The Study of Undergraduates' Satisfaction and Loyalty in Gocheck System

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Article info

Abstract

This research paper aims to explain the factors that impact undergraduate students' satisfaction and loyalty in Gocheck system. The conceptual framework was developed based on previous three theoretical models, and derived with seven variables for the study namely, image, perceived valve, perceived quality, service quality, satisfaction, trust, and loyalty. The research has applied quantitative approach in data collection and analysis by distributing questionnaires to undergraduate students of three majors who are currently using Gocheck system at Yunnan Normal University, China (n=500). Multistage sampling techniques of judgmental sampling, stratified sampling and convenience sampling were used for data collection. The collected data were analyzed using the Structural Equation Model (SEM) and Confirmatory Factor Analysis (CFA) to confirm model fit, reliability, and validity of the constructs, and test the research hypotheses proposed. The results explicated that undergraduates' loyalty in Gocheck system was formulated from their satisfaction, which the direct antecedents of satisfaction were trust and perceived value, and indirectly affect by perceived quality. Image, perceived quality, and service quality has lack of direct significant effect on satisfaction. Therefore, the higher education institutions, system developers and marketing practitioners were advised to strengthen and promote the system performance, features, and functionalities in order to demonstrate the trust in the system and the advantages from services offered. This could help students by ensuring academic integrity in their scholarly works and foster their satisfaction and repetitive usage in Gocheck system.

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Introduction

Academic institutions are nowadays upholding the importance of academic integrity for transparency and intellectual honesty in scholarly works, especially to ensure the originators of works and ideas are respected. Breaches of academic misconduct can result in disciplinary actions for the scholars. Academic misconduct in this context means any behavior that attempts, taken, or assist others to derive with unfair academic advantage. Academic misconduct includes plagiarism, contract cheating, collusion, and data fabrication (University of Cambridge, 2019). Guo and Ye (2019) viewed that to avoid academic misconduct, it is no longer possible to rely solely on the discipline of the scholars. A rigid mechanism for detecting misconduct activities is recommended to secure academic ethics and integrity. The mechanism should be rapid and accurately operate for falsification detection. Misconduct detection system has been widely used in academic institutions to ensure academic integrity of the scholarly works, as well as academic institutions in China. Academic misconduct is also emphasized in China's education institutions as shown from the study of Mo (2018).

Tong Yuan, a company in China has partnered with numbers of top universities in China such as Hunan Normal University, China University of Geosciences, and Henan University to develop a citation detection system called Gocheck. Gocheck system was officially launched in March 2015 with aim to provide professional paper detection with value-added services according to the needs of users. Gocheck system utilizes powerful data mining technology to integrate and process data for a large-scale of text comparison. The system is a professional writing comprehensive platform that offers wide range of services including paper citation detection, paper format detection, paper writing guidance, and graduate publication management system. Gocheck system has been highly recognized and trusted by number of writers, and rapidly formed a wide influence and popularity in various universities. According to statistics, Gocheck has more than eight million registered users and the detection volume is as high as ten thousand papers a day with less than five minutes for running a transaction. Apart from academic institutions, Gocheck system is also applicable to other institutions that works on scholarly publications or articles such as editorial departments, publishing houses, government offices and scientific research institutions (Bi & Ye, 2019; Liu, Wong, Shi, Chu & Brock, 2014).

At present, breaches of academic misconduct still occur from time to time, hence the detection system is imperative and widely used to promote transparency and intellectual integrity in scholarly works. This paper is conducted to further study the satisfaction and loyalty of undergraduate students who are currently experiencing Gocheck system, hence the case study would be focusing on the higher education institutions of China. The findings aim to encourage the continuous commitment and usage of Gocheck system to improve efficiency in paper detection and foster academic integrity in scholarly publications for the scholars or students. Therefore, the findings would be beneficial to higher education or universities, lecturers, and citation detection system developer to understand the key drivers that can stimulate the users' satisfaction and loyalty in using citation detection system or Gocheck. These insights can be used for their consideration when designing, developing, or selecting the system that fits the needs of the students. Factors studied to explain its impact on undergraduate students' satisfaction and loyalty of Gocheck system were based on previous research of three theoretical models, which consist of image, perceived value, perceived quality, service quality, trust, satisfaction, and loyalty.

The cognition and feeling of a company in the consumers' memory is called company image (Srivastava & Sharma, 2013). Company image is the consequence of what consumer think, believe, undergo, feel, impress, and understand of a company (Dimitriadis & Zilakaki, 2019). The perception that contributes to company image could be on the products or services' reliability, quality, and performance (Cassia, Cobelli, & Ugolini, 2017). Abratt and Kleyn (2012) stated that image indicated the perception or positioning of the interior and exterior stakeholders toward the company. The study of Lee and Lee (2018) showed that when people have a nice feeling of a company's image, they were more likely to estimate the company's products and services in a positive mode. Many scholars believed that the enterprise image in the business-to-consumer has an active influence or positive correlation on customers' satisfaction (Chiu, Zeng, & Cheng, 2016; Dimitriadis & Zilakaki, 2019; Kant, Jaiswal, & Mishra, 2017; Moorthy, Chun T'ing, Ai Na, Sze Xian, & Wei Ling, 2018) According to Chang and Yeh (2017), a company's brand image has an intensity impact on client satisfaction and loyalty, and client satisfaction also affected client loyalty. Further studies of Elsäßer and Wirtz (2017) and Jeong and Kim (2020)

has proven the positive indirect effect of image towards loyalty through satisfaction. The company image can influence customers in two aspects, attitudinal through satisfaction and behavioral through loyalty. Therefore, a company should establish its own brand image and integrate the brand image into client satisfaction and loyalty. The first hypothesis proposed hereafter for the study is:

H1: Image has significant impact on satisfaction.

Perceived value defined by Zeithaml (1988) is the consumer's overall evaluation on the benefits and value received from the products and services. The value perceived by consumer would be based on the profits gained and sacrifices made, for instance money spent, time saving, effort, and convenience (Sanchez, Callarisa, Rodriguez, & Moliner, 2006). Customer perceived value is the fundamental concept for branding and marketing. As the value perceived by customers increases, they would be willing to buy and less likely to find alternatives. Hence, this would result in a long-term relationship with seller or loyalty (Akroush & Mahadin, 2019). Previous studies have showed that perceived value has positive and significant relationship on satisfaction The overall value that significantly impacted satisfaction consist of functional, emotional, and social values (Kim & Park, 2017). Gan and Wang (2017) also emphasized the importance of value that has significant and positive influence on satisfaction and purchase intention of the consumers. The relationship is also consistent with other empirical research which found that the perceived value was considered as one of the key predictors of satisfaction (Chatterjee, Shainesh, & Sravanan, 2018; Gallarza, Ruiz-Molina, & Gil-Saura, 2016; Rasoolimanesh, Dahalan, & Jaafar, 2016). Therefore, the second hypothesis proposed for the study is:

H2: Perceived value has significant impact on satisfaction.

Perceived quality referred to the estimate of the comprehensive advantages or dominance of a product or service by consumers (Zeithaml, 1988). Fornell, Johnson, M.D., Anderson, E.W., Cha, J.S., & Bryant (1996) distinguished perceived quality into product quality and service quality. The opinion made by customers through their experience of product used is called perceived product quality. Moreover, perceived service quality referred to the opinion made by customers after experiencing related services provided by the companies, such as product features and functionalities. García-Fernández et al. (2018) demonstrated the

relationship between perceived quality, perceived value and satisfaction in their research. In their opinion, perceived quality plays a very important role in forecasting perceived value. The quality and features of the product are also important in the study of Russo, Confente, Gligor, and Cobelli (2019) as it has positive impact on customer satisfaction, product selection and their re-purchase decision. Customers would be attracted to the companies that offers products and services with assortment of qualities that met their level of expectation (Hult, Sharma, Morgeson, & Zhang, 2019; Riquelme, Roman, & Iacobucci, 2016). Customers would weigh the benefits received and cost paid while assessing the quality of product or service experienced (Cobelli, Bonfanti, Cubico, & Favretto, 2019). Hence, perception on quality is a crucial antecedent of values and customer satisfaction (Gonçalves, Cândido, & Feliciano, 2020; Kasiri, Guan Cheng, Sambasivan, & Sidin, 2017; Murfield, Boone, Rutner, & Thomas, 2017). Other studies have indicated that quality perceived by customer can directly affect their perceived value, and in turn lead to level of satisfaction (Samudro, Sumarwan, Simanjuntak, & Yusuf, 2020; Suhartanto, Brien, Primiana, Wibisono, & Triyuni, 2020). The hypotheses are then proposed with two causal relationships from perceived quality as the following:

H3: Perceived quality has significant impact on perceived value.

H4: Perceived quality has significant impact on satisfaction.

Service quality was defined as how consumers regarded and evaluated the company and its services (Parasuraman, Zeithaml, & Berry, 1985), which was subjectively assessed through their impression and opinions (Ojasalo, 2019). The success of companies can be guaranteed and recognized from their superior service quality offered (Zeithaml, 2000). With a good balance of service quality offered by service providers and received by the customers, satisfaction on both parties can be attained. The balance can be achieved from understanding the needs of two parties when developing the services (Lee, Lee, & Yoo, 2000; Parasuraman Berry, & Zeithaml, 2002). There are various past research that studied the relationship between perceived service quality and satisfaction as part of customer loyalty program. Hence these studies have indicated the influence of service quality on satisfaction and its indirect impact on customer loyalty (Özkan, Süer, Keser, & Kocakoç, 2020). With a good level of service quality, it would

enable to satisfy the needs and expectation of the customers (Foroudi, Jin, Gupta, Foroudi, & Kitchen, 2018; Gong & Yi, 2018; Ofori, Boakye, & Narteh, 2018; Paiz et al., 2020; Vo, Chovancova, & Tri, 2020). The fifth hypothesis for the study is then propose as:

H5: Service quality has significant impact on satisfaction.

Trust means that based on customer's experience, they have confidence in the benevolence and integrity of the supplier or service provider (Schoorman, Mayer, & Davis, 2007). Benevolence refers to a compassion relationship between two parties that their act would protect the other parties' welfare and are not harmful. Integrity refers to the belief that the act of other party is reliable, consistent, and able to fulfil the promises (Morgan & Hunt, 1994). When consumer trust their supplier or service provider, insecurity in the relationship or interaction would be lesser, encourage good cooperation, then creates the satisfaction that help sustain the positive relationship (Agarwal & Narayana, 2020; Balaji, Roy, & Wei, 2016). Former research has found that trust is essential for maintaining a long-term customer's relationship. It gives the customer's expectancy for future interaction and encourages repurchase intention, therefore trust was found to be a predictor of customer loyalty (Chang & Hung, 2018; Esterik-Plasmeijer & Raaij, 2017; Levy & Hino, 2016; Nadiri, 2016). Also, prior research has proven the significant relationship of trust and customer satisfaction as the security and reliability of products and services provided by the supplier can maximize users' satisfaction (Bricci, Fragata, & Antunes 2016; Jham, 2016, Kao & Lin, 2016; Wahyoedi, 2017). Trust is then hypothesized for two causal relationships as the following:

H6: Trust has significant impact on satisfaction.

H8: Trust has significant impact on loyalty.

Satisfaction is the emotional evaluation from cumulative experience of the products or services offered by the supplier or service provider over time (Song, Wang, & Han, 2019). The customer's emotional evaluation is usually the comparison of products or services performance and their anticipation (Pizam, Shapoval, & Ellis, 2016; Ulaga & Eggert, 2006). Customer satisfaction is one of the prerequisites for creating loyalty. Shaping customer satisfaction over time would create a long-term relationship or loyalty which could help the company to ensure customer retention and lower chances of customer exploring alternatives (Madzík & Shahin, 2021). Previous studies have

highlighted the significance of satisfaction on loyalty. The increased satisfaction would lead to the increase of loyalty due to its positive influence (Ghorbanzadeh, 2021; Jahan, Rahman, Hossain, & Saiful, 2019; Kotler, Armstrong, Harris, & Piercy, 2017; Song et al., 2019). Therefore, the hypothesis is proposed as:

H7: Satisfaction has significant impact on loyalty.

Oliver (1999) and Lam and Shankar (2014) defined loyalty as the consumers' commitment to re-purchase the products or services repetitively in the future, regardless of any conditional situations that may persuade the switching. In the context of marketing studies, loyalty is the relationship between the consumers and brands, products, services, or the company (Bahri-Ammari, Van Niekerk, Ben Khelil, & Chtioui, 2016). Loyalty can be seen as the step that consumers would reach after achieving satisfaction (Mohamed Taheri, Farmaki, Olya, & Gannon, 2020; Woratschek, Horbel, & Popp, 2019), which was highly impacted from factors such as perceived value, perceived quality, and corporate image (Gallarza et al., 2016; Jeong & Kim, 2020; Murfield et al., 2017). Previous research also discussed the cause and effect on trust and loyalty and concluded that trust was the key element to establish and keep relationships with consumers (Chang & Hung, 2018). Further, Leninkumar (2017) found through research that trust was an intermediary between satisfaction and loyalty, which has a remarkable effect on both client satisfaction and loyalty.

Objectives

1. To examine the significance and impact of image, perceived value, perceived quality, service quality, and trust on satisfaction of undergraduate students towards Gocheck system.

2. To examine the significance and impact of satisfaction and trust on loyalty of undergraduate students towards Gocheck system.

3. To highlight research findings for universities, lecturers, and citation detection system developer to understand the determinants of undergraduates' satisfaction and loyalty on citation detection system as presented in the case study of Gocheck.

Conceptual Framework

The conceptual framework was developed based on previous research of three theoretical models. The factors proposed for determining the satisfaction and loyalty were focused on the customers' perceptions or

relationship towards the brand or product and services. Firstly, Ball Coelho, and Machas (2004) studied the effect of image, expectations, perceived quality, perceived value, complaints, satisfaction, communication, trust, and loyalty among the customers in the banking sector. The study used European Customer Satisfaction Index (ECSI) model to explain customer loyalty. Secondly, the previous research of Michael, David, and Yang (2013) studied the relationship between service quality, university image, perceived value, satisfaction, and recommend service. The study surveyed the university students in a public university of China. Thirdly, the research of Kundu and Datta (2015) studied the relationship between trust, e-service quality (e-SQ) and customer satisfaction in the context of internet banking. Seven factors were selected for this study to determine the antecedents of satisfaction and loyalty of undergraduate students on the Gocheck system. The conceptual framework is proposed in Figure 1.
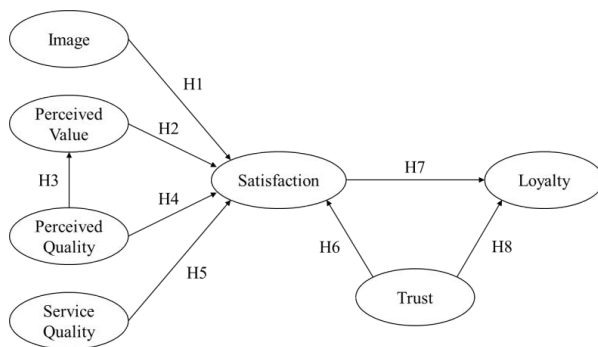

Figure 1 Conceptual Framework

Research Methodology

The research was conducted by using the quantitative approach in data collection and analysis. Questionnaire was applied as a survey tool for data collection, which was distributed online and offline paper-based to the target group of undergraduate students. Measurement items were adopted from previous research literature and the researcher has conducted content validation to ensure internal consistency by using Item–Objective Congruence (IOC) and pilot test of Cronbach's Alpha. The questionnaire consisted of three parts. The first part was screening questions to sort the characteristics of respondents according to the research target group. Second part was measurement items by using five-point Likert scale from strongly disagree (1) to strongly agree (5) to measure each variable item.

Last part was questions on demographic profile of the respondents. Questionnaires were distributed and completed at 500 samples. The collected data was then analyzed using Statistical Package for the Social Science (SPSS) and AMOS for confirmatory factor analysis (CFA) to test the construct validity and fitness of measurement model and structural equation model (SEM) to test fitness of structural model and research hypotheses proposed.

1. Population and Sample Size

The population of this research was focused on undergraduate students who were currently experiencing Gocheck system. Undergraduate students at Yunnan Normal University, China were selected for the population as the university is currently using Gocheck for academic misconduct detection in their three main majors. Hair, Celsi, Oritinau, and Bush (2013) suggested that that the minimum sample size for the study should be 500. Further, sample size calculated from A-priori Sample Size Calculator for Structural Equation Models (Soper, 2006) recommended the minimum sample size of 425 from the parameter of 7 latent variables, 20 observed variables and probability level at 0.05. Therefore, the author decided to collect 500 samples from undergraduate students in Yunnan Normal University for the representative statistical result.

2. Sampling Technique

The researcher used multistage sampling of purposive or judgmental sampling, stratified sampling, and convenience sampling methods. As the population size is large with more than eight million users of Gocheck and the complete list of the target population cannot be compiled, two or more stages of samplings were used to reach target respondents (Shimizu, 2005). At the first stage, judgmental sampling was used to select target population of three majors at Yunnan Normal University as these departments are currently utilizing Gocheck system for their academic misconduct detection. For the second stage, stratified sampling was used to divide sample unit into three majors and proportionately allocate sample size to each unit to ensure the representative of population. As shown in Table 1, the sample size of 500 were allocated to each major, the total numbers of students from three majors totaled 7,906. At the last stage, convenience sampling was used to distribute questionnaires to target respondents of undergraduate students who were experiencing Gocheck system. Questionnaires were distributed during October 2021 via online and offline at the university's departments

to undergraduate students who were willing to participate. The questionnaires were completed and valid for analysis at 500 sets.

Table 1 Population and Sample Size

Subjects using Gocheck System	Population Size of Undergraduate Students	Sample Size
Primary education	3,340	211
Mathematics and Applied Mathematics	2,534	160
Biological sciences	2,032	129
Total	**7,906**	**500**

Source: Yunnan Normal University (2021)

3. Preliminary Data Analysis

Prior to distribution of questionnaires, validation of variable items in the questionnaire was conducted to confirm the consistency and reliability of items (Zikmund, 2000). The researcher employed Index of Item–Objective Congruence (IOC) testing with three experts and pilot test of Cronbach's Alpha with 30 participants with characteristics similar to target population to validate the content. The results were acceptable with item indices higher than 0.5 (Turner & Carlson, 2003) and Cronbach's alpha values higher than 0.7 (Nunnally, 1978). Furthermore, normality of data was tested with data collection to ensure identification of data errors and outliers before running Structural Equation Modeling (SEM) testing. Skewness and kurtosis methods were used to verify normality of data and the results confirmed the acceptable normal distribution of data at values ranging from -2 to +2 (Hair, Anderson, Tatham, & Black, 1998).

Result

1. Demographic Information

The questionnaires were distributed and completed by respondents at 500 sets. The demographic profile of respondents showed that females were the majority at 67.6 percent (338), and males at 32.4 percent (162). Respondents were aged at 18 to 25 years old for 94.4 percent (472), 26 to 33 years old for 5.6 percent (28), and none of the respondents were aged above 33 years old.

2. Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) was conducted in this study to affirm fitness of measurement model, convergent validity, and discriminant validity. Convergent validity for this study was affirmed from the measurement of Cronbach's alpha reliability exceeding

the cut-off point of 0.7 (Nunnally, 1978), Composite Reliability (CR) exceeding the cut-off point of 0.7 (Hair, Black, Babin, Anderson, & Tatham, 2006), Average Variance Extracted (AVE) and factor loading exceeding the cut-off point of 0.5 (Fornell & Larcker, 1981). The results for convergent validity are presented in Table 2.

Table 2 Confirmatory Factor Analysis Result, Composite Reliability (CR) and Average Variance Extracted (AVE)

Variable	Source of Questionnaire (Measurement Indicator)	No. of Item	Cron-bach's Alpha	Factor Loading	CR	AVE
Image (I)	Michael et al. (2013)	3	0.867	0.774-0.867	0.872	0.694
Perceived Value (PV)	Chatterjee et al. (2018)	3	0.830	0.749-0.810	0.831	0.621
Perceived Quality (PQ)	Gonçalves et al. (2020)	3	0.814	0.734-0.769	0.800	0.572
Service Quality (SQ)	Özkan et al. (2020)	3	0.765	0.596-0.789	0.769	0.530
Trust (T)	Levy and Hino (2016)	3	0.781	0.617-0.797	0.783	0.549
Satisfaction (SA)	Dehghan, Dugger, Dobrzykowski, and Balazs (2014)	2	0.723	0.655-0.864	0.737	0.588
Loyalty (LOA)	Martínez (2015)	3	0.860	0.784-0.875	0.880	0.710

Note: Composite Reliability (CR); and Average Variance Extracted (AVE)

Discriminant validity was affirmed by using Fornell-Lacker criterion to compare the square root of average variance extracted with the inter-construct co-efficient. The results in Table 3 showed that the square root of average variance extracted from all items exceeded its inter-construct, therefore discriminant validity was guaranteed (Fornell & Larcker, 1981).

Table 3 Discriminant Validity

	I	PV	PQ	SQ	T	SA	LOA
I	**0.833**						
PV	0.727	**0.788**					
PQ	0.657	0.635	**0.756**				
SQ	0.613	0.610	0.694	**0.728**			
T	0.597	0.628	0.690	0.720	**0.740**		
SA	0.650	0.682	0.682	0.638	0.708	**0.767**	
LOA	0.634	0.724	0.648	0.669	0.700	0.765	**0.842**

Note: The diagonally listed value is the AVE square roots of the variables.

Furthermore, fitness of measurement model was assessed by using goodness of fit indices. CMIN/df, GFI, AGFI, CFI, TLI, NFI, and RMSEA indices were used as indicators for model fit in CFA testing. The statistical values presented in Table 4 were at the acceptable range of CMIN/df=3.853, GFI=0.910, AGFI=0.861, CFI=0.945, TLI=0.924, NFI=0.928, and RMSEA=0.076. Hence fitness of measurement model was proven.

Table 4 Goodness of Fit

Index	Acceptable Values	Measurement Model	Structural Model
CMIN/df	< 5.0 (Al-Mamary & Shamsuddin, 2015)	3.853	3.830
GFI	≥ 0.85 (Sica & Ghisi, 2007)	0.910	0.909
AGFI	≥ 0.80 (Sica & Ghisi, 2007)	0.861	0.863
CFI	> 0.90 (Hair et al., 2006)	0.945	0.944
TLI	> 0.90 (Hair et al., 2006)	0.924	0.924
NFI	> 0.90 (Hair et al., 2006)	0.928	0.926
RMSEA	< 0.08 (Pedroso et al., 2006)	0.076	0.075

Note: CMIN/DF = The ratio of the chi-square value to degree of freedom, GFI = Goodness-of-fit index, AGFI = Adjusted goodness-of-fit index, NFI = Normed fit index, CFI = Comparative fit index, TLI = Tucker-Lewis index, and RMSEA = Root mean square error of approximation.

3. Structural Equation Model (SEM)

Muijs (2004) has defined structural equation modeling (SEM) as an extension of multiple regression. Steenkamp and Baumgartner (2000) stated that SEM as a very useful research tool for theoretical testing. The goodness of fit indices used for measuring fitness of structural model is demonstrated in Table 4. The calculation resulted in CMIN/df=3.830, GFI=0.909, AGFI=0.863, CFI=0.944, TLI=0.924, NFI=0.926, and RMSEA=0.077, showing the statistical values were in the acceptable range.

4. Research Hypothesis Testing Result

The significance of relationship between variables in the research model is calculated from its regression weights and R2 variances at standardized path coefficient (β) and t-value. The hypotheses were supported at p<0.05 and t>1.96. The summary of hypothesis testing results are shown in Table 5 and reveal that the significance affect was confirmed for H2, H3, H6, and H7 and were supported, whereas H1, H4, H5, and H8 were found as insignificant and the testing results were not supported. Loyalty has sole direct affect from satisfaction, while other independent variables of trust, perceived value, image, perceived quality, and service quality were contributed indirectly on loyalty through satisfaction. The variation of loyalty in Gocheck can be explained by all independent variables at 65.7%. Perceived value hada direct influence on satisfaction towards Gocheck, while image, perceived quality, and service had indirect influence. The variation of satisfaction can be explained by independent variables at 56.1%. Perceived value of the respondents was significantly affected by the perceived quality and its variation can be explained at 65.2%.

Table 5 Hypothesis Result of the Structural Model

Hypothesis	Path	Standardized path coefficients (β)	S.E.	t-value	Test result
H1	Image => Satisfaction	0.112	0.062	1.287	Not Supported
H2	Perceived Value => Satisfaction	0.556	0.075	6.442*	Supported
H3	Perceived Quality => Perceived Value	0.923	0.053	15.397*	Supported
H4	Perceived Quality => Satisfaction	0.559	0.131	0.267	Not Supported
H5	Service Quality => Satisfaction	-0.308	0.246	-1.351	Not Supported
H6	Trust => Satisfaction	0.639	0.203	3.340*	Supported
H7	Satisfaction => Loyalty	0.904	0.137	8.907*	Supported
H8	Trust => Loyalty	0.602	0.129	0.272	Not Supported

Note: *p<0.05
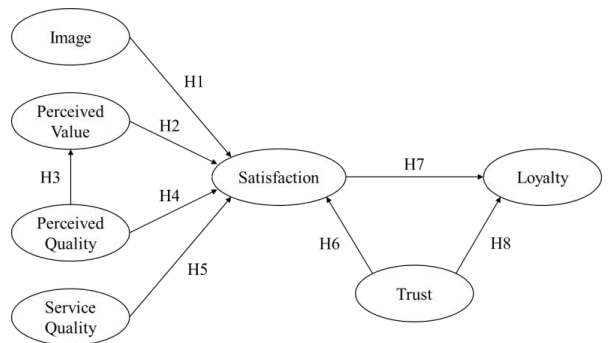
Figure 2 The Results of Structural Model
Note: Solid line reports the Standardized Coefficient with * as p<0.05, and t-value in Parentheses; Dash line reports Not Significant.

The result from Table 5 and Figure 2 can be refined as follows:

H1, there was lack of significant impact of image on satisfaction as the standardized path coefficients was at 0.112 and t-value at 1.287. Undergraduates viewed the company or brand image of Gocheck system did not relate to their satisfaction in usage. The finding contrasted with previous literature studies of Chang and Yeh (2017), Elsäßer and Wirtz (2017) and Jeong and Kim (2020), however supported with the study of Singh et al. (2021). It can be explained that brand building activities of Gocheck developers may be insufficient or ineffective to build positive perception towards the brand or intended brand positioning in the minds of the students. Their experience from using may not match with their expectation, hence irrelevant to their satisfaction.

H2, the significant impact of perceived value on satisfaction was confirmed with the standardized path coefficients at 0.556 and t-value at 6.442. The benefits

gained from using the system either time, price, effort, and convenience significantly contributed to the students' satisfaction. The finding was consistent with the studies of Chatterjee et al. (2018), Gallarza et al. (2016), Kim and Park (2017), and Rasoolimanesh et al. (2016).

H3, the hypothesis was supported that perceived quality significantly impact perceived value with the standardized path coefficients at 0.923 and t-value at 15.397. This implies that the quality of Gocheck system, for instance, performance quality, responding time, technical support, mainly drives the value of the product, which later forms students' satisfaction in the Gocheck system. This finding was aligned with previous research of García-Fernández et al. (2018), Gonçalves et al. (2020), and Russo et al. (2019).

H4, perceived quality does not have a direct significant impact on satisfaction from the standardized path coefficients at 0.559 and t-value at 0.267, but instead has a indirect impact on satisfaction through perceived value. The features and attributes of the product does not directly lead to satisfaction, but instead it enhances the product value perceived by the students. It was considered as the total benefits gained from using the system. This indirect impact on satisfaction was consistency with papers of Kasiri, et al. (2017), Murfield et al. (2017), Samudro et al. (2020), and Suhartanto et al. (2020).

H5, there is no significant impact of service quality on satisfaction from the standardized path coefficients at -0.308 and t-value at -1.351. The finding was contradicted with the literature studies from Foroudi et al. (2018), Paiz et al. (2020), and Vo et al. (2020) that indicates the significant relationship between service quality and satisfaction. This can imply that the service quality provided to end users or students were not recognized or superior that could enable users to have a positive impression and opinions toward the system, for instance, the system's responsiveness and user friendliness.

H6, trust has significant impact on satisfaction with the standardized path coefficients at 0.639 and t-value at 3.340. When the students believe in the security and reliability of the system, they tend to have favorable experience from using that leads to satisfaction. The finding was supported by Agarwal and Narayana (2020), Balaji et al. (2016), Bricci et al. (2016), and Wahyoedi (2017). Trust was the strongest direct predictor of satisfaction, followed by perceived value.

H7, the result supported the hypothesis that satisfaction has significant impact on loyalty with the

standardized path coefficients at 0.904 and t-value at 8.907. This can conclude that if using Gocheck system can satisfy the needs of the students, they are likely to have a long-term commitment or continuous usage. The significant impact was consistent with prior studies by Ghorbanzadeh (2021), Jahan et al. (2019), Kotler et al. (2017), and Song et al., (2019).

Lastly H8, loyalty was not found to be impacted by trust with the standardized path coefficients at 0.602 and t-value at 0.129, which conflicts with the research of Chang and Hung (2018), Esterik-Plasmeijer and Raaij (2017), and Levy an Hino (2016). This lack of relationship was instead aligned with the research of Tabrani, Amin, and Nizam (2018). It can be explained that the students' belief or trust in the system does not directly encourage continuous or long-term usage, but rather stimulate their satisfaction.

Discussion

This paper focused on examining the significant factor impacting undergraduate students' satisfaction and loyalty in Gocheck system in high education of Yunnan, China. Eight research hypotheses were proposed based on conceptual framework developed from previous literature studies. The conceptual framework examined the significant impact of image, perceived value, perceived quality, service quality and trust on satisfaction and loyalty. Questionnaire was used as a tool for data collection at 500 samples from the target respondents of undergraduate students who were currently experiencing Gocheck system and studying in the selected three main majors at Yunnan Normal University, China. Questionnaires consisted of screening question to filter respondents to target group, a five-point Likert scale for measuring variable items, and demographic profile questions. The collected data was analyzed using confirmatory factor analysis (CFA) to test the construct validity and fitness of measurement model and using structural equation model (SEM) to test fitness of structural model and research hypotheses proposed. The results from such analysis would determine the significant factors impacting satisfaction and loyalty in order to satisfy the research objectives.

Perceived value (H2) and trust (H6) had a significant impact on satisfaction of undergraduate students towards Gocheck system, whereas image (H1), perceived quality (H4), and service quality (H5) were insignificant and had the least impact on satisfaction. Subsequently, satisfaction in Gocheck system had a

significant impact on loyalty of undergraduate students, while trust was insignificantly impacted. As a result, the research hypothesis testing showed that four out of eight hypotheses were supported with empirical data.

Loyalty was impacted only from satisfaction, in which the significant antecedents of satisfaction were trust and perceived value. The perceived value was impacted by perceived quality. This finding has strengthened the marketing theory and practices that loyalty is the vital factor to maintain the long-term business-to-customer relationships, which the formulation of loyalty would include the emphasize on its antecedents (Sirdeshmukh, Singh, & Sabol, 2002). Also, the findings partially support the extended model of European Customer Satisfaction Index (ECSI) which grounded the research framework that loyalty can only be significantly explained by satisfaction and its antecedents of perceived value and perceived quality (Vilares & Coelho, 2004). Image has been presumed to have significant relationship with satisfaction under ECSI but was not consistent with this research findings, which may be due to the fact that corporate image, brand building activities, or positioning of Gocheck system was not known or persistent in the mind of students that enable their satisfaction when using. Also, trust was a factor that extended ECSI model to provide wider insights of loyalty (Ball et al., 2004). However, this research found lack of significant relationship between trust and loyalty, it instead stimulates the students' satisfaction. For the relationship between service quality and trust on satisfaction it also partiality supported the model of e-service quality (e-SQUAL) models developed by Parasuraman, Zeithaml, and Malhotra (2005) that trust positively relates to satisfaction, whereas service quality does not relate to satisfaction. This can entail that the service quality such as efficiency, responsiveness, privacy, or customer service were not recognized or superior for the students to earn their positive impression and satisfaction.

The findings have revealed that undergraduate students' satisfaction is the strongest predictor of loyalty in Gocheck system. This can help the higher education institutions, lecturers and citation detection system developer to understand the determinants of undergraduates' satisfaction and loyalty on citation detection system or Gocheck in this study and adopted to their implementations. The important factors that higher education institutions, lecturers and citation detection system developer should emphasize in order

to build users' satisfaction were their perception on product's value and its quality. These important factors should be emphasized for sustaining long-term relationship or loyalty, however for other insignificant factors, the system developers or higher education institutions can research the gap for their improvement and students' recognition. For instance, their brand engagement to build corporate image, and service quality that the product has offered. In terms of perceived value and perceived quality that contributes to satisfaction, the product attributes, features, and benefits gained from using Gocheck system should be ensured, and consistency promoted by system developers or higher education institutions. Also, as perceived value and perceived quality are students' opinion gained after experiencing the system, the system developer can improve the features and functionalities that enhances direct experience when using. By sustaining students' continuance usage or loyalty in Gocheck system, the institutions and lecturers can improve the efficiency in scholarly work review and uphold the academic integrity and transparency.

Suggestion

The research findings have discovered key factors that impact undergraduate students' satisfaction and loyalty of the Gocheck system, which are perceived value, perceived quality, and trust. Trust is the most influential factor on satisfaction of undergraduate students. therefore, the system developer should ensure that Gocheck system is reliable, consistency and able to fulfil its promise. These can be demonstrated through the performance of the system. Its consistent accuracy of citation detection, reliable source of data comparison, and secure data privacy on the papers reviewed. The second influential factor on satisfaction is perceived value. Perceived value is the students' perception on the net benefits gained from using the system, including the product quality such as system performance, features, and functionalities. Hence, the advantages of Gocheck system should be well explained and understood by the students, not only the advantages of that the institutions would receive, but also on their own scholarly works such as building awareness of academic ethics and prevent any intentional or unintentional academic misconduct. Higher education institutions, lecturers, and system developer should not only focus on the implementation of these significant factors, communications and trainings are also vital to ensure

the key messages are delivered to the users or in this context undergraduate students. The key messages of trustworthy, valuable, and qualitied system can be embedded in the trainings of Gocheck system instruction and during the lecture class. These implementation and communications can result to continuance usage and loyalty in the Gocheck system. Apart from the significant driver of trust, perceived value, and perceived quality, the researcher would like to suggest higher education institutions, lecturers, and system developer to investigate the irrelevant factors of image and service quality. Their operational and marketing strategies may not be effective enough to be recognized in these aspects, therefore with improvement, the antecedents of satisfaction and loyalty can be widened.

Limitation and Further Study

The limitation of this study lies in the fact that the population and sample are specifically undergraduates of three majors in a university in Yunnan, China. Different analysis results may vary when looking at different schools, majors, or countries. Also, the citation detection system was solely focused on the Gocheck system, whereas the study with other branded system may offer different insights due to its range of services offered, system functionalities, and technical services. Further, the research framework can be integrated with other research theories to explore other determinants for extensive insights such as the DeLone and McLean successful models to determine attributes of information system quality that may have an impact to perceived value, satisfaction, or loyalty of the users.

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