation analyses.

Hypothesis	Relationship	PC	t-value
H1	Attitude → Goal Intention	0.03	0.44^{ns}
H2	Subjective Norm → Goal Intention	0.25	3.69***
H3	Personal Control → Goal Intention	0.44	7.32***
H4	Goal Intention → Co-production	0.34	5.91***
H5	Goal Intention → Decision Comfort	0.31	4.22***
H6	Co-production → Engagement	0.47	8.63***
H7	Decision Comfort → Engagement	0.17	3.01**
Variance explained (R^2)			
Goal Intention		0.35	
Co-production		0.12	
Decision Comfort		0.10	
Engagement		0.29	

Note: PC: Path Coefficient; ** $p < .001$; ***$p < .001$

intention. Results also find support for H4 (PC = 0.34, $p < 0.001$) and H5 (PC = 0.31, $p < 0.01$), which state that goal intention is positively associated with co-production and decision comfort. Finally, H6 (SPC = 0.47, $p < 0.001$) and H7 (SPC = 0.17, $p < 0.01$) find support. These findings related to H6 and H7 indicate that co-production and decision comfort are positively associated with engagement.

5.5. Post-hoc mediation role of co-production behaviours and decision comfort

Next, we tested the mediating roles of co-production behaviour and decision comfort on the relationship between goal intention and student engagement. Bootstrapping procedure with 5000 resamples was performed to test the mediation effects utilising model 4 in PROCESS v3.0 (Hayes & Preacher, 2013). First, to test the mediating effect of co-production behaviour, goal intention was put as an independent variable, co-production behaviour as a mediator, student engagement as the dependent variable and decision comfort as a covariate. The bias-corrected confidence intervals (95%) are 0.0701 and 0.2152 where the indirect effect coefficient is 0.1387. This means that co-production behaviour mediates the relationship between goal intention and student engagement. Since the direct effect of goal intention on student engagement is significant (SPC = 0.1255, $p < 0.05$), the mediation is complementary mediation (Zhao et al., 2010). Afterwards, the mediating effect of decision comfort was checked. Goal intention was put as the independent variable, decision comfort as the mediator, student engagement as the dependent variable and co-production behaviour as a covariate. The bias-corrected confidence intervals (95%) are 0.0071 and 0.0900 where the indirect effect coefficient is 0.0407. This means that decision comfort mediates the relationship between goal intention and student engagement. Since the direct effect of goal intention on student engagement is significant (SPC = 0.1255, $p < 0.05$), the mediation is complementary mediation (Zhao et al., 2010).

6. Discussion

The analysis was undertaken in multiple stages. First, the reliability and validity measures were captured to establish the theoretical background of the constructs. The validity and reliability analyses using AVE and CR support the constructs' structures. We also show robust discriminant validity of the constructs (using the Heterotrait-Monotrait method) used in the conceptual framework.

Second, we prove the integrity of higher dimensional constructs of our conceptual model, namely: a) co-production behaviour and b) student engagement. Furthermore, we also show students' co-production of knowledge as a second-order construct. This finds support in the study of Podsakoff et al. (2000).

The findings did not find support in favour of the first hypothesis (H1) which proposed a positive relationship between a student's attitude and her goal intention. However, positive relationships between a) subjective norm and student goal intention (H2) and b) personal control and student goal intention (H3) were found. Furthermore, the hypotheses stating a positive relationship between goal intention and co-production (H4) and decision comfort (H5a) were supported. The final two hypotheses positing a positive

correlation between student engagement and both student co-production and decision comfort (H6 and H7 respectively) were also supported.

Finally, decision comfort was found to be a mediator in the relationship between a student's goal intention and her engagement level.

Thus, we conclude that the hierarchical structure of the student engagement construct is a valid one.

6.1. Contributions

The results contribute to the current body of knowledge in several ways. First, most of the recent studies focused on examining student engagement use self-determination theory (Chiu, 2022), behavioural reasoning theories (Tani et al., 2021) and others as the key theoretical underpinnings. This study deviates and makes one of the early attempts to explore student engagement through a TPB perspective which is different from the existing literature that uses a unidimensional view from the psychological, socio-cultural or behavioural perspectives (Chan et al., 2022; Kahu, 2013; Rather, 2018; Wong & Liem, 2021). Secondly, the literature claims students' intentions significantly influence their engagement (Tani et al., 2021). Our results further build on this conclusion that the relationship between intention and engagement is mediated by their decision comfort. This finding is a novel addition to the literature (Gravett & Winstone, 2022). Additionally, our results highlight that relationship between intention and engagement is mediated by their co-production behaviour. This is consistent with the results proposed by Elliott et al. (2021). This additional perspective adds to the importance of co-production behaviour and decision comfort as antecedents of student engagement (Tarı Kasnakoğlu & Mercan, 2022). Third, the literature explains that decision comfort created a significant influence on consumers' overall decision evaluations and meaningful downstream consequences on marketing-relevant variables such as choice commitment and the likelihood of recommendation (Parker et al., 2016). By determining the positive and significant consequential impact of decision comfort on student engagement and further by identifying goal intention as a possible antecedent of decision comfort, our results strengthen the nomological network of decision comfort (Parker et al., 2016). Fourthly, studies conducted in HEI confirmed global motives comprising of attitude, subjective norms, and perceived control as an aggregate construct to influence student intention towards engagement (Tani et al., 2021). The study deviates by determining the impact of each of the factors of global motives on student intention towards engagement (Chen & Zimitat, 2006; Malmström & Öqvist, 2018).

6.2. Managerial implications

This study's findings have important implications for university management. Our findings suggest that decision comfort act as a significant antecedent of student engagement. Decision comfort is driven by affect-laden cues (Hilken et al., 2017; Parker et al., 2016). Therefore, providing service comfort and connecting emotionally with students (Kumar & Pansari, 2016) may act as strong enablers of student engagement. To engage students, management should focus on providing tangible and intangible infrastructure

that may assist them to connect emotionally with the university. One such avenue could be on inculcating narratives having positive emotional content.

Also, co-production behaviour was found to act as a significant antecedent of student engagement. Therefore, management should focus on providing collaborative environment/learning spaces between students and teachers or students and students that will also increase engagement. This finding is also consistent with existing research by Xerri et al. (2018), who signify that a cordial student-teacher relationship invokes more questions/*feedback and* enables greater clarification on ways to reduce their workloads and provide study structures. This means that a better teacher-student relationship is an important social factor because it leads to higher student engagement in academic activities.

Therefore, contrary to the existing studies, *overall,* we show that the level of student comfort and not the outcome of a student effort drives a student's level of knowledge co-production. In most scenarios, the HEIs lack the resources to provide student comfort. In the absence of such support from the HEIs, students depend on their friends to attain their desired levels of decision comfort to actively participate in knowledge co-creation. Such friendship-induced engagement and co-production of knowledge enhance the ingenuity of the students' approaches to co-create knowledge and make learning a more attractive proposition. This type of flexible and fun-filled learning environment should provide HEIs with ideas to co-create knowledge at zero cost (Tarı Kasnakoğlu & Mercan, 2022).

Finally, our findings reveal that subjective norms and behavioural control were related to students' intentions. This implies students are more academically engaged when there is assistance from HEI in persuading them to attain higher goals. Social pressure to behave in a certain way also drives students' intentions to engage, Therefore, university management may get students more engaged by providing flexible facilities that enable students to create and maintain social relationships with their peers and, consequently, such facilities help in creating the right setting for engagement and eventually assists in transferring the implicit part of their knowledge and academically engage them more.

6.3. Limitations and directions for future research

This study has some limitations. Although we provide a robust view of student engagement to reduce ambiguity, more work is required to reach a unanimous view of student engagement (Rather & Sharma, 2019). Future studies should use this study's findings as a base to work towards that goal.

Firstly, the research model tested in this study is not exhaustive and hence the threat of omitted variable bias exists. Future studies should explore the possible presence of other antecedents and consequences of student engagement to overcome the omitted variable bias (Heilporn et al., 2021).

Secondly, while this paper integrates the theoretical underpinnings of TPB, future research may consider integrating other and/or complementary theoretical lenses into its investigation, including the resource-based view (Hollebeek, 2019) relationship marketing theory (Vivek et al., 2014), service logic (Grönroos, 2008), regulatory engagement theory (Higgins, 2006; Higgins & Scholer, 2009), protection motivation theory; (Rather, 2021a) engagement theory (Pansari & Kumar, 2017) and others to enhance further theoretical understanding of student engagement.

Thirdly, the study suggests that decision comfort plays a major role in understanding student engagement. We encourage future studies to give serious emphasis on decision comfort-engagement relationships across other B2C sectors/contexts and compare their significance.

Fourthly, the study adopted a quantitative method over a limited time frame and might not offer the full effect of co-production behaviour and decision comfort on student engagement. Therefore, future studies with a mixed methods research design capable of enhanced insights and/or a longitudinal research design that tracks co-production activities should be undertaken to validate the findings.

Note

1. Social efficacy indicates one's self-belief to attain goals (Bandura, 2001).

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