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Digitally Engaged Consumers: A Multi-Level Perspective of Higher Education Actors and Their Technology Readiness

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Introduction

Advances in digital technology and innovation have fundamentally changed the way Higher Education (HE) communities, interact, consume and co-create value (Freberg and Merle 2016; Neier and Zayer 2015). However, differences have persisted between the potential of technology enabled learning and the less consistent realities of technology use within university learning and teaching (Henderson et al. 2015). Therefore, a key aim of this research is to examine how technology readiness of students influences their interaction, engagements, and value co-creation with staff. Through applying the lens of value co-creation, i.e. where value is co-created among actors through their active role of engagement, interactions and behavioural commitment to creating an experience (Ranjan and Read 2016), this study makes theoretical and managerial contributions to firstly, consumer's technology readiness in HE and secondly, how this technology readiness influences their value co-creation behaviours. In addition, a conceptual model is developed, drawn from preliminary qualitative findings with students and lecturers, as well as the technology adoption literature (e.g. Davis 1989; Parasuraman 2000; Parasuraman and Colby 2015) in order to address how the consumption of technology influences value co-creation behaviour in HE.

In keeping with the terminology in the marketing literature this research uses the terms consumers and employees. However, it is important to note *we do not claim that students are consumers*, as recommended by Woodall et al. (2014), rather they are *actors* that interact with other actors (Storbacka et al. 2016) e.g. employees and university staff that engage with and work in the same service environment in order to co-create value. In examining a dyadic perspective, between students and staff, our framework suggests that the level of an actors Technology Readiness (TR) is an antecedent to Digital Technology Satisfaction (DT-SAT) which influences Value Co-Creation behaviours (VCCb). The paper briefly discusses these three areas of literature, then presents the conceptual model and hypotheses. Finally, the methodology is highlighted followed by the findings from study 1 and the implications for theory and management.

Literature

Technology Readiness (TR)

There is recognition within the literature that technology plays a critical role in the delivery of services (Barrett et al. 2015). Of particular importance to understanding the role that technology plays, is the need to investigate an individuals' willingness to engage in the technologies a service organisation offers. According to Parasuraman (2000), customers (i.e. an actor's) TR needs to be taken into consideration in order to predict and better understand an individual's perceptions and behaviours about new and emerging technologies. Parasuraman (2000, p 308) refers to TR as *'people's propensity to embrace and use new technologies for accomplishing goals in home life and at work'* [italics authors own]. This construct consists of four dimensions: optimism, innovativeness (which are facilitators of technology usage), discomfort, and insecurity (which are inhibitors of technology usage).

Underlying this construct is the acknowledgement that technology has been shown to simultaneously trigger both positive and negative feelings (Westjohn et al. 2009). Recognising this paradox Parasuraman (2000) suggests that one or other of these feelings will exhibit relative dominance in the individual. Thus, in general the individuals' attitude towards technology will range on a continuum from strongly positive to strongly negative. As such, there is strong evidence for the ability of TR to predict the usage of technology-based services and more recently TR as a predictor of digital web based technologies has been found (Parasuraman and Colby, 2015).

Digital Technologies in HE

As daily usage of Digital technologies have become the norm, they have also become an integral aspect of the university student experience (Henderson et al. 2015). Students have access to a wide range of educational and administration resources that are accessible online and via multiple devices, for example, time-table apps, course registration services, online learning platforms, library catalogues, Blackboard apps to name a few. These digital resources enable students to easily engage with their programmes and modules but also with the key actors within the University such as lecturers, other students, student unions, and administration staff. This multi-level digital engagement facilitates co-creation activities that all actors within the service organisation can benefit from improved communication or wellbeing (Anderson and Ostrom 2015; Rosenbaum 2015). Additionally, the recent rapid uptake, at firm level, of social media platforms such as Twitter (Junco et al. 2011) and Facebook (Cao et al. 2013) compliment and accelerate value co-creation behaviours. In light of these technological advancements this research considers Digital technologies to include Web Applications, Online Learning Environments, and Social Media Networks as digitally enabled service platforms that support valuable co-creative environments.

Value Co-Creation Behaviours (VCCB)

According to Grönroos and Gummerus (2014, p. 222) 'value is uniquely, experientially and contextually perceived and determined by customers' and can evolve and change throughout the customer's value creation process'. This value creation changes as customers engage in the co-ideation, co-design and co-development of services (Grönroos and Voima 2013). Given the fluidity of value, conceptualising and measuring value has raised considerable debate within the literature (Ranjan and Read 2016; Yi and Gong 2013). Although, engagement, interaction, experience and self-service are considered important elements in the value-co-creation process (Pinho et al. 2014; Ranjan and Read 2016; Storbacka et al. 2016).

In particular, Vargo (2011) indicated that value co-creation can be interpreted as a form of engagement. There have been various definitions within the literature outlining what customer

engagement is (see, Breidbach et al. 2014, for a review), however, the behavioural manifestation has been a key focus of consumer engagement value research as it goes beyond a transactional approach (Kumar et al. 2010). In their development of a value co-creation measurement, Yi and Gong (2013) focused on the behavioural dimensions. They note that early research has identified two types of behaviours for value co-creation: participation behaviour and customer citizenship behaviour. In line with this, this research focuses on the behavioural dimension of value co-creation, i.e. a value co-creation behaviour (VCCb) construct.

To date, there has been limited research examining consumers' readiness to adopt or willingness to use Self Service Technologies or Digital technologies and the influence they have on behaviour (Calvo-Porral et al. 2017; Lin and Hsieh 2006). There is a need to examine digital technologies influence on user's satisfaction as much can be gained by understanding consumer's willingness to engage in the process (Calvo-Porral et al., 2017). Furthermore, as noted by Åkesson et al. (2014) SSTs should facilitate an actor's value co-creation processes. In expanding the research to date, digital technologies as well as SSTs are examined. In addressing these calls within literature, a conceptual model is developed, see figure 1, which examines the influence of Technology Readiness (TR) on Digital Technology Satisfaction (DT-SAT) and its influence on value co-creation behaviours (VCCb). The proposed model, see figure 1, takes into consideration both the customer and the employee levels as the theoretical lens of value co-creation suggests that value co-creation is a multiple actor process.
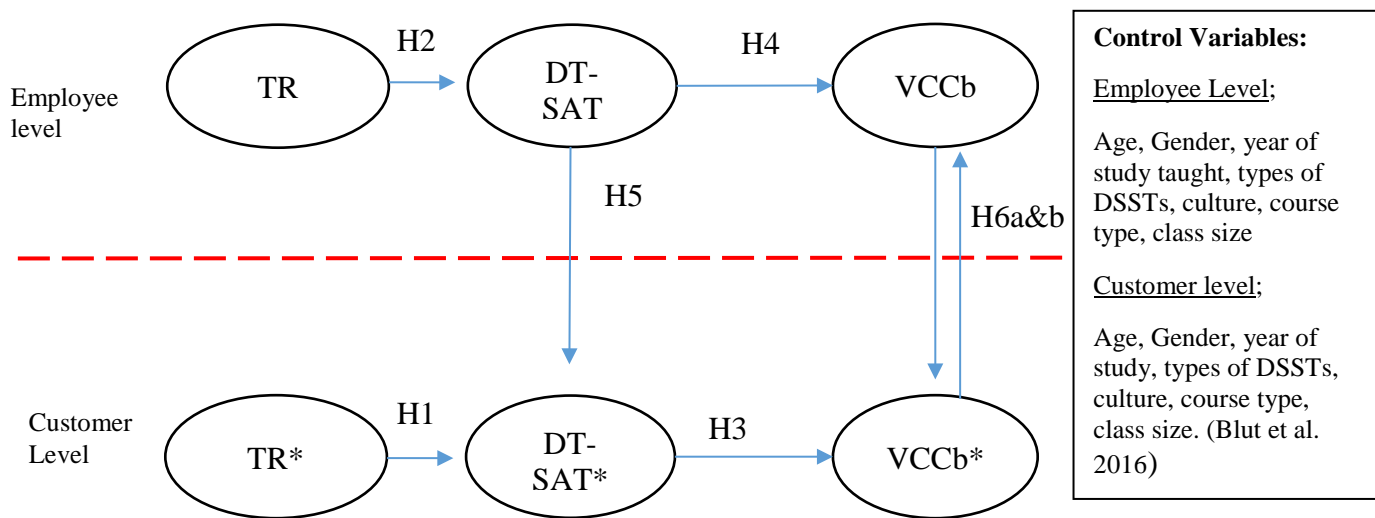
Figure 1: Model with Hypothesis, *Technology Readiness (TR), Digital Technology Satisfaction (DT-SAT). Value Co-Creation behaviours (VCCb).

Hypothesis and Proposed Model

TR relates to customer's satisfaction with SSTs because an individual with a more positive attitude, ability, and willingness to adopt technology is more likely to express satisfaction with SSTs than those with lower TR (Liljander et al. 2006). Satisfaction reflects the degree a consumer derives positive feelings from a service (Fornell et al. 2010; Rust and Oliver 1994). Similarly, employees as actors in the value co-creation process, are themselves being asked to implement types of SSTs and digital technologies and use them in the delivery of the service

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to the customer (Ramaseshan et al. 2015). The employees who embrace the use of technology are likely to be high on optimism and innovativeness and low on discomfort and inhibitors, and thus more likely to express satisfaction with using Digital technologies. The following Hypotheses (H) are developed:

H1 Customers with high level TR have a positive influence on customer Digital Technology Satisfaction

H2: Employees with high level TR have a positive influence on employee Digital Technology Satisfaction

Ramaseshan and Stein (2015) also note that SST has an 'added value' for customers. However value cannot be added, but rather value is co-created by the customer through the application of their resources with the value propositions offered (Gronroos and Gummerus 2014). Digital technologies facilitate value propositions for actors' to engage with in value co-creation processes in order to enhance their customer experiences (Calvo-Porral et al. 2017; Åkesson et al. 2014). Thus this research proposes, that customers who are satisfied with the digital technology on offer are more likely to participate in value co-creation behaviours, which is core to the service experience. In a similar vein, employees who are satisfied with the digital technology on offer will have a positive influence on their value co-creation behaviours (VCCb). In line with this the following hypotheses were developed:

H3 Customer Digital Technology Satisfaction has a positive influence on VCCb

H4: Employee Digital Technology Satisfaction has a positive influence on VCCb

Åkesson et al., (2014) highlights that companies strive to design SST that provide value propositions to the consumers. Through this process, companies are encouraging employees to implement SST or digital technologies in order to provide value propositions to the consumer. Though considerable research has examined customer SST satisfaction (Lin and Hsieh 2006), the need to examine employee digital technology satisfaction and its influence on customer digital technology satisfaction is also crucial. If employees are satisfied with the digital technology that they are implementing as part of the value propositions, then this could influence customer digital technology satisfaction. In line with the satisfaction mirror, which stipulates that employee satisfaction leads to customer satisfaction (Heskett et al. 1997), the following hypothesis is proposed:

H5 Employee Digital Technology Satisfaction has a positive influence on Customer Digital Technology Satisfaction

Meyer and Schwager (2007) suggest that a customer experience results from interactions with SST, employees and other customers. Customer experience, relates to the concept of the service experience. This research uses the term service experience, as this is a more inclusive term which also reflects the employee side of the value co-creation activities. Furthermore, it resonates with Holbrook's (2006) definition of value, which implies that value is a function of interaction between actors, e.g. consumers and employees. Parasuraman and Colby (2015) and Ramaseshan and Stein (2015) both suggest that it is vital that customers and employees successfully embrace technology offerings if they are to co-create value. As noted the concept of value co-creating occurs between actors (Grönroos 2012), and thus the research examines how employee VCCb and customer VCCb are influenced by each other. Thus the hypotheses states:

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H6a Employee VCCb has a positive influence on Customer VCCb

H6b Customer VCCb has a positive influence on Employee VCCb

Methodology

In taking a positivistic view, this research will administer questionnaires across four institutions in Ireland, South Korea, United Kingdom and USA. Firstly, these four institutions will provide a cross cultural perspective, which is of keen interest to Management of HE as well as scholars (Parasuraman and Colby, 2015). Secondly, given the fee differences across the institutions it will be of interest to examine the level of student's participation and involvement in value co-creation behaviours across countries. Thirdly, as noted previously, differences have persisted between the potential of technology enabled learning and the realities of using technology within teaching (Henderson et al. 2015). As such, examining what technology students actually use across the different countries and how this influences their value co-creation with staff could provide information on what technology should be offered to students in their learning.

The items used for the scales are based on past research (Lin and Hsieh 2006; Parasuraman and Colby 2015; Yi and Gong 2013). These scales were tested in study 1. For Study 1, a Web-based survey of undergraduate (UG) students in South Korea was conducted. A total of 150 UG students on a dedicated university email list were invited to participate; 98 accepted the invitation and completed the survey, which gave a high response rate of 65%. The respondents were offered an incentive of KRW 5,000 (USD 4) to complete the survey. Study 2 will collect data from 400 staff and 1000 students across the four Universities, (this will be completed by the time of conference). Study 2 will use HLM to analyse the dyadic data and test the proposed model.

Findings

Study 1

To estimate the measurement model at the student level (i.e. H1 and H3, see figure 2), a composite-based structural equation modelling (SEM) was applied, which offers a more general and realistic measurement approach than covariance-based SEM in that it relaxes the strong assumption that a common factor explains all the covariance between a block of indicators and does not impose any restrictions on the covariance between the same construct indicators. Instead, a composite-based SEM forms composites as linear combinations of their respective indicator, and these linear combinations serve as proxies for the conceptual variables under investigation (Henseler et al. 2016; Henseler et al. 2015). Analysis shows that the measurement models meet the assessment criteria. In support of convergent validity of the scales, all indicators load significantly ($p < .05$) and substantially (> 0.70) on their hypothesized factors, see table 1 (Hair et al. 2010). The composite reliabilities for all variables exceed the cut off value of 0.70, and the average variance extracted (AVE) for all focal variables exceeds the 0.50 benchmark, demonstrating that each construct has acceptable psychometric properties, see table 2. Furthermore, all heterotrait-monotrait (HTMT) ratio values are lower than the threshold value of 0.85. In addition, neither of the 95% bias-corrected and accelerated confidence intervals (CIs) of the HTMT ratio of correlations statistic includes the value 1.00, thus confirming discriminant validity (Henseler et al. 2015).

The model, see figure 2, demonstrates good explanatory power, as the R2 values are .65 for digital technology satisfaction and .77 for value co-creation behaviours. H1 and H3 are both accepted.
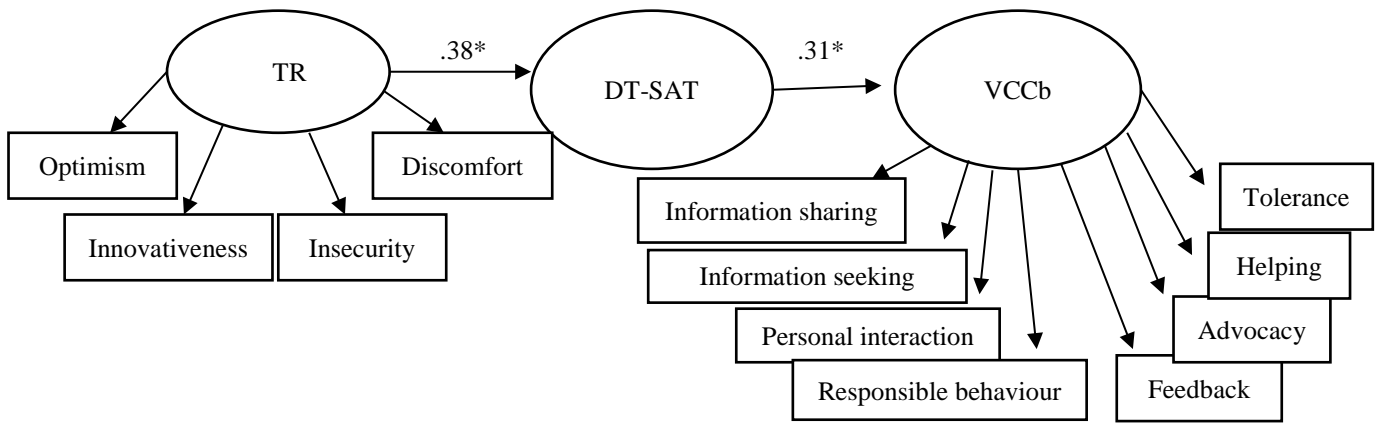
Figure 2: Model at student level, TR=Technology Readiness, DT-SAT= Digital Technology, VCcB= Value Co-creation Behaviour, * p < .001

Discussion and Conclusion

The preliminary findings from study 1 suggest that TR has a positive influence on customer Digital Technology Satisfaction and that this leads to value co-creation behaviours. From this research, a deeper understanding of how TR influences value co-creation behaviours has become apparent. For example, students who felt they were TR indicated that they were more likely to be satisfied with the digital technology on offer. Furthermore, student's digital technology satisfaction explained 31% of the variance in value co-creation behaviours. The more researchers can learn about how to influence value co-creation behaviours in HE, the better the value offerings universities can start to provide, e.g. focussing in on using student apps to support student learning and engagement.

As well as supporting H1 and H3, study 1 validates the scales being used, and provides strong foundations for the next stage of the research. Study 2* will allow for measurement of all constructs, Hypotheses and for TR to be examined across different environments e.g. countries with different cultures and technological infrastructures can provide a deeper understanding of it and its influences (Parasuraman and Colby 2015). Furthermore, in developing their VCCb scale, Yi and Gong (2013) also suggested a cross cultural examination would be beneficial to practitioners at firm level. By adopting the TR 2.0 (Parasuraman and Colby 2015) and the recent value co-creation behaviour scales (Yi and Gong 2015), this paper deepens our understanding of consumers and employees perceived likelihood to adopt emerging technologies and the influence this has on value co-creation behaviours. Given that the emphasis in the academic literature has focused on customer value co-creation, it is vital to examine interactions between key actors e.g. customers and employees and the influence that digital technologies can have on their value co-creation behaviours. For HE service providers the model can effectively proposition suitable technology offerings for staff e.g. academics and administrators, to provide to students based on both staff and students TR and thus influence their value co-creation behaviours with other actors.

* Data from study 2 will be collected and analysed in time for the conference.

Constructs and measurement items	Loading
Customer technology readiness	**.87**
Optimism	
New technologies contribute to a better quality of life.	
Technology gives me more freedom of mobility.	
Technology gives people more control over their daily lives.	
Technology makes me more productive in my personal life.	
Innovativeness	.91
Other people come to me for advice on new technologies.	
In general, I am among the first in my circle of friends to acquire new technology when it appears.	
I can usually figure out new high-tech products and services without help from others.	
I keep up with the latest technological developments in my areas of interest.	
Insecurity	.92
Expansion of digital technology in the University lowers the quality of staff relationships by reducing personal interaction.	
I do not feel confident conducting work related to my programme or University department with a place that can only be reached online.	
I worry that information I make available over the internet may be misused by others.	
I prefer talking to a person rather than interacting with an automated system when I call the University.	
Digital technology makes it too easy for University staff to spy on people.	
I do not consider it safe to provide personal information over the internet.	
Discomfort	.74
Technical support at the University are not helpful because they do not explain things in terms I understand.	
It seems my University friends are learning more about the newest technologies than I am.	
There should be caution in replacing important people tasks with technology because new technology is not dependable.	
I do not consider it safe to conduct work related to my module / course / programme online.	
Technology always seems to fail at the worst possible time.	
If I buy a high-tech product or service I prefer to have the basic model over one with a lot of extra features.	
Student digital technology satisfaction	
Overall, I am satisfied with the digital technology offered by the University.	.95
The digital technology offered by the University exceed my expectations. The digital	.96
technology by the University are close to my ideal digital technology.	.91
Customer value co-creation behaviour	
Information sharing	.92
I clearly explained what I wanted the staff to do.	
I gave the staff proper information.	
I provided the necessary information so that the staff could perform his or her duties.	
I answered all the staff's service-related questions.	
Information seeking	.92
I have asked other students for information on what higher education offers.	
I have searched for information on where to go for higher education.	
I have paid attention to how others behave to use higher education well.	
Personal interaction	.91
I was friendly to the staff.	
I was courteous to the staff.	
I was kind to the staff.	
I was polite to the staff.	
I did not act rudely to the staff.	
Responsible behaviour	.89
I performed all the tasks that are required to engage with the higher education experience.	
I adequately completed all the expected behaviours.	
I fulfilled the responsibilities as set out by the University.	

I followed the staff's directives or orders.		
Feedback		.93
If I have a useful idea on how to improve the higher education service, I let the university know.		
When I receive good service from the University, I comment about it.		
When I experience a problem, I let the University know about it.		.94
Advocacy		
I said positive things about my University and the staff to others.		
I recommended my University and the staff to others.		
I encouraged friends and relatives to use my University.		
Helping		.93
I assist other students if they need my help.		
I help other students if they seem to have problems.		
I teach other students to use the higher education service correctly.		
I give advice to other students.		
Tolerance		.87
If the higher education service is not delivered as expected, I would be willing to put up with it.		
If the staff makes a mistake during the delivery of the service, I would be willing to be patient.		
If I have to wait longer than I normally expected to receive the service, I would be willing to adapt.		

Table 1. Constructs and factor loading

	M	SD	CR	AVE	TR	DT-Sat	VCCb
Technology Readiness (TR)	5.96	1.91	.92	.75	1		
Digital technology satisfaction (DT-SAT)	5.82	1.72	.96	.89	.31	1	
Value co-creation behaviours (VCCb)	5.47	1.85	.97	.84	.38	.26	1

Table 2. Descriptive Statistics of Study Variables

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