A Business Model for Private Higher Education in a Digitalized Era

Senny Luckyardi[1], Yogi Suprayogi[2], Eddy Soeryanto Soegoto[3] and Gordana Pesakovic[4*]

Abstract.
The higher education sector is embroiled in a continuous digital transformation process, resulting in a significant need for an innovative business model need for an innovative business model. Private universities are required to survive amidst competition in this digital era. The need for an innovative business model is reinforced by the fact that Student Satisfaction (SS) still needs to improve at Private Universities in West Java, Indonesia. This research develops a Smart University Image (SUI) as a novelty in a new business model to increase SS. In addition, SUI was developed because brand image theory was deemed insufficient and inconsistent from a semantic or functional standpoint when applied to a smart university (SU). The SUI dimensions developed are Cognitive, Conative, Emotive, and Collaborative. This research also aims to develop and test the SUI model synthesized from Relationship Marketing. A quantitative method is used in this research using proportional purposive sampling data collection techniques. The questionnaire distribution was based on the criteria of respondents who were second and third-year students at private universities (PU) in West Java, Indonesia, and were classified as SU. The data analysis used Structural Equation Modeling (SEM), partial model test, and Sobel test to determine the strength of the mediation role in this research model. The findings of this research state that the SUI relationship significantly affected SS, which means it is appropriate to be applied to new business models in the higher education sector. The recommendations from this research findings are that private universities need to develop business models that apply high technology to create student engagement and SS in the framework of a smart university.

Keywords: Private Higher Education, Smart University Image, Student Satisfaction

JEL: G23, M31

[1,3]Department of Management, Universitas Komputer Indonesia, Bandung, Indonesia
[2*]Department of Business Administration, Universitas Telkom, Bandung, Indonesia. Email:

yogisuprayogi@telkomuniversity.ac.id. **Corresponding author*
[4]Webster University, United States of America

1. Introduction

Business models are needed by universities which are required to develop in the digital era for an increasingly competitive global world (Zarandi, 2022; Hall,2018 & Corso, 2020). Globalization creates massive disruption in Higher Education (HE) institutions, bringing radical changes in their management caused by social and technological changes (Felix, 2021). Disruptive HE institutions urge HE management to change their entire conventional business model towards adopting digital technology, including marketing and service (Becker et al., 2017). This has also caused various paradigm changes in higher education business models (Rossouw, 2022 & Indrajit, 2006).

Higher education institutions currently use marketing techniques that require a business model since universities and their students are seen in the present paradigm as similar to commercial organizations and their customers (Soegoto, 2013). Marketing activities are becoming more prevalent in the field of education, particularly in higher education institutions (HEIs) across the world that cannot be separated from the fierce competition among universities for new students, the diversification of funding sources, the rise of new service providers, and modifications to fundamental laws of HEIs (Han, 2019).

Private Universities (PU) as higher education institutions whose survival and sources of operational funds are very dependent on the number of students and are required to pay more attention to student satisfaction and retention (Purwantoro, 2019 & Romli, 2020). On the other hand, Figure 1.1 shows that many private universities have closed because the number of students continues to decline. In the first quarter of 2022, of the 2,982 PU, there are around 1,600 private universities with less than 500 students. In detail, there are 476 PUs with less than 100 students, 912 PUs with 100-500 students, and 336 PUs with no students (Forlap, 2022).

The low number of students at PU is also due to the autonomy of the management of State Universities (SU), which is expanding the capacity of student admissions by opening notable entry routes outside the Student's National Selection of State University (Gunawan, 2017). This increasingly narrows PU's opportunities to get students. Apart from that, the "State University Minded" phenomenon, namely the opinion that SU graduates are much better than PU graduates, has also tightened PU competition in getting

students (Resmi, 2017).

In the context of competition in the digital era, numerous higher education institutions (HEIs) have implemented the Smart University (SU) tagline as an approach to cultivate a positive perception and sustain a competitive position within the higher education sector (Musselin,2018 Spry, et al., 2018). (Tikhomirov. 2015) represent SU as an idea that involves the complete development of all educational operations. (Uskov, et al 2016) defines SU as integrating information and communication technology with faculty expertise to enhance the quality of educational processes and outcomes in various aspects of university operations, including commercial activities, research, and other university operations. Based on his research, "smart" in education refers to the development of technologies such as smart boards, smart screens, and wireless connectivity that can be accessible from anywhere. Meanwhile, Min-Allah, N., and S. Alrashed (2020) characterize Smart Campus as a recent concept that enables educational institutions to integrate smart technology with infrastructure to enhance assistance. (Cesur et al., 2019) explained that the SU concept aims to provide excellent service in a dynamic and proactive manner for students, lecturers, and other university staff by leveraging the Internet of Things.

Unfortunately, the Smart University criteria in Indonesia are not yet systematized (Zakir et al., 2019). Many institutions' brand image-based strategic plans focus on various phrases such as Smart University, Smart Education, Digital University, Cyber University, Intelligent University, and related subjects, which are often challenging to identify from one another. Smart University has yet to be widely researched as a recent business model in education. Theories about smart universities highlight IT, such as computers, mobile devices, sensors, and networks (Rico-Bautista, et al., 2019; & Mohamed, 2017), but cannot explain new concepts and paradigms of socio-technology that involve students, lecturers, and administrative staff and creates new business models to increase student satisfaction.

This research aimed to propose a new construct revision of the university image or brand image, namely Smart University Image (SUI), as a part of a new business model in HEI as a novelty. SUI may incorporate the concept of a smart university's brand image in terms of semantics and content, ensuring that the intelligent impression is appropriately linked to its branding strategy. It is becoming increasingly necessary in the highly competitive education market to maintain the correct brand terminology, with the same standards of the smart university and holistic concept, to

develop a good business model to boost student satisfaction. The method used in the research is a quantitative method with the Structural Equation Model as an analysis tool.

2. Literature Review

In the concept of Relationship Marketing (RM), Smart University (SU) is synonymous with creating quality relationships between universities and students through the use of information technology. The increasing adoption of the internet and social media by higher education institutions has encouraged the development of various networks, service quality and marketing strategies (Dwivedi., Y., et al., 2021) resulting in significant changes in communication media, market disposition and consumer behavior (Hoekstra, J.C and Leeflang, P.S; 2020).

The definition of RM put forward by Grönroos., C (1994) includes six different dimensions from the history of marketing definitions, namely:

1. RM seeks to create new value for customers and then share it with customers.
2. RM recognizes the key role that customers have as buyers and in determining the value they want to achieve.
3. RM is seen as designing and aligning processes, communications, technology, and people to support customer value.
4. RM represents an ongoing cooperative effort between buyers and sellers.
5. RM recognizes customer's life time value
6. RM seeks to build a chain of relationships within the organization, to create the value that customers desire, and between the organization and its key stakeholders, including suppliers, distribution channels, intermediaries, and shareholders. The six dimensions of RM-based theory are SU goals which make it possible to produce good relationships with consumers, increase consumer satisfaction, increase consumer retention and attract potential consumers with the help of information systems (Cordiaz, M., 2017). The main goal of implementing technology at SU is so that institutions are able to adapt, so that the institution can operate effectively and efficiently. (Putri., L.R., 2021)

Smart University (SU) is a brainchild, idea and phrase with global recognition as a “brand”. “Branding” is “the practice of creating a name, symbol, or design that identifies and differentiates a product from other products” (Bohle, M., and Marone, E., 2021). That basic commercial idea shows the semiotic relevance of how signs and symbols form meaning, and branding the phrase (symbol) “Smart University” means giving it an identity that differentiates this sign from others. There are many

interpretations of "SU", and its implications for marketing strategy practice are very clear (Cocoli., et al., 2016; Uskov., et al., 2016; Berdnikova, L. F., et al., 2020). The Smart University Image (SUI) idea labels a particular brand image in a university strategy that considers SU as a value to increase student satisfaction. Thus, SUI is offered as a school of thought and can be found at the intersection of several frameworks (brand image, marketing strategy, engineering, digitalization and professional management).

The SUI structure is offered as a term that explains the branding of a collection of ideas and activities, as well as philosophical thoughts, in the context of a university's brand image. SUI, in turn, refers to "a wide range of applied and fundamental research areas, as well as related engineering, marketing disciplines, and commercial endeavors." Together, they discuss the function of brand image and the intersection of brand image and digital adoption in universities, known in this context as “Smart Universities”. SUI is defined for a proper branding strategy; for example, because of the strong relationship between theoretical concepts and marketing practice so that it can establish a more comprehensive concept and make its measurement easier.

The word smart refers to increased standards and innovative solutions for smart pedagogical practices (Shoikova, E., et al., 2017; Cesur, R., et al., 2019) explains the SU concept, aimed at providing excellent services dynamically and proactively for students, lecturers , and university employees in the age of the Internet of Things. According to Rico-Bautista., et al (2019), smart education and smart universities are growing rapidly and developing in sectors that reflect the integration of (1) smart objects, smart systems and smart environments (2) computer engineering and computer science, smart technology (3) state of the art smart systems, educational hardware and/or software, and (4) teaching strategies, innovative pedagogy, and learning methodologies based on smart objects, smart systems, and smart environments.

Semiotically, the definition of brand image as an abstract visual idea (for example, status) comes from a large number of more or less symbolic indications. These signals can be seen in brand messaging, store signage, social media text, and various other communication sources. In other words, the notion of image and positioning must be defined within a specific conceptual framework according to a basic semiotic perspective (Rossolatos, G. 2018). Therefore, a special conceptual framework, namely

Smart University, which is also implemented as an integrated IoT-based space needs to be applied and integrated into the idea of "image". For this reason, SUI is offered as a material source for the formation, reinterpretation, and strengthening of embedded brand ideologies and the subjectivities that accompany them, because space functions as a material container for brand meanings and values to be semiotized, consumed, and appropriated. From a semiotic point of view, if we define a university brand as something related to "the sum total of ideas, emotions and associations attached to a particular institution", then the new construction of SUI will be more appropriate to define the brand of a smart university than the phrase brand image (BI).

3. Methodology

The subjects in this research are students at private universities (PU) which are Smart Universities in West Java Province which are rated by the Smart Indonesia Initiative Association in 2022. Dependent and independent variables are components included in the research object. The dependent variable is Student Satisfaction (Y), with the mediator variables Student Engagement (X6), Smart University Image (X5), and Value Co-Creation (X4). At the same time, E-Information Quality (X3), E-Service Quality (X2), and Technology Readiness (X1) are independent variables.

This study covers descriptive and verification research based on the factors evaluated. Descriptive research aims to describe something, for example, the characteristics of a group (organization, producer, or consumer) related to the typology or phenomenon pattern studied as the final result of the research (Malhotra, 2015). The verification method is also used in this research to get the truth about a hypothesis. The research objective was achieved by collecting data related to efforts to increase student satisfaction at private universities in West Java Province using the SUI approach. This follows the statement of Arifin, M. B. U. B. (2018), who explains that verification research is carried out as a test of existing scientific facts, namely principles, processes, evidence, concepts, and practices of that science. This research also uses an explanatory survey method, which collects data from population groups to understand the research object.

This research uses a group of people who attend private universities in West Java Province, which include Smart Universities in the large campus category (Telkom University and Binus University), medium campus category (Widyatama University and Maranatha University), and small campus category (Garut Institute of Technology). A minimum sample size

of 202 people was obtained based on the sample calculation formula used (see Table 3.1).

Table 1: Calculation of the Number of Samples from Each PU

University	**Population**	**Sample**
Tel-U	7.554	74
Binus	10.085	98
Widyatama	2.102	20
Maranatha	1.566	15
Institut Teknologi Garut	257	3
Total	21.564	210

Source: Studentship Division and Calculation Results.

The hypothesis was tested using a t-value with a significance level of 0.05 and n (sample) degree of freedom. Siswono (2012) explains that the t value in LISREL version 25.0 is the Critical Ratio (C.R.) value. If the probability value (P) or Critical Ratio (C.R.) is smaller than 0.05, then H0 is refused (null hypothesis is accepted). The output estimate displayed in the total effect column determines the magnitude of the effect.

Figure 2.4 depicts the SUI developed for the business model, which originates from the Value Co-Creation inference, which originates from the Service-Dominant Logic theory of Consumer Satisfaction, by proposing Smart University Image (SUI) as a mediator originating from Relationship Marketing Theory.

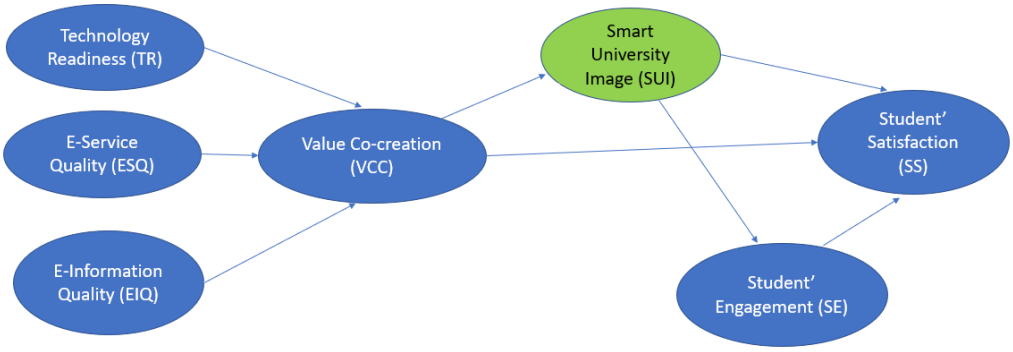

Figure 1. Smart University Image Business Model in the Digital Era Study at Universities in West Java

The criteria for accepting or rejecting the central hypothesis in this research are:

1. Ho: $\rho \leq 0$ There is no positive influence between TR, ESQ, and EIQ on VCC at private universities in West Java.
   Ha: $\rho > 0$ There is a positive influence between TR, ESQ, and EIQ on VCC at private universities in West Java.
2. Ho: $\rho \leq 0$ There is no parallel mediating impact of SUI, SE, and VCC on SS at private universities in West Java.
   Ha: $\rho > 0$ There is a parallel mediating influence of SUI, SE, and VCC on SS at private universities in West Java.

3. Discussion

Based on the research paradigm, two structural models will be tested in this research. The results of statistical testing on the structural model measurements in this research resulted in an endogenous latent variable value of:

VCC = 0.18*TR + 0.55*ESQ + 0.26*EIQ, Errorvar. = 0.23, $R^2 = 0.77$
SUI = 0.71*VCC, Errorvar. = 0.50, $R^2 = 0.50$
SE = 0.23*VCC + 0.68*SUI, Errorvar. = 0.27, $R^2 = 0.73$
SS = 0.059*VCC + 0.66*SUI + 0.26*SE, Errorvar. = 0.14, $R^2 = 0.86$

Remarks:
TR = Technology Readiness

ESQ = E-Service Quality
EIQ = E-Information Quality
VCC = Value Co-Creation
SUI = Smart University Image
SE = Student Engagement
SS = Student Satisfaction

The findings of research hypothesis testing are shown in Figure 2.

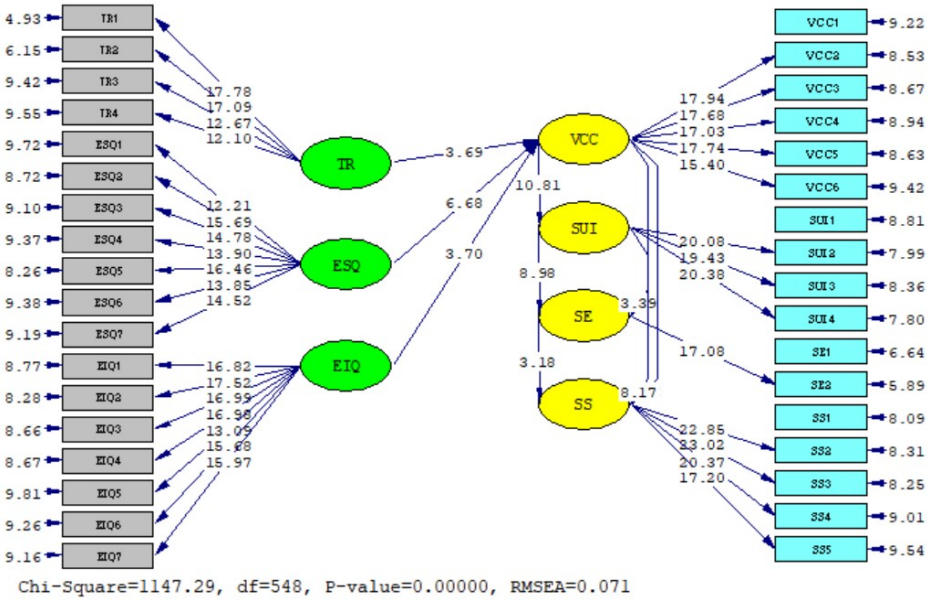

Figure 2. The findings of research hypothesis testing

Source: Results of research data processing.

Tables 2 and 3 show the direct and indirect effects as well as the total effect of each variable. All hypotheses containing parallel mediation are accepted.

The SUI link had the greatest total effect, influencing SS considerably via SE mediation (0.612). Meanwhile, the VCC relationship has the lowest total effect, influencing SS considerably via SE mediation at 0.063.

Table 2. Calculation of the Number of Samples from Each PU

Hypothesis	Variable	Path Coefficient	t Count > 1.96	F Count	Conclusion
H1	TR --> VCC	0.18	3,69		*Accepted*
H2	ESQ --> VCC	0.55	6,68		*Accepted*
H3	EIQ --> VCC	0.26	3,70		*Accepted*
H4	TR, ESQ and EIQ --> VCC			235,464 > 2.65	*Accepted*
H5	VCC -> SUI	0.71	10,81		*Accepted*
H6	VCC --> SE	0.23	3,39		*Accepted*
H7	SUI --> SE	0.68	8.98		*Accepted*
H8	VCC dan SUI --> SE			286,593 > 3.04	*Accepted*
H9	SUI -> SS	0.66	8,17		*Accepted*
H10	SE --> SS	0.26	3.18		*Accepted*
H11	VCC --> SS	0.059	1.16		*Rejected*
H12	SUI dan VCC --> SS			432,048 > 2.65	*Accepted*
Mediation Hypothesis					
H13	VCC --> SUI --> SE		6.907		*Accepted*
H14	SUI --> SE --> SS		2.997		*Accepted*
H15	TR --> VCC --> SUI		3.492		*Accepted*
H16	ESQ --> VCC --> SUI		5.682		*Accepted*
H17	EIQ --> VCC --> SUI		3.501		*Accepted*
H18	VCC --> SE --> SS		2.312		*Accepted*

Table 3 Direct and Indirect Effects

	Direct		**Indirect**
VCC →SUI→SE	0.23	0.053	0.71 x 0.68 = 0.483
VCC →SE→SS	0.059	0.003	0.23x 0.26 = 0.063
SUI→SE→SS	0.66	0.436	0.68 x 0.26 = 0.177
TR→VCC→SUI	0.18	0.032	0.18 x 0.71 = 0.128
ESQ→VCC→SUI	0.55	0.303	0.55 x 0.71 = 0.391
EIQ→VCC→SUI	0.26	0.068	0.26 x 0.185 = 0.391

	Direct		**Indirect**
VCC --> SUI --> SS	0.059	0.003	0.71 x 0.66 = 0.469

Table 4. Total Effect

Variable	**Path Coefficient**	**Direct**	**Indirect**	***Total Effect***
VCC --> SUI --> SE	0.230	0.053	0.71 x 0.68 = 0.483	0.536
VCC --> SE --> SS	0.059	0.003	0.23 x 0.26 = 0.060	0.063
SUI --> SE --> SS	0.660	0.436	0.68 x 0.26 = 0.177	0.612
VCC --> SUI --> SS	0.059	0.003	0.71 x 0.66 = 0.469	0.472

According to the research results, it is shown that TR has a significant effect on VCC, which means that hypothesis 1 is accepted. TR and VCC have a positive correlation, which means that increasing TR will raise VCC and vice versa. This is consistent with prior studies undertaken by Payne et al. (2008) and Rialti et al. (2022), which found that technology enables collaboration and value creation (VCC). Furthermore, the value of information technology is increasingly being developed and realized through the behaviors of the VCC's numerous stakeholders (Kohli et al., 2008). According to Huang and Rust (2018), firms who want to capitalize on digitalization preparation in services must find ways to collaborate with customers (VCC) by improving market efficiency and data integration. In line with this research, Kurcharska (2019) explains that digital transformation and technological readiness are revolutionizing the service ecosystem and triggering consumer feedback. Dahl (2020) added that digital transformation and technological readiness are changing how services are created and delivered and how they can be evaluated directly by consumers. Recent research from Manser Payne (2021) indicates potential benefits from value co-created through digital services.

ESQ has a significant effect on VCC, which means that hypothesis 2 is accepted. The relationship directions among ESQ and VCC are positive, indicates that as TR increases, so does VCC, and vice versa. The results of this study are consistent with the findings of Parasuraman et al. (2005), who found a substantial link between ESQ and VCC. In greater detail, the research findings state that e-SQ refers to the extent to which a website adds value to users in order to support efficient and successful shopping, purchase, and delivery. Rowley (2006) defines "e-service" as an act,

business, or performance assisted by information technology, such as the Internet, information kiosks, and mobile devices. Simply said, E-SQ is the production of value with a focus on Web services.

EIQ significantly affects VCC, which means that hypothesis 3 is accepted. The relationship directions among EIQ and VCC are positive, which means that an increase in TR will result in a corresponding increase in VCC and vice versa. J. Philip Lathrop's research (2000) shows results that align with the findings of this research. The research states that Co-creation is a competitive imperative. Both quality and quantity of information are highly valued by consumers, and being accessible when searching for information is a satisfying experience for consumers. If an organization does not pay attention to this, then competing companies will. Prahalad, C.K. and Ramaswamy, V. (2000) explain that with access to information, consumers know how to make far better educated choices. This feedback causes organizations in various industries to gain impact over value generation and innovate their business practices.

Simultaneously, Technology Readiness (TR), E-Service Quality (ESQ), and E-Information Quality (EIQ) have a substantial impact on Value Co-Creation, so hypothesis 4 is accepted. The results of this research support previous research where ESQ and EIQ simultaneously influence switching behavior in online transportation (Suryawardani, B., and Wulandari, A., 2020), where switching behavior is one of the behaviors in VCC (Xu et al., 2021). Other research that aligns with the findings of this research was also carried out by Flavián et al. (2022), which indicates that TR and ESQ simultaneously influence VCC in Artificial Intelligence (AI) analytics.

These research data suggest that VCC has a significant impact on SUI, hence hypothesis 5 is accepted. The link between VCC and SUI is positive, which indicates that as VCC increases, so does SUI, and vice versa. Simoes and Soares (2010) conducted previous research that supports this study, stating that the internet has significantly impacted how domestic and international students gain knowledge, information, and experiences concerning colleges' current reputations.

The research findings show that VCC has no substantial impact on SE, so hypothesis 6 is rejected. The relationship direction between VCC and SE is positive, which means that an increase in VCC will result in a corresponding increase in SE and vice versa. Previous research findings consistent with this research are those by Bovill (2014) and Marquis (2018), who state that although VCC is considered valid, it is often considered time-consuming and has a high risk, so customer engagement decreases. Other research on

co-creation in making higher education curricula also explains the same thing: flexibility is needed in pedagogy to create SE and not just create a shared curriculum. On the other hand, at Smart University, many lecturers use social networking platforms and applications such as WhatsApp, Facebook, YouTube, or LMS to communicate easily with their students (Sobaih et al., 2020). Digital learning processes, in which Students interact more with online learning systems and are distant from their tutors and peers, can impact student involvement and, in turn, outcomes. Student involvement in technology-mediated learning is a primary challenge that can hinder online learning effectiveness. (Henrie, et al., 2015 & El-Sayad, et al., 2021).

This research shows that simultaneously, VCC and SUI have a significant effect on SE, so hypothesis 8 is accepted. The findings of this research follow prior research, which stated that Value Co-Creation and Destination Image simultaneously influence tourism engagement (Glyptou, 2021). This research explores the construction of destination image and VCC in triggering tourist involvement in formulating, promoting, re-creating, and restoring cognitive and affective images of tourist destinations.

SUI significantly affects SE, which means that hypothesis 9 is accepted. The relationship of direction between SUI and SE is positive. This means that when SUI increases, then SE will increase and vice versa. The findings of this study confirm previous research, which showed the same results. Aldridge and Rowley (1998) explained that university staff and university image are the main factors influencing student gratification. According to Chandra T et al. (2019), teaching and learning qualities are vital to academics since they specify the overall quality and image of the institution in the long run, ultimately increasing student happiness. Meanwhile, et al. (2020) emphasized the importance of lecturers' performance both within and outside the classroom in shaping the university's image for student loyalty, motivation, and satisfaction.

SE has a significant effect on SS, which means that hypothesis 10 is accepted. The relationship of direction between SE and SS is positive. It means that when SE increases, SS will increase and vice versa. Martin and Bolliger (2018) also emphasized that involvement is essential for student learning and student satisfaction in their learning process. Therefore, student involvement can increase the satisfaction of the student. Muzammil., et al. (2020) confirmed that SE significantly affects SS. Student and teacher involvement can increase student satisfaction. In this context, students will enjoy seeing how their instructors monitor their progress and difficulties

through feedback (Skovholt, 2018 & Zhang et al 2018). In reality, information and communication technologies allow students to participate directly in their everyday academic lives in a comfortable and familiar environment, which improves their learning process and increases learning efficiency (Yip et al., 2019).

VCC does not significantly affect SS, so hypothesis 11 is rejected. Contrary to the results of many studies that show the influence of VCC on SS, this research confirms that the VCC variable cannot fully explain its role regarding the level of influence on consumer satisfaction because this variable requires other variables that ensure the creation of joint value towards co-creation of value, not co-creation, destruction value. Several studies show that VCC does not support the creation of consumer satisfaction. This can be mitigated by other factors that guarantee a certain degree of shared value creation in the positive perception that customers have of the good, service, or brand (Nguyen and Leblanc, 2001), related to the value perceived as well as the students' satisfaction (Brown and Mazzarol, 2009) specifically, the reputation of universities. VCC needs to be tempered by the university's reputation because consumers' negative attachment (negatively valenced engagement) is manifested through negative ideas, impressions, feelings, and behavior toward the brand over the interactions (Hollebeek and Chen, 2014). Thus, the moderation of a good university reputation will reinforce the connection between VCC and customer satisfaction.

This research shows that simultaneously, SUI and SE have a significant effect on SS, so hypothesis 12 is accepted. This is understandable by previous research, which explains that SE measures behavioral and emotional engagement. Several experts state that engagement, especially emotional engagement, is a feeling of liking or disliking the university, lecturers, assignments, and the school environment (Epstein and McPartland, 1976), which is closely related to the image of a university. Experts reach a consensus regarding the source of an organization's reputation, which can only be assessed by its stakeholders (Avenarius 1993 & Lee 1999). Therefore, the image of a university is closely related to the assessment perceived by students as one of its stakeholders through feelings of likes or dislikes or the extent to which they are involved, as defined by SE.

SUI is proven to be able to mediate the connection between VCC and SE, so hypothesis 13 is accepted. The findings of this research confirm prior research, which indicates that VCC, such as the use of various applications

by students, filling in the evaluation system for lecturers and education staff, forms a smart image at a university (SUI) and thus will form higher student involvement (SE) through efforts to understand the technology and interaction with lecturers and instructors. A powerful company reputation is a valuable intangible asset because it represents quality, trustworthiness, and uniqueness. Clear promise and the company brand usually need more organizations that are strong in branding (Balmer, 2010).

The findings of this study state that SE can mediate the connection between SUI and SS, so hypothesis 14 is accepted. The results of this research can be explained because learning satisfaction represents students' feelings and attitudes toward the learning process or the level of perceived fulfillment inherent in a person's wish to learn, which is caused by the learning experience (Topala and Tomozii, 2014). A person's wish to learn from a student makes him involve himself in the learning process, where this involvement is influenced and often depends on the reputation of a university. Suppose a university's reputation is good in its students' eyes. In that case, creating shared values by students will lead to engagement actions that support existing programs (behavioral engagement), such as student involvement in student organizations. On the other hand, if the image of a university is not good in the eyes of its students, it will stimulate feelings of dislike (emotional engagement) and perhaps low student involvement as a form of disappointment with the university.

The findings of this study state that VCC can mediate the connection between ESQ and SUI, so hypothesis 16 is accepted. This research's findings align with prior research by Tariq, Z., et al., (2022), which stated that VCC can mediate in forming a university's image. Students are involved in and collaborate with the institution through continuous interactive activities, which, in turn, improves the university's brand reputation (Hatch and Schultz, 2010). Innovation of any kind has the power to revive consumer brand loyalty. VCC is a business strategy that promotes open innovation for clients within an organization, particularly in the service sector (Kumar & Kandoi, 2018).

The findings of this study show that VCC can mediate the connection between EIQ and SUI, so hypothesis 17 is accepted. One of the bases that supports this research is the theory of reasoned action (TRA) proposed by Fizbein and Azbein (1975). This theory explains, understands, and predicts human behavior. TRA proposes that people are conscious of the consequences of their acts and thus base their choices on available information. In the digital era, this theory underlies much of the motivation

for EIQ to increase good feedback for consumers and ultimately improve the good image of a company and increase the satisfaction of customers (Rao et al., 2021).

The findings of this study also indicate that SE can mediate the connection between VCC and SS. Therefore, hypothesis 18 is accepted. This means that VCC can form SS by creating SE. Previous research has proven that VCC significantly impacts satisfaction (Opata et al., 2020), while other research has also proven that VCC and citizenship behavior are positively related to member satisfaction (Liu & Jo, 2020). Lien Nguyen and Tom Meng Yen Lin (2021) examined the role of VCC in its contribution to student satisfaction, perceived university reputation, and favorable rumors. They explained that non-profit organizations, for instance universities, are beginning to notice a variety of stakeholders like faculty, alums, and students collaborating to generate value based on VCC (Nguyen and Yen Lin, 2021). To preserve a successful image and reputation, institutions must place an increasing emphasis on creating customer value (Foroudi et al., 2018).

Total effect

The highest total effect was provided by the Smart University Image (SUI) relationship, which significantly influenced Student Satisfaction (SS) through the mediation of Student Engagement (SE) of 0.612. Meanwhile, the lowest total effect is shown through the VCC relationship, which influences SS significantly through SE mediation of 0.063.

These findings explain that the SUI construct can increase SS through increasing SE. Previous research conducted by Bowden, Tickle, and Naumann (2021) confirmed the results of this research. It showed that Affective, social, cognitive, and behavioral aspects of student engagement (SE) are interrelated and, when well-integrated, impact student achievement and perception of higher education. Another research that aligns with this research's findings is by Vivek et al. (2012), who found that the cognitive and affective components of SE integrate experiences and emotions to create the university's reputation. According to Brodie et al. (2011), a company's capacity to engage its customers in today's dynamic and interactive business environment is critical to its overall performance. It can lead to improved sales, brand recognition, competitive advantage, and profitability.

4. Conclusion

The research results show that the levels of TR, ESQ, EIQ, VCC, SE, and

SUI at private universities in West Java, considered smart universities, are in the relatively high category. The implications of the results of this research show that TR, ESQ, EIQ, VCC, SE, and SUI already tend to be good at private universities but need to continue to improve to reach the high and very high categories. Based on the research results, TR, ESQ, EIQ, VCC, SE, and SUI significantly influence SS at private universities in West Java, which are considered smart universities. Most students are digital natives and can use technology well. However, the integral application of technology is an essential factor in smart universities. Social communication in the smart university community is vital in facilitating communication between lecturers, platforms, and students. In this interaction, students can develop critical thinking skills, create shared value and involvement, and create a smart university image, which ultimately increases student satisfaction.

SUI as a new construct is proposed, and SE can mediate the parallel relationship between VCC and SS. Analysis of the overall impact reveals that the most outstanding value is shown by the mediating impact of SE on the relationship between SUI and SS, which is then successively shown by the value of SUI, which mediates VCC on SS and VCC on SE, as well as the value of SE which mediates VCC on SS. It means SUI is appropriate concept to be applied in business model for private universities. This research implies that creating value together with students at private universities can increase SS, as long as the portion is right through good smart-university image measures.

The research results on the new construct of SUI with the addition of the proposed new dimension, namely the collaboration dimension, show that this collaboration dimension gives a lower score than the other dimension scores. This new dimension in the new SUI construct reflects "smart" human resource management and collaboration with various parties, such as government and industry, which have been carried out at large and medium-sized universities, while small universities are still initiating these collaborations. The implication is that collaboration is an essential element in SUI. Close collaboration enables technological innovation to fully meet the needs of stakeholders and overcome challenges in the smart university environment.

References

Aldridge, S., & Rowley, J. (1998). Measuring customer satisfaction in higher education. *Quality assurance in education*, 6(4), 197-204. https://doi.org/10.1108/09684889810242182

Arifin, M. B. U. B. (2018). Buku ajar metodologi penelitian pendidikan. Umsida Press, 1-143.

Avenarius, H. (1993). Introduction: Image and public relations practice. *Journal of Public Relations Research*, 5(2), 65-70. https://doi.org/10.1207/s1532754xjprr0502_01

Balmer, J. M. (2010). Explicating corporate brands and their management: Reflections and directions from 1995. *Journal of Brand Management*, 18, 180-196.

Becker, S. A., Cummins, M., Davis, A., Freeman, A., Hall, C. G., & Ananthanarayanan, V. (2017). NMC horizon report: 2017 higher education edition (pp. 1-60). The *New Media Consortium*.

Berdnikova, L. F., Sergeeva, I. G., Safronov, S. A., Smagina, A. Y., & Ianitckii, A. I. (2020). Strategic management of smart university development. In *Smart Education and e-Learning 2020* (pp. 293-303). Springer Singapore

Bovill, C. (2014). An investigation of co-created curricula within higher education in the UK, Ireland and the USA. *Innovations in Education and Teaching International*, 51(1), 15–25. https://doi.org/10.1080/14703297.2013.770264

Bowden, J. L. H., Tickle, L., & Naumann, K. (2021). The four pillars of tertiary student engagement and success: a holistic measurement approach. *Studies in Higher Education*, 46(6), 1207-1224. https://doi.org/10.1080/03075079.2019.1672647

Brodie, R. J., Hollebeek, L. D., Juric, B, & Ilic, A. (2011). Customer Engagement: Conceptual Domain, Fundamental exchange on customer value and loyalty. *Journal of Business Research*, 59, 449 – 456. https://doi.org/10.1177/109467051141170

Brown, R. M., & Mazzarol, T. W. (2009). The importance of institutional image to student satisfaction and loyalty within higher education. *Higher education*, 58, 81-95. https://doi.org/10.1007/s10734-008-9183-8

Cesur, R., Torkul, O., Cedimoğlu, İ. H., & Seda, U. Ç. A. R. (2019). Intelligent campus implementation for smart cities. *Sakarya University Journal of Science*, 23(6), 1218-1224. https://doi.org/10.16984/saufenbilder.376218

Chandra, T., Hafni, L., Chandra, S., Purwati, A. A., & Chandra, J. (2019). The influence of service quality, university image on student satisfaction and student loyalty. *Benchmarking: An International Journal,* 26(5), 1533-1549. https://doi.org/10.1108/BIJ-07-2018-0212

Coccoli, M., Maresca, P. & Stanganelli, L. (2016). Cognitive computing in education. Journal of eLearning and Knowledge Society, 12(2), 59-69.
Cordiaz, M. (2017). Penerapan Smart Campus sebagai Pendukung Kegiatan Pendidikan dalam Tri Dharma Perguruan Tinggi. *Jurnal Informatika Universitas Pamulang*, *2*(2), 77-80.

Corso, R. (2020). Building an innovative and entrepreneurial dimension in an institution of higher education. *Higher Education for the Future*, 7(2), 200-214. https://doi.org/10.1177/23476311209305

Dahl, R. A. (2020). On democracy. *Yale University Press*.

Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., ... & Wang, Y. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, *59*, 102168.

Elsaadany, A., & Soliman, M. (2017). Experimental evaluation of Internet of Things in the educational environment. https://doi.org/10.3991/ijep.v7i3.7187

El-Sayad, G., Md Saad, N. H., & Thurasamy, R. (2021). How higher education students in Egypt perceived online learning engagement and satisfaction during the COVID-19 pandemic. *Journal of Computers in Education*, 8(4), 527-550. https://doi.org/10.1007/s40692-021-00191

Epstein, J. L., & McPartland, J. M. (1976). The concept and measurement of the quality of school life. *American Educational Research Journal*, 13(1), 15–30. https://doi.org/10.2307/1162551

Felix, J. J. (2021). Higher education in times of instability and disruption: Rethinking notions of values, value creation and instructional practices in Vietnam and beyond. *Frontiers in Communication*, 6, 647471.

https://doi.org/10.3389/fcomm.2021.647471

Fishbein, M, & Ajzen, I. (1975). Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research, Reading, MA: Addison-Wesley.

Flavián, C., Pérez-Rueda, A., Belanche, D., & Casaló, L. V. (2022). Intention to use analytical artificial intelligence (AI) in services–the effect of technology readiness and awareness. *Journal of Service Management*, 33(2), 293-320. https://doi.org/10.1108/JOSM-10-2020-0378

Foroudi, P., Gupta, S., Sivarajah, U., & Broderick, A. (2018). Investigating the effects of smart technology on customer dynamics and customer experience. *Computers in Human Behavior*, *80*, 271-282.. https://doi.org/10.1016/j.chb.2017.11.014

Glyptou, K. (2021). Destination image co-creation in times of sustained crisis. In *Revisiting Value Co-creation and Co-destruction in Tourism* (pp. 102-124). Routledge. https://doi.org/10.1080/21568316.2020.1789726

Grönroos, C. (1994). Quo vadis, marketing? Toward a relationship marketing paradigm. *Journal of marketing management*, *10*(5), 347-360.

Gunawan, R. (2017). Brand Association Perguruan Tinggi Jawa Barat Menghadapi Persaingan Masyarakat Ekonomi Asean (MEA) dan Dunia. *Jurnal Visionida,* 3(1), 54-63. https://doi.org/10.30997/jvs.v3i1.970

Hall, H. (2018). The marketisation of higher education: symptoms, controversies, trends. *Ekonomia i Prawo. Economics and Law*, *17*(1), 33-42.. https://doi.org/10.12775/EiP.2018.003

Han, S., & Xu, X. (2019). How far has the state 'stepped back': An exploratory study of the changing governance of higher education in China (1978–2018). *Higher Education*, *78*(5), 931-946.https://doi.org/10.1007/s10734-019-00378-4

Hatch, M., & Schultz, M. (2010). Toward a theory of brand co-creation with implications for brand governance. *Journal of Brand Management.* https://doi.org/10.1057/bm.2010.14

Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technologymediated learning: A review. *Computers & Education*, 90, 36–53. https://doi.org/10.1016/j.compe du.2015.09.005

Hoekstra, J. C., & Leeflang, P. S. (2020). Marketing in the era of COVID-19. *Italian Journal of Marketing*, *2020*(4), 249-260.

Hollebeek, L. D., & Chen, T. (2014). Exploring positively-versus negatively-valenced brand engagement: a conceptual model. *Journal of Product & Brand Management,* 23(1), 62-74. https://doi.org/10.1108/JPBM-06-2013-0332

Huang, M. H., & Rust, R. T. (2018). Artificial intelligence in service. *Journal of Service Research,* 21(2), 155-172. https://doi.org/10.1177/1094670517752459

Indrajit, R. E., & Djokopranoto, R. (2006). Manajemen perguruan tinggi modern (Vol. 1). Andi.

Kohli, R., & Grover, V. (2008). Business value of IT: An essay on expanding research directions to keep up with the times. *Journal of the association for information systems*, 9(1), 1. https://doi.org/10.17705/1jais.00147

Kucharska-Newton, A. M., Stoner, L., & Meyer, M. L. (2019). Determinants of vascular age: an epidemiological perspective. *Clinical chemistry*, 65(1), 108-118. https://doi.org/10.1108/VJIKMS-06-2019-0098

Kumar, S., & Kandoi, M. (2018). Co-creation a new method of building brand loyalty & innovation. *International Journal of Management (IJM)*, 9(6).

Lathrop, J. P., Ahlquist, G. D., & Knott, D. G. (2000). HEALTH CARE'S NEW ELECTRONIC MARKETPLACE Consumer-friendly, self-managed health plans are coming to corporate America. The result: a revolution and a $400 billion industry. *STRATEGY AND BUSINESS*, 34-43.

Latip, M. S. A., Newaz, F. T., & Ramasamy, R. (2020). Students' Perception of Lecturers' Competency and the Effect on Institution Loyalty: The Mediating Role of Students' Satisfaction. *Asian Journal of University Education,* 16(2), 183-195. https://doi.org/10.24191/ajue.v16i2.9155

Lee, T. W., Mitchell, T. R., & Sablynski, C. J. (1999). Qualitative research in organizational and vocational psychology, 1979–1999. *Journal of Vocational Behavior, 55(2),* 161-187. https://doi.org/10.1006/jvbe.1999.1707

Lin, M. Y., Grandgeorge, P., Jimenez, A. M., Nguyen, B. H., & Roumeli, E.

(2023). Long-Term Hindrance Effects of Algal Biomatter on the Hydration Reactions of Ordinary Portland Cement. *ACS Sustainable Chemistry & Engineering,* 11(22), 8242-8254. https://doi.org/10.1021/acssuschemeng.2c07539

Liu, J., & Jo, W. (2020). Value co-creation behaviors and hotel loyalty program member satisfaction based on engagement and involvement: Moderating effect of company support. *Journal of Hospitality and Tourism Management,* 43, 23-31. https://doi.org/10.1016/j.jhtm.2020.02.002

Malhotra, N. K. (2015). Essentials of marketing research: A hands-on orientation. Essex: Pearson.

Marquis, C., & Bird, Y. (2018). The paradox of responsive authoritarianism: How civic activism spurs environmental penalties in China. *Organization Science*, *29*(5), 948-968. https://doi.org/10.1287/orsc.2018.1212

Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online learning*, *22*(1), 205-222. https://doi.org/10.24059/olj.v22i1.1092

Min-Allah, N., & Alrashed, S. (2020). Smart campus—A sketch. *Sustainable cities and society*, *59*, 102231. https://doi.org/10.1016/j.scs.2020.102231

Musselin, C. (2018). New forms of competition in higher education. *Socio-Economic Review*, *16*(3), 657-683.https://doi.org/10.1093/ser/mwy033

Muzammil, M., Sutawijaya, A., & Harsasi, M. (2020). Investigating student satisfaction in online learning: the role of student interaction and engagement in distance learning university. *Turkish Online Journal of Distance Education,* 21(Special Issue-IODL), 88-96. https://doi.org/10.17718/tojde.770928

Nguyen, L. T. K., Lin, T. M., & Lam, H. P. (2021). The role of co-creating value and its outcomes in higher education marketing. *Sustainability*, *13*(12), 6724. https://doi.org/10.3390/su13126724

Nguyen, N., & Leblanc, G. (2001). Corporate image and corporate reputation in customers' retention decisions in services. *Journal of Retailing and Consumer Services*, 8(4), 227-236. https://doi.org/10.1016/S0969-6989(00)00029-1

Opata, C. N., Xiao, W., Nusenu, A. A., Tetteh, S., & John Narh, T. W. (2020). Customer value co-creation in the automobile industry: Antecedents, satisfaction, and moderation. *SAGE Open*, *10*(3), 2158244020948527. https://doi.org/10.1177/21582440209485

Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). ESQUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research,* 7(3), 213–233. https://doi.org/10.1177/1094670504271156

Payne, A.F., Storbacka, K. and Frow, P. (2008), "Managing the co-creation of value*", Journal of Academy of Marketing Science,* Vol. 36 No. 1, pp. 83-96. https://doi.org/10.1007/s11747-007-0070-0

Payne, E. H. M., Peltier, J., & Barger, V. A. (2021). Enhancing the value co-creation process: artificial intelligence and mobile banking service platforms. *Journal of Research in Interactive Marketing*. https://doi.org/10.1108/JRIM-10-2020-0214

Prahalad, C. K., & Ramaswamy, V. (2000). Co-opting customer competence. *Harvard business review*, *78*(1), 79-90.

Purwantoro, P., & Afrizal, A. (2019, August). Evaluation of items on instruments of consumer attitudes, word of mouth, and decisions of private universities. In *Journal of Physics: Conference Series* (Vol. 1255, No. 1, p. 012092). IOP Publishing.. https://doi.org/10.1088/1742-6596/1255/1/012092

Putri, L. R. (2021). Inovasi Pelayanan Publik Melalui Aplikasi Smart Campus Data Base (Scdb) di Kampus Institut Pemerintahan dalam Negeri. *Jurnal Teknologi dan Komunikasi Pemerintahan*, *3*(2), 1-15.

Rao, K. S., Rao, B., & Acharyulu, G. V. R. K. (2021). Examining ePWOM-purchase intention link in Facebook brand fan pages: Trust beliefs, value co-creation and brand image as mediators. *IIMB Management Review*, *33*(4), 309-321. https://doi.org/10.1016/j.iimb.2021.11.002

Resmi, N. N., & Mekarsari, N. K. A. (2017). Pengembangan perguruan tinggi swasta melalui analisis SWOT. *Pros Semin Revital Tata Kelola Perguru Tinggi Juni*, *2017*(14), 178-91.

Rialti, R., Marrucci, A., Zollo, L., & Ciappei, C. (2022). Digital technologies, sustainable open innovation and shared value creation: evidence from an Italian agritech business. *British Food Journal*, *124*(6), 1838-

1856.https://doi.org/10.1108/BFJ-03-2021-0327

Rico-Bautista, D., Medina-Cárdenas, Y., & Guerrero, C. D. (2019). Smart university: a review from the educational and technological view of internet of things. *Information Technology and Systems: Proceedings of ICITS 2019*, 427-440. https://doi.org/10.1007/978-3-030-11890-7_42

Romli, M. E. (2020). Strategi Pemasaran Perguruan Tinggi Swasta. *Jurnal Media Wahana Ekonomika*, 16(4), 296-302. https://doi.org/10.31851/jmwe.v16i4.3726

Rossolatos, G. (2018). Brand image re-revisited: A semiotic note on brand iconicity and brand symbols. *Social Semiotics*, *28*(3), 412-428.

Rossouw, J. P. (2022). Disruptive Forces towards Innovation in Higher Education Institutions in 2022 and Beyond. *Bulgarian Comparative Education Society*.

Rowley, J. (2006). An analysis of the e-service literature: towards a research agenda. *Internet research*, *16*(3), 339-359. https://doi.org/10.1108/10662240610673736

Shoikova, E., Nikolov, R., & Kovatcheva, E. (2017). Conceptualising of smart education. *Electrotechnica & Electronica (E+ E)*, *52*.

Simões, C., & Soares, A. M. (2010). Applying to higher education: information sources and choice factors. *Studies in Higher Education*, 35(4), 371-389. https://doi.org/10.1080/03075070903096490

Siswono, T. Y. E. (2012, November). Implementasi Pendidikan Karakter dalam Pembelajaran Matematika. In *Prosiding Seminar Nasional Pendidikan Matematika UIN Syarif Hidayatullah Jakarta, Hal* (pp. 1-12).https://doi.org/10.24256/jpmipa.v2i1.101

Skovholt, K. (2018). Anatomy of a teacher–student feedback encounter. *Teaching and teacher education*, 69, 142-153. https://doi.org/10.1016/j.tate.2017.09.012

Sobaih, A. E. E., Hasanein, A. M., & Abu Elnasr, A. E. (2020). Responses to COVID-19 in higher education: Social media usage for sustaining formal academic communication in developing countries. *Sustainability*, *12*(16), 6520. https://doi.org/10.3390/su12166520

Soegoto, E. S. (2013). Entrepreneurship menjadi pebisnis ulung. *Elex Media Komputindo*.

Spry, L., Poorrezaei, M., & Pich, C. (2018). Investigating corporate brand values in higher education. https://doi.org/10.1007/978-3-030-02568-7_92

Suryawardani, B., & Wulandari, A. (2020). Determinant factors of customers switching behavior to customer satisfaction and loyalty in online transportation users in Bandung. *JDM (Jurnal Dinamika Manajemen),* 11(1), 12-26. https://doi.org/10.15294/jdm.v11i1.21432

Tariq, Z., Noor, N., & Rauf, M. (2019). Role of traditional marketing activities in creating university brand image and reputation: Mediating role of customer value co-creation behavior. https://doi.org/110.17605/OSF.IO/FZ8CS

Tikhomirov, V., Dneprovskaya, N., & Yankovskaya, E. (2015). Three dimensions of smart education. In Smart Education and Smart e-Learning (pp. 47-56). *Springer International Publishing*. https://doi.org/10.1007/978-3-319-19875-0_5

Topala, I., & Tomozii, S. (2014). Learning satisfaction: validity and reliability testing for students' learning satisfaction questionnaire (SLSQ). *Procedia-Social and Behavioral Sciences,* 128, 380-386. https://doi.org/10.1016/j.sbspro.2014.03.175

Uskov, V. L., Bakken, J. P., Karri, S., Uskov, A. V., Heinemann, C., & Rachakonda, R. (2017, June). Smart university: conceptual modeling and systems' design. In *International conference on smart education and smart E-learning* (pp. 49-86). Springer, Cham

Uskov, V. L., Bakken, J. P., Pandey, A., Singh, U., Yalamanchili, M., & Penumatsa, A. (2016). Smart university taxonomy: features, components, systems. In *Smart education and e-learning 2016* (pp. 3-14). Springer International Publishing.. https://doi.org/10.1007/978-3-319-39690-3_1

Vivek, S. D., Beatty, S. E. & Morgan, R. M. (2012). Customer Engagement: Exploring customer relationships beyond purchase. *Journal of Marketing Theory and Practice*, 20 2, 127 - 145. https://doi.org/10.2753/MTP1069-6679200201

Xu, F., Tan, J., Lu, L., Li, S., & Qin, L. (2021). How does value co-creation behavior affect destination loyalty? A role-switching perspective. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(5), 1805-1826.

https://doi.org/10.3390/jtaer16050101

Yip, J., Wong, S. H., Yick, K. L., Chan, K., & Wong, K. H. (2019). Improving quality of teaching and learning in classes by using augmented reality video. *Computers & Education*, 128, 88-101. https://doi.org/10.1016/j.compedu.2018.09.014

Zakir, S., Defit, S., & Vitriani, V. (2019). Indeks Kesiapan Perguruan Tinggi dalam Mengimplementasikan Smart Campus. *Jurnal Teknologi Informasi dan Ilmu Komputer*, 6(3), 267-276. https://doi.org/10.25126/jtiik.201963986

Zarandi, N., Soares, A. M., & Alves, H. (2022). Student roles and behaviors in higher education co-creation–a systematic literature review. *International Journal of Educational Management*, 36(7), 1297-1320. https://doi.org/10.1108/IJEM-08-2021-0317

Zhang, Z. V., & Hyland, K. (2018). Student engagement with teacher and automated feedback on L2 writing. *Assessing Writing*, *36*, 90-102. https://doi.org/10.1016/j.asw.2018.02.004