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THE RELATIONSHIP BETWEEN ONLINE TEACHER-STUDENT INTERACTION AND ONLINE ACADEMIC PERFORMANCE: THE MEDIATING EFFECT OF ACADEMIC OPTIMISM

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ABSTRACT
The development of technology promotes the wide use of online classroom which enables people to have more flexible and diverse way to acquire knowledge. As a result, the educational resources are shared and educational equity is promoted. However, many studies reveal that there are some disadvantages of online classroom, such as high dropout rate, difficulty in learning process evaluation and low satisfaction with courses. Consequently, the performance of online learning is not satisfactory. Therefore, it is urgent to explore the factors affecting the performance of online learning. This study uses Bandura's reciprocal determinism theory. With a questionnaire survey, this study collected data from 500 university students of five public universities in Henan province of China, to explore the following research objectives: whether there is a positive correlation between teacher-student interaction and online academic performance; whether there is a positive correlation between teacher-student interaction and academic optimism; whether there is a positive correlation between academic optimism and online academic performance; whether academic optimism plays a mediating role between online teacher-student interaction and online academic performance. The results show that: (1) The average scores of academic optimisms are of medium level; (2) There are significant positive correlations between each pair of online teacher-student interaction, academic optimism and academic performance; (3) academic optimism plays a mediating role between online teacher-student interaction and academic performance, which can explain 10% of the relationship between online teacher-student interaction and academic performance. Research shows that academic optimism has an important impact on university students, and positive psychology knowledge should be imparted to university students to help them establish correct learning values.

Keywords:
academic optimism; teacher-student interaction; online academic performance; reciprocal

INTRODUCTION

With the rapid development of information technology such as mobile internet, teaching and learning begin to break through the limitations of time, space and location, and knowledge acquisition channels become more flexible and diverse. This large-scale and open online classroom education form is spreading rapidly all over the world, and has great significance in realizing the sharing of educational resources and promoting educational equity (Yong, 2008). However, many studies have shown that there are many problems in online classes at home and abroad, such as high dropout rate, difficulty in learning process evaluation, and low satisfaction with courses (Jie, Ming & Hao, 2012). In view of the online learning, the subjective and objective performance of individual learning satisfaction and academic performance are collectively called online academic performance (Bin, 2014; Bin, En & Jing, 2013). Therefore, it is inferred that overall, learners' online academic performance is poor, and the quality of online classroom education is low. Considering the far-reaching impact of online classroom on education, it is of great practical significance to explore the factors affecting the performance of online learning.

There are many factors affecting the performance of online learning, including not only individual factors such as low learning motivation, but also social factors such as low interaction level (Hew & Cheung, 2014). Although previous studies have also explored online learning from a single or juxtaposed perspective, most of them focus on the social level--the social factors in the learning

environment (Bryant & Bates, 2015; Toven-Lindsey, Rhoads, & Lozano, 2015) or the individual level--Individual psychology of learners (Yun, 2015). This study explores how variables at the external social level influence online academic performance through individual internal psychological variables from the perspective of intermediary relationship between variables.

THEORETICAL FRAMEWORK

In the 1960s, based on Lewin's model, Bandura put forward the theory of reciprocal determinism. Bandura pointed out that behavior, person and environment actually act as the determinants of mutual connection and interaction. Bandura defined the concept of reciprocal as the interaction between things, and determinism as the product of the influence of things (Bandura, 1986).

Bandura refuted the behaviorist's environmental determinism which he believes is a one-way determinism and should be replaced by reciprocal determinism (Bandura, 1986). According to Bandura, environment determines human behavior, and human behavior also determines environment. The environment shapes a person's cognitive structure, such as beliefs and expectations while at the same time people's cognitive structure (belief and expectation) will determine a person's behavior, and people's behavior changes the environment. In this process, the three elements, namely, environment, person and behavior have impact on one another.

The online classroom learning can be viewed from the perspective of Bandura's reciprocal determinism. Behavior, in the online classroom, refers to the learning activities of learners through the online environment; personal factors, that is, learners, also includes the cognitive structure, personality, physiological characteristics, psychological structure, age, etc.; environment, that is, the online learning environment, including computers, learning interface, learning platform, learning resource base, etc. In the interaction of online classroom, these three parties work together and a complete and effective form of online classroom interaction doesn't exist if any of the three parties is missing. That's the reason Bandura's reciprocal determinism is applied to underpin this study.

LITERATURE REVIEW

This study mainly explores the impact of teacher-student interaction and academic optimism on online academic performance. In this study, online teacher-student interaction refers to the quality of communication and interaction between learners and teachers in the process of online learning. According to Bandura's reciprocal determinism (Bandura, 1986), online teacher-student interaction, as a concrete manifestation of social interaction in learning, is an important environmental factor affecting online academic performance. Studies based on online classroom have also found that the lack of teacher-student interaction may be the main reason for the low performance of learners in online learning (Hu, 2020). However, previous studies on online interaction have found that the more social interaction, the more active learning experience learners have, the better their academic performance. However, they regard teacher-student interaction and student-student interaction (interaction between learners) as a whole and do not explore the relationship between online teacher-student interaction and academic performance or learning experience (Martin & Bolliger, 2018). There are some researchers consider the impact of teacher-student interaction on online academic performance, but it is hard to judge whether it is in a system-based learning environment because the learning background is not clearly stated (Xu, 2020). Based on this, this study examines the relationship between teacher-student interaction and online academic performance in a systematic online classroom environment, and assumes that there is a significant positive correlation between teacher-student interaction and online academic performance in online classroom (hypothesis 1).

The reason for choosing academic optimism as another independent variable is that the conceptual connotation of academic optimism belongs to the important category of positive psychology research, and high degree of academic optimism can be regarded as positive personality. Optimism is a typical positive personality trait and Luthans (2002) believes that optimism is a measured and exploited positive force and quality, a positive psychological ability, an important psychological capital of an individual, and a cultural mechanism to promote human evolution. The concept of academic optimism comes from the projection of individual optimism traits to learning and academic optimism is the concrete representation of optimistic mental state in learning. Some scholars define academic optimism as academic optimism and it is an individual's positive, optimistic and open-minded attitude experience towards learning life, which means that the individual always expects and believes that good results can occur in the learning process and can make a good adaptation and positive explanation for the adverse consequences (Li, 2020). Individuals with high academic optimism have more positive attitudes towards their own learning (Dong, 2018). Accordingly, this study proposes the hypothesis H2: academic optimism positively predicts university students' online academic performance (hypothesis 2).

In recent years, quantitative research in social sciences has emphasized that studies should not only on the direct correlation between two variables, but also should look into the deep-seated mechanism of variable correlation, that is, to find the mediating variable between two related variables (Dong, 2018). In other words, it is necessary to study whether there exists mediating variables between teacher-student interaction and online academic achievement (Dong, 2018). It can be inferred that university students with high academic optimism tend to have good learning mood and frustration tolerance, so they are more likely to achieve good academic performance. However, teacher-student interaction can help to regulate self-mood and attitude, and help students improve their expectations of learning. Therefore, this study proposes the hypothesis H3: Online teacher-student interaction can positively predict academic optimism (hypothesis 3).

According to the above analysis, online teacher-student interaction can predict students' academic optimism and online academic performance, while students' academic optimism can also predict students' online academic performance positively. The three variables are interrelated, that is, online teacher-student interaction can not only directly affect the academic performance of university students, but also affect the academic performance of university students through the mediating role of academic optimism. Based on this, this study proposes hypothesis H4: academic optimism plays an important part in mediating the interaction between online teachers and students and university students' online academic performance. That is, online teacher-student interaction can not only directly affect university students' academic performance, but also indirectly affect university students' academic performance through academic optimism.

RESEARCH OBJECTIVES

This study reveals the influence mechanism of online teacher-student interaction on online academic performance from the perspective of academic optimism, and at the same time provides help for the effective development of university Students' online learning. The study has four research objectives: (1) to find out whether there is a positive correlation between teacher-student interaction and online academic performance; (2) to find out whether there is a positive correlation between teacher-student interaction and academic optimism; (3) to find out whether there is a positive correlation between academic optimism and online academic performance; (4) to determine whether academic optimism plays a mediating role between online teacher-student interaction and online academic performance.

METHODOLOGY

Population and Sampling

Based on the population in this study and the Table for Determining Sample Size from a Given Population made by Krejcie and Morgan (1970), the calculation of the sample size in this study is: s = X2NP(1 - P) / CP(N - 1) + X2P(1 - P), and the result is s=353. Therefore, the sample size in this study is 353.

By using stratified sampling method, five public universities in Henan Province were chosen and then, taking questionnaire recovery rate into consideration, more questionnaires should be distributed than the number calculated above, so 450 questionnaires were distributed in four grades of the five universities by using the simple random sampling. At last, 392 valid questionnaires were collected, with a questionnaire recovery rate of 87.1%. Among the respondents of the 392 valid questionnaires, according to the nature of the online courses they participated, the courses can be divided into social sciences and natural sciences.

INSTRUMENTS

Teacher-student Interaction Questionnaire for Online Learning

In this study, the Teacher-student Interaction Questionnaire for Online Learning compiled by Jia Bin (2014) is adopted. The questionnaire evaluates the degree of teacher-student interaction perceived by learners in the process of online learning from seven aspects: interaction mode, interaction frequency, interaction emotion, interaction content, interaction depth, interaction time and interaction motivation. There are 21 questions in the questionnaire. Five-Point Likert Scale is used for self-assessment (1=totally inconsistent, 5=totally consistent). The higher the score, the more intensive the interaction between teachers and students will be. In this study, the consistency coefficient of the scale Coronhach'α was 0.93.

Youth Optimism Questionnaire

This study also adopts the Youth Optimism Questionnaire compiled by Professor Yu Xinxin (2012), which includes 26 items, with five dimensions: positive attitude towards life, positive attitude towards problems encountered, acceptance of reality, positive expectation and open mindedness. The internal consistency reliability coefficient of the total questionnaire is 0.916, and the retest reliability coefficient is 0.798; the internal consistency reliability coefficient of each dimension is between 0.701 and 0.797; the retest reliability coefficient is between 0.602 and 0.687, and all of them reach the significant level of 0.01. The scale is scored by Five-Point Likert Scale (1=totally inconsistent, 5=totally consistent).

Online Academic Performance

The Online Academic Performance complied by Jia Bin (2014) is adopted in this study. The questionnaire mainly measures learners' subjective and objective learning effects in online learning from five dimensions: learning satisfaction, ability and social interaction, academic achievement, personal knowledge and input-output ratio. The questionnaire contains 19 questions and Five-Point Likert Scale is used (1= completely inconsistent, 5=fully consistent). The higher the score is, the better the learners' learning effect in online learning will be. In this study, Coronhach'α of this questionnaire is 0.89.

RESULTS

This study mainly uses quantitative analysis methods. Specifically, in addition to the descriptive statistical analysis method using SPSS, CFA is carried out by using AMOS 20.0, and the items with poor reliability and validity are removed from the original questionnaire, and the observed variables of two latent variables, teacher-student interaction and academic optimism, are determined. Finally, in order to test the hypothesis of this study, the structural model is analyzed by using AMOS 20.0.
The reliability, convergence validity and discriminant validity of the potential variables of teacher-student interaction and academic optimism are tested by using Confirmatory Factor Analysis (CFA). Reliability refers to the stability, and consistency of measurement items. SMC values are used to measure the reliability of each item in the model, and Composite Reliability (CR) is used to measure the internal consistency of each dimension.

The results of the reliability and convergence validity tests of teacher-student interaction and academic optimism are shown in Table 1. The SMC values of all factors are above 0.3, and the CR values are higher than 0.65, which indicate that the measured items have good reliability. In addition, the standard load of all measurement items is above 0.5, and all of them have great significance at the level of 0.001. Meanwhile, the Average Variance Extracted (AVE) of each factor is higher than 0.5, which shows that the measured items have good convergence validity. As for the detection of discriminant validity, the correlation coefficient between AVE and other variables can be compared. If the root value of AVE is higher than the correlation coefficient, it indicates that the model has good discriminant validity.

Table 2 shows the results of the discriminant validity analysis, and the root value of AVE for each variable is higher than the corresponding correlation coefficient of 0.412, so there is a good discriminant validity among the variables.

Table 1 Reliability and Convergence Validity Analysis

		Unstd	S. E.	Z-value	P	Std	SMC	CR	AVE
teacher-student	IN1	1.000				.820	.683	.757	.536
interaction	IN2	.964	.016	53.762	***	.852	.683		
	IN3	.860	.017	49.721	***	.716	.579		
	IN4	.750	.016	45.321	***	.560	.346		
	IN5	.865	.016	53.762	***	.852	.683		
	IN6	.950	.017	49.721	***	.716	.579		
	IN7	.760	.016	45.321	***	.560	.346		
academic optimism	LO1	1.000				.689	.487	.656	.537
	LO2	1.153	.020	52.468	***	.702	.451		
	LO3	1.156	.022	55.364	***	.631	.521		
	LO4	1.135	.020	53.586	***	.545	.412		
	LO5	1.135	.023	55.564	***	.642	.328		

Table 2 Discriminant Validity Analysis

	AVE	academic optimism	teacher-student interaction
academic optimism	.732	.736	
teacher-student interaction	.536	.412	.632

Assuming that university students' academic optimism is the mediating variable between teacher-student interaction and students' academic performance, the academic optimism and teacher-student interaction in this study is the latent variable, and the academic performance of university students is the explicit variable. The mediating effect of academic optimism needs to be tested through structural equation model. According to the requirement of structural equation modeling, two latent variables have been validated and analyzed and four items are determined respectively to measure academic optimism and teacher-student interaction. The explicit variable academic performance is represented by the students' academic ranking in the class. A structural equation model consisting of three variables is established to test the relationship among teacher-student interaction, academic performance and academic optimism.

Variance maximum likelihood method is used to estimate the parameters of structural equation model, and a series of fitting indices are obtained, as shown in Table 3.

Table 3 Overall Test of Mediation Model

Model	GFI	AGFI	RMSEA	CFI	TLI
M	. 935	. 968	. 076	.955	. 937

According to the standards of good fit, RMSEA should be less than 0.08, AGFI, TLI, CFI, GFI should be higher than 0.90. As shown in Table 3, RMSEA is 0.076, and GFI, AGFI, CFI and TLI are all higher than 0.9, which indicate that the model fits well. Then the Bootstrap test is used to get the total, indirect and direct effect of each path. The point estimation, Z values and confidence intervals of the three effects are shown in Table 4.

Table 4 Effect Decomposition of Academic Optimism Mediation Model

Variable	Point Estimate	Product of Coefficients		Bootstrapping Bias—Corrected 95% CI		Percentile 95% CI	
		SE	P	Lower	Upper	Lower	Upper
Total Effects							
Self-efficacy Academic performance	.410	.013	< 0. 001 .	.312	.412	.342	.378
Indirect Effects							
Self-efficacy Academic performance	.041	.011	< 0. 001 .	.042	.061	.031	.032
Direct Effects							
Self-efficacy Academic performance	.352	.010	< 0. 001 .	.215	.351	.311	.310

It can be seen from Table 4 that when academic optimism is not included as a mediator variable, the predictive effect of independent variables on dependent variables, that is, the total effect of teacher-student interaction on university students' academic performance is 0.410, $P < 0.001$, so hypothesis H1 is confirmed. The normalized correlation coefficient of mediator variable academic optimism to independent variable teacher-student interaction is 0.378, $P < 0.001$, so it can be concluded that the research hypothesis H2 has been confirmed, which meets the conditions of mediation effect test. The effect of teacher-student interaction on academic performance is 0.352, $P < 0.001$, and the effect is also significant when academic optimism is included as an intermediary variable. This indicates that university students' academic optimism partially mediates academic performance, and the research hypothesis H3 is confirmed. The size of the mediation effect is 0.041, accounting for 10% of the total variation. That is to say, the mediation effect of academic optimism can explain 10% of the relationship between teacher-student interaction and academic performance.

CONCLUSION AND DISCUSSION

Based on the above analysis, it can be concluded that there are significant positive correlations between each pair of online teacher-student interaction, academic optimism and academic performance. Some of the findings are in accordance with the previous studies. In terms of the relationship between online teacher-student interaction and academic performance, Chaoxi (2017) found that online teacher-student interaction could improve the academic performance of students in vocational colleges. Junjie (2016) found that online teacher-student interaction could enhance the academic performance of English major students in Comprehensive English class. As for the positive correlation between academic optimism and academic performance, Hoy (2006) found that school academic optimism had a positive predictive effect on students' academic performance. Yanning, and Jinhua (2014) found that the optimistic personality of vocational college students was closely related to learning motivation and academic achievement. High optimism could predict learning motivation and academic achievement.

These studies are in accordance with the findings of this research. However, this study is different from previous studies in two aspects: firstly, the subjects of this study are different from the previous researches as in this study university students attending both social and natural science online classes are surveyed; secondly, this study finds that online teacher-student interaction can not only directly affect students' academic performance, but also indirectly affects the academic performance of university students through the mediating effect of academic optimism, that is, academic optimism partially mediates between teacher-student interaction and academic performance, which is an important finding of this study.

Besides, the findings of this study support Bandura's reciprocal determinism theory by founding out that there are significant positive correlations between each pair of online teacher-student interaction, academic optimism and academic performance, which are environment, person and behavior respectively in Bandura's reciprocal determinism theory.

In fact, in addition to the impact on academic performance, it is undoubtedly beneficial for university students to maintain an optimistic attitude towards their studies and maintain a healthy psychological state. So, in the practice of education, as administrators and teachers of universities, how do they improve students' academic optimism?

Firstly, more positive psychology knowledge and positive experience should be imparted to university students. Positive psychology researchers believe that positive personality development and emotional experience are very important for the healthy growth of individuals. In the past, university students' mental health education was mostly about preventing negative mental diseases. Focuses are always on the students who showed unhealthy mental state. Now, positive psychology knowledge needs to be imparted to university students to help them acquire strategies for cultivating

positive personality, and create positive emotional experiences such as success, happiness and belonging, so that their positive psychological state may flourish, and they are capable of coping with the difficulties encountered in learning more calmly. For university students who are facing difficulties in their studies, their learning conditions can not only be improved through additional guidance from teachers and help from classmates, but also by creating positive experiences and encouraging them to actively participate in extracurricular activities such as sports activities, literary and artistic activities besides learning, so them may get the positive experience of extracurricular activities, and eliminate the impact of negative emotions through the increase of positive emotions.
Secondly, the problem can be solved by setting up correct learning values and cultivating strong interest in learning. Compared with basic education, the learning process of higher education requires students' initiative. Under the circumstance of weakened external supervision, it is particularly important for university students to have correct learning values. Learning values are the core concepts of individual learning, which can guide individual's specific learning attitudes and methods. Some scholars pointed out that learning values refer to learners' orientation of learning goals, that is, what is the purpose of learning. If university students only regard learning as external and meaningless, they naturally cannot have a strong interest in learning and serious attitude. Once they encounter some setbacks in learning, they will immediately produce pessimism, abandonment, boredom and other negative emotions. If this negative emotion cannot be eliminated in time, university students will naturally be pessimistic about their future studies, and even full of confusion and anxiety for the whole life. University administrators and teachers, could help university students establish correct learning values through teaching, lectures, after-class discussions and other forms of activities, so that students can turn learning into their own internal needs and feel that learning is interesting and necessary.

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THE DEVELOPMENT OF CHINESE SOVEREIGN DIGITAL CURRENCY BASED ON RCEP

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ABSTRACT

RCEP would conduce to increase the investment and trade dependence of member countries. With the increasingly close economic and trade relations in East Asia, the dependence of East Asian countries on the United States and the European Union would decrease to a certain extent. Meanwhile, it would also affect the status of the U.S. dollar, euro and sterling in Asia. The China Yuan (CNY), by contrast, would be more widespread. This would further accelerate the process of CNY internationalization. Under the RCEP framework and in the context of the global epidemic situation, China needs to integrate the RCEP rules with the "Trinity" strategy to promote the orderly, stable and sustainable development of CNY internationalization. Qualitative content analysis has been used in this article to investigate the implications of the signing of the Regional Comprehensive Economic Partnership (RCEP) for the internationalization of CNY. Furthermore, to explore the development direction of internationalization of CNY in the context of the uncertain international political and economic environment, which is under the RCEP. Considering that sovereign digital currency could improve the effectiveness of monetary policy and supervision capacity, and thus improve the financial risk prevention and control system of regional countries. Consequently, Chinese sovereign digital currency based on blockchain technology could become an effective path for the internationalization of CNY under the RCEP framework.

Keywords:
Regional Comprehensive Economic Partnership (RCEP), Sovereign Digital Currency, Central Bank Digital Currency (CBDC), China Yuan (CNY), Blockchain Technology

INTRODUCTION

After the Great Depression of 1929, the global gold standard was completely wiped out, the United Kingdom completely withdrew from the center stage of the global economy, and the United States replaced it as the center of the Bretton Woods System (Li, 2018). Since then, the United States, with its sound financial system and huge financial markets, has hosted the world's largest foreign exchange, stock and gold markets. At the same time, the dollar in international trade and international foreign exchange reserves and other aspects of a huge scale advantage. Although the Jamaica system does not provide a standard currency, the US dollar still holds a monopoly position in the international financial payment system (Li, 2018). As the era of sovereign credit currency, the currency issuance of each country lacks supervision and restriction. Especially now, in the face of the COVID-19 pandemic, central banks are adopting quantitative easing monetary policies to boost their economies and rescue them. The different monetary systems adopted by different countries bring high costs and complexity between currency exchanges (Zhang et al., 2019). The current complex international political and economic environment promotes the issuance of sovereign digital currency and the reconstruction of international financial payment system.

The Regional Comprehensive Economic Partnership (RCEP) had been formally signed in November 2020 (Shen, 2021). This marks the official birth of the world's largest free trade area, which is dominated by Asian economies. The population, economic aggregate and intra-regional trade of RCEP members account for about 30% of global trade volume, which on the basis of the ten ASEAN countries, plus China, Japan, South Korea, Australia and New Zealand (Shen, 2021). It is the largest free trade area in the world and of great significance to the economic integration of Asia (Shen, 2021).

Several scholars (i.e. Zhang, 2021; Shen, 2021) noted from their studies that as the main export target of southeast Asian economies, China runs a huge economic deficit against the whole of Southeast Asia every year. The RCEP signing marks that China will be the dominant and influential voice in southeast Asia's free trade. With the Belt and Road Initiatives proposed and built earlier, the world's largest free trade zone will break away from the dominance of the United States for the first time. It will be dominated by China, the single largest player of regional economy and market. In the face of a large number of trade settlement demands in the region, China Yuan (CNY) will gradually dominate the whole process. And to reduce the substantial trade costs incurred in the region's international trade as a result of the use of the United States dollar as the intermediary currency. In addition, a large proportion of regional international trade in RECP countries is cash crops such as food and fruit, which has a rigid demand for the speed and convenience of customs clearance and settlement time (Ping & Chen, 2013). Therefore, digital currency and convenient international financial payment system would be the first choice for trade in the region.

Qualitative content analysis was used in this article to investigate the implications of the signing of the Regional Comprehensive Economic Partnership (RCEP) for the internationalization of CNY. Furthermore, this study explored the development direction of internationalization of CNY in the context of the uncertain international political and economic environment, which is under the RCEP. The sovereign digital currency could improve the effectiveness of monetary policy and supervision capacity, and thus improve the financial risk prevention and control system of regional countries. Consequently, this paper explored whether Chinese sovereign digital currency based on blockchain technology could become an effective path for the internationalization of CNY under the RCEP framework.

LITERATURE REVIEW

Blockchain technology is the underlying technology for digital currencies and the supporting technology for issuing them. The existing research provides an exhaustive classification of digital currencies with respect to their different characteristics. Meanwhile, a large number of studies have examined digital currencies in comparison with legal tender. In addition, the legal compensation of the existing digital currency is also discussed.

Non-anchored Private Digital Currency

Liu and Song (2020) noted from their study that digital currency could be divided into three categories: non-anchored private digital currency, digital stablecoin and central bank digital currency (CBDC). The evolution of its functions has experienced three stages: asset, currency and payment network. Non-anchored private digital currency is represented by Bitcoin, also referred to as cryptocurrency, which is defined as a decentralized token that has no issuer or does not represent any underlying asset or institutional liability (Barontini & Holden, 2019). Despite being called money, non-anchored private digital currencies are not recognized as money, but more as assets. Liu and Song (2020) noted that the primary characteristic of such digital currencies is that they are an asset whose value is determined by the relationship of supply and demand. Unlike traditional currencies, non-anchored private digital currencies are not a liability of an individual or institution, nor are they backed by any state, other than the general merchandise, its intrinsic value is zero (Liu & Song, 2020). The value of such digital currency depends only on the belief that it could be exchanged for some commodities/services or a certain amount of sovereign currency. Similarly, Kirkby (2018）define that more like an asset used to speculate rising prices or defend against inflation, such cryptocurrencies could coexist with the existing fiat currency system as a safe haven asset.

Digital Stablecoin and Central Bank Digital Currency

According to Li (2018), with the deepening globalization of international economy and trade, most banks in the world have used SWIFT system for international business settlement. Founded in 1973, Society for Worldwide Interbank Financial Telecommunications (SWIFT) is a non-profit cooperation organization among international banks. The widespread use of its system has enabled international financial settlement business to have a convenient, efficient, safe and reliable standardized communication service system, which has greatly improved the settlement speed of international banks (Li, 2018).

With the rapid development of mobile internet, the internet giant Facebook, which has 2.4 billion social network users worldwide, has launched the Libra Cryptocurrency Project. Visa, Mastercard, Paypal and other large institutions have been involved in the project (Rirsch & Tomanek, 2019). Moreover, few recent scholars (i.e. Hao, 2020; Rirsch & Tomanek, 2019) note that to better promote Libra, it chooses to link deposits or government bonds in a basket of currencies. This is more in line with the popular mindset than cryptocurrencies such as Bitcoin, which have no asset support. In April 2020 Libra project released its version 2.0, defining it as a settlement currency for a "global payment system" to avoid challenging monetary sovereignty. At the same time, the explicit reference to money fund management to deal with the risk of a possible run.

The digital stablecoin is a digital currency designed to maintain a stable value relative to a specific asset pool or basket of assets (Financial Stability Board [FSB], 2020).In recent years, major financial institutions and technology companies have launched digital stablecoin programs, most notably Libra, which was launched by Facebook. Meanwhile, many central banks have noted that digital currencies could enhance the effectiveness of monetary policy and enhance regulatory capacity. Hence the central bank began to work on the development of its digital currency. According to Kiff et al., (2020), a central bank digital currency is a digital representation of a sovereign currency issued by a country's central bank (or other monetary authority) as its liability. Central bank digital currencies could be divided into wholesale and retail categories, the former restricted to banks and other members of the national payment system, and the latter widely available to the public (Kiff et al., 2020). Central bank digital currency has sovereign credit, which is worthy of the name of "currency".

Legal Compensation of Currency

The legal compensation of currency means that the currency recognized by law has legal solvency for a specific range of debts, the currency with legal compensation is called "legal tender" (Ke, 2020). In a few recent studies (i.e. Ke,2020; Pistor, 2013), giving money legal compensation could affect the currency circulation, and giving or prohibiting the negotiability of payment instruments will also affect the implementation of legal compensation. For instance, Bitcoin could be used as a medium of Commodity Exchange in a specific field to some extent, so it has the characteristics of negotiability. Nevertheless, in some countries, Bitcoin is legally prohibited from circulation, so it is not tradable, let alone legal compensation.

Blockchain Technology

Blockchain technology is the underlying technology for digital currencies and the supporting technology for issuing them. Blockchain technology includes hash algorithm, Merkle tree, timestamp service, proof of work mechanism, proof of interest mechanism, P2P network technology, asymmetric encryption technology and other comprehensive technologies, which solves the problem of "decentralization" and "double payment" in the application process of digital currency (He et al., 2017). The application of blockchain technology means that digital currency adopts a distributed security protection system. The transaction parties of digital currency need to be authenticated,

otherwise they cannot be included in the system, which greatly improves the security and legitimacy of digital currency.

According to Bao (2020), blockchain technology provides an efficient public ledger system and credit management database system for the creation of sovereign digital currencies. The development of blockchain technology provides the technical basis for bookkeeping credit and account management for the issuance and circulation of sovereign digital currencies. In fact, blockchain is a distributed ledger system and database system that could be shared by all. Moreover, Bao (2020) states that blockchain technology involves many applied technologies and theoretical disciplines such as modern mathematics, Internet technology, computer technology, cryptography and digital security. With the help of blockchain technology, a global public ledger system of sovereign digital currency and a database system of value circulation could be created.

Since the beginning of the 21st century, contrary to the rapid integration of China's economy into the global market, the United States, under the leadership of the new administration, is rapidly decoupling from the global industrial chain and actively promoting the return of manufacturing to the United States (Zhang & Li, 2021). However, in this era of globalization, the interests of all countries are deeply intertwined. The formation and development of global industrial and supply chains are the result of the joint action of market rules and enterprise choices. The anti-globalization would weaken the political and economic dominance of the United States in the international arena, and further would weaken the international financial trade payment system dominated by the United States based on the dollar unit of account. In the current special political and economic environment, coupled with the COVID-19 pandemic, the international financial payment system is faced with the need and opportunity of institutional reform. As a leading country in RCEP cooperation and the world's second largest economy, China has been promoting the internationalization of the CNY. Considering that sovereign digital currency could improve the effectiveness of monetary policy and supervision capacity, and thus improve the financial risk prevention and control system of regional countries. Based on the articles reviewed, it is reasonable to assert that the distributed payment networks with digital currencies have the potential to reshape the global cross-border payment system, and show some advantages in economic efficiency and market structure. Therefore, the exploration and construction an effective path of the internationalization of CNY under RCEP framework is highly foresight.

RCEP WOULD SPEED UP THE INTERNATIONALIZATION OF CNY

The formation of a large integrated RCEP market has increased the frequency of investment and trade exchanges in the region, and the huge market potential should be tapped and unleashed (Chang, 2020). Meanwhile, such a large trade scale will be conducive to the wider popularity of CNY in the Asia-Pacific region and the process of CNY internationalization. The influence of RCEP on trade in goods, trade in services and industrial chain could promote the recognition of CNY in regional trade. RCEP would facilitate the development of regional trade through tariff-free, thus advancing the process of RMB internationalization. In terms of trade in services, the signing of the RCEP would boost cooperation in tourism and infrastructure projects between countries in the region, which could create a huge demand for financial services. Therefore, RCEP would speed up the internationalization of CNY.

The Regional Comprehensive Economic Partnership (RCEP) would be consistent with the WTO, more than 90 percent of trade in goods in the region will eventually be tariff-free once the agreement takes effect (Regional Comprehensive Economic Partnership [RCEP], 2019). Due to the high proportion of young people in RCEP member countries, China has a great advantage in consumer electronics, smart home, new energy vehicles and other fields (Chander & Sunder, 2018). Tariff-free on trade in goods within the region would promote various brands created by China for young people

to go global. On the other hand, tariff-free to a certain extent lowers the prices of imported high-quality products in Chinese domestic market, such as Japanese cosmeceuticals, Australian skin care products, Honey from New Zealand, durian from Malaysia and other products. The lower prices of these imported products are most beneficial to relevant import trading companies. According to RCEP (2019), along with the implementation of unified rules of origin, technical standards, customs procedures and quarantine uniform rules, the combined effects of the elimination of tariff and non-tariff barriers will gradually release the trade-creating effects of RCEP. It would significantly reduce intra-regional trade costs and product prices, improve the competitiveness of products of the region. In addition, it also benefits enterprises and consumers of all parties, thus promoting the internationalization of CNY.

In terms of trade in services, the signing of the RCEP would lead to more post-epidemic visa-free travel and visa-on-arrival visits, which would promote tourism in China and ASEAN (RCEP, 2019). Inbound tourism to China and other countries in the region would also usher substantial growth simultaneously. With respect to the development of education, RCEP (2020) has mentioned in Annex III of Chapter VIII of the agreement that there would be new opportunities in various kinds of sino-foreign joint education and overseas study business between member countries. RCEP (2020) has made a large number of regulations on intellectual property rights in which mentioned in Chapter XI of the agreement. Thus, China's service exports would increase significantly no matter big data, cloud computing and artificial intelligence projects, or comprehensive projects such as game, short video production, online education and online medical treatment. According to Xie et al. (2019), smart city provides a relatively perfect solution to solve a host of economic, social and environmental problems caused by the rapid urbanization of the world population. Consequently, the market for railways, telecommunications and smart cities across Asia would be huge. Hence there is a huge demand for capital for a lot of infrastructure projects, which will put a big demand on financial services.

RCEP (2019) has declared that the tariff-free and rules of origin would ultimately benefit the entire RCEP member countries in this region. The combination of tariff-free and rules of origin could stabilize the industrial, supply and value chains in the region, thus promoting industrial upgrading. The industrial chain, from research to manufacturing, could produce high value in multiple fields (Bettiol, 2017). For production capacity that is still in low value-added areas, joining RCEP would enable regional countries to carry out production capacity cooperation in multiple fields. The removal of tariff barriers in the RCEP region and the increase of regional trade dependence would promote reshape the industrial chain in East Asia. A more complete industrial chain would bring more space for CNY internationalization. Simultaneously, how to promote the internationalisation of the RMB in an efficient and steady manner under the rcep framework requires exploring the optimal path in the light of the current political and economic environment.

RESEARCH ON THE PATH OF INTERNATIONALIZATION OF CNY UNDER RCEP FRAMEWORK

As an important part of service trade, financial services provide strong support for industrial chain and goods trade. Meanwhile, with the further opening of financial markets among RCEP member countries, risk prevention and control is another major issue that needs to be faced (Li, 2021). Consequently, exploring an effective path for CNY internationalization would be conducive to maintaining the financial security of countries under the RCEP framework and mutual benefits, as well as avoiding potential risks arising from fluctuations in the US dollar exchange rate.

The RCEP Chapter viii on Trade in Services covers all four cross-border classifications of the GENERAL Agreement on Trade in Services (GATS) under the WTO framework (RCEP, 2020). Therefore the RCEP financial Services provisions would facilitate the financial development of

countries in the region in terms of the opening up of products and businesses in insurance and financial markets, as well as the opening of capital markets and the cross-border flow of capital (RCEP, 2020). Capital market and cross-border capital flow include cross-border payment and currency transfer services, foreign exchange business, derivatives business, exchange rate and interest rate instruments, settlement and clearing of financial assets, etc. (Zhao, 2020). They all involve greater openness of money markets, capital markets and easier cross-border capital flows.

With the further opening of financial markets among RCEP member countries, risk prevention and control is another major issue that needs to be faced (Li, 2021). Given the gradient difference in economic development level among RCEP members, regional production capacity cooperation can enhance the stability of regional industrial and supply chains and promote efficient allocation of production factors. At the same time, RCEP members have carried out in-depth cooperation in trade in services, such as telecommunications and finance. However, the global economic and financial development is facing risks and challenges due to the severe impact of COVID-19. In this regard, countries in the region need to improve risk prevention and control systems and closely follow the new trend of cross-border capital flows. Considering the distributed bookkeeping features of the sovereign digital currency, it could enhance the effectiveness of monetary policy and regulatory capacity. Therefore, the sovereign digital currency based on blockchain technology could effectively prevent and defuse financial risks in RCEP member countries.

Li (2021) states that as a leading country in RCEP cooperation and the world's second largest economy, China has been promoting the internationalization of the CNY. This is conducive to the financial security and mutual benefit of all countries under the RCEP framework and avoids potential risks caused by fluctuations in the value of the US dollar. Since 2018, China has launched a new "Trinity" strategy, including vigorously developing the CNY as a pricing currency in commodity transactions, speeding up the opening-up process of China's financial market, and fostering real demand for CNY in neighboring countries (Li, 2021). After the RCEP is signed, China needs to integrate the RCEP rules with the "Trinity" strategy to promote the orderly, stable and sustainable development of CNY internationalization.

Firstly, it should advance the construction of cross-border commodity exchanges and other related infrastructure within the RCEP. Li and He (2018) proposed to expand the cross-border use of CNY through the development of commodity trading, highlighting the construction of trading platforms to promote the development of CNY pricing for bulk commodities. This would promote the use of the CNY as a money of account and enhance the function as a money of account. Secondly, RCEP should be used to reshape China's industrial chain in East Asia. Under the RCEP framework, the East Asian industrial chain will show new trends such as optimization and upgrading of production layout, deepening of division of labor, regionalization of industrial chain and digitalization (Ma & Zhang, 2021). This could stabilize the supply chain and foster real demand for CNY in the RCEP free trade area. Thirdly, RCEP should be combined with the opening of the financial market. Cao and Hao (2016) state that how far the CNY could go internationally depends on the process of opening up the CNY capital account. In addition, the essence of capital account convertibility lies in developing a truly deep financial market that could provide safe and stable products. Thus the geographical advantages should be utilized to cooperate with governments or enterprises in the region to realize the mutual promotion of trade goals and financial goals, so as to promote the internationalization of CNY. The sovereign digital currency could improve the effectiveness of monetary policy and supervision capacity, and thus improve the financial risk prevention and control system of regional countries. Consequently, Chinese sovereign digital currency based on blockchain technology could become an effective path of the internationalization of CNY under RCEP framework.

CONCLUSION

The anti-globalization would weaken the political and economic dominance of the United States in the international arena, and further would weaken the international financial trade payment system dominated by the United States based on the dollar unit of account. In the current special political and economic environment, coupled with the COVID-19 pandemic, the depreciation pressure of US dollar increases sharply. For this reason, the exchange risk of US dollar settlement method increases continuously, which would prompt Southeast Asian companies to look to the CNY as the new reserve currency for trade settlement. After the signing of RCEP, with the rapid expansion of trade in the Asia-Pacific, enterprises in the region should need more CNY as a reserve currency for capital turnover, settlement and commodity procurement. Thus, the process of CNY internationalization is bound to accelerate.

Considering the characteristics of trade between RCEP member countries, digital currency transactions would be increasingly accepted by the masses. Meanwhile, the distributed bookkeeping features of the sovereign digital currency, it could enhance the effectiveness of monetary policy and regulatory capacity. Therefore, the sovereign digital currency based on block chain technology could effectively prevent and defuse financial risks of RCEP member countries. As a leading country in RCEP cooperation and the world's second largest economy, China has been promoting the internationalization of the CNY. The sovereign digital currency could improve the effectiveness of monetary policy and supervision capacity, and thus improve the financial risk prevention and control system of regional countries. Consequently, Chinese sovereign digital currency based on block chain technology could become an effective path of the internationalization of CNY under RCEP framework.

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THE STRATEGIES OF TEACHING BASIC PIANO COURSES FOR PRESCHOOL EDUCATION MAJOR IN CHINA

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ABSTRACT
In China, preschool education is the foundation of school education and lifelong education, and an important part of the national education system. Therefore, the training of preschool education majors, who are going to be teachers in the future, are very critical. At present, according to the needs of local social and economic development, preschool education majors in colleges and universities in various regions of China are constantly exploring vocational talent training models and teaching curriculum systems, so as to comprehensively improve the quality of vocational talents and social service ability. Piano course is a compulsory skill course for preschool education majors, but the low efficiency and poor quality of piano course for preschool education majors cannot meet the national vocational demand, which hinders the all-round development of students' vocational skills. This paper presents a systematic literature review (SLR) of the current pedagogy used in the basic piano curriculum for preschool education majors in China, and highlights some improved methods to promote piano teaching through reflective teaching. It aims to provide a reference for the piano teaching reform, so as to promote the development of the piano teaching system, and comprehensively improve the students' piano performance level and artistic quality.

Keywords:
preschool education major, piano education, piano teaching , Dalcroze, Orff

INTRODUCTION

In China, preschool education is mainly to cultivate good ideological and moral quality and physical and psychological quality to systematically master the basic theory and professional knowledge and modern preschool education skills (Ru, 2019). With high professional ability to engage in preschool education and management, cultivate applied talents with morality, intelligence, sports and beauty (Tang Siyu, 2016), can adapt to the needs of social development and reform, and can be competent for the teaching and management of early education institutions (Jiang, 2020). College students majoring in preschool education in China are employed as full-time kindergarten teachers after graduation.

Training teachers to become excellent talents is an important prerequisite for the development of quality education (Mustapha, 2019). Preschool education is the beginning of lifelong learning experience and an important part of the national education system (Jian, 2021). However, preschool education remains a weak link in China's basic education system (Yuan, 2019). The overall level and specialization degree of kindergarten teachers are not high, and the state has forward-looking requirements for the development of preschool education (Wang, 2020a), Therefore, it has become an urgent demand of the whole country, the society and parents to promote the overall quality of preschool teachers and the continuous improvement of the professional level of preschool teachers (Qiondan, 2021).

As China enters a new stage of development, it is imperative to achieve high-quality development of vocational education, in support of the 14th Five-Year Plan. The Ministry of Education of China has added some key points of work to the previous basis to promote the upgrading and transformation of vocational education majors：

a. Build a vocational education system with Chinese characteristics for a new era ; b. promote the quality and innovative development of higher education ; c. deepen education and teaching reform, improve the teaching and research work system, strengthen physical education and aesthetic education, and implement the measures to improve vocational skills ; d. In pre-vocational education and vocational training, related contents such as scientific quality and work safety. We will integrate vocational education, employment training, and skills improvement.

In the thirteenth Five-Year Plan (2016-2020), the Ministry of Education attaches great importance to the training of preschool education majors. At present, there are 51 independent preschool normal colleges in China, 23 of which are newly established between 2016 and 2020, mainly with secondary vocational and higher vocational degrees (China Ministry of Education, 2016). The Ministry of Education of China has made it clear that it should focus on cultivating the practical ability and professional skill of preschool teachers, and improve preschool education level by improving the ability level of preschool teachers.

In 2018, the Ministry of Education of China issued a number of regulations on the construction of preschool education courses, in order to improve the preschool education system, among which there are the suggestions on teaching methods and teaching: (1) "Student-centered", integrate the actual needs of curriculum teaching, flexibly use various teaching methods, stimulate students' interest in learning, improve teaching effect and quality; (2) implements various forms of "middle school, middle teaching" teaching mode, to help students expand more knowledge, solve learning confusion, enhance learning awareness, improve independent learning ability (China Ministry of Education, 2018).

The piano course, as a compulsory course of skill learning for preschool education majors, aims to train preschool teachers to demonstrate skilled basic piano skills and accompaniment skills, applicable to their professional needs, and to adapt to the requirements of the changing society (Dai, 2019). Piano education belongs to the classification of music education, and the essence of piano education is music quality education (Wang, 2020a). Through learning, performance, appreciation of piano works and other teaching methods, piano education brings students into a true, kind and beautiful art world. It allows students to be influenced by aesthetic education, stimulate their emotions, develop noble emotions and aesthetic taste, improve personality and improve overall quality (Wang, 2020b). This enhancement in the quality of learning supports the Ministry of Education of China's 2018 regulation to stimulate students' interest in learning, improve teaching effect and quality.

THE IMPORTANCE OF PIANO COURSES FOR PRESCHOOL EDUCATION MAJORS

With the development of China's market economy and the continuous improvement of people's overall living standards, the piano has become an important tool for ordinary families to cultivate children's interest (Wang, 2020b). Piano cognition and learning are becoming more and more extensive, which brings a certain impact on the piano skills requirements of kindergarten teachers (Jiashi, 2021).

The piano basic course is a compulsory course in the training of preschool education majors. The foundation of piano performance is a necessary vocational skill for preschool education majors. According to Ru (2019), piano learning can promote students to form good intonation and inner hearing, enhance music performance, so that students can accurately grasp various music images (Ru, 2019). Learning piano not only enables students to master the correct piano playing skills, but also enables students to expand their horizons in the music works and improve their aesthetic taste. Through the piano performance training, students can enhance their coordination ability and enhance students' listening ability (Hong, 2020)

Learning the piano in preschool education majors can effectively strengthen students' memory ability. In the actual teaching training, after students carefully read the score of each section, they can print various music elements in their minds. Although they will forget some after a period of time, they can still recall the past memory in the subsequent score reading training. After repeated practice, the students' memory ability will be significantly improved (Jiashi, 2021)

Through the learning of basic piano courses, it is a necessary skill for students majoring in preschool education to further strengthen the students playing ability and lay a good playing foundation for the accompaniment of children's songs (He, 2020). Students should attach great importance to it and should learn hard to master and understand the singing skills of the piano, which will be of great help to their future career development (Hong, 2020). Therefore, the use of piano plays an important role in preschool music teaching for college students (Zhiwei, 2020).

At present, vocational demand is the core of the training goal of higher vocational preschool education, and the ultimate goal is professionalism and training applied talents to meet social needs (Ru, 2019). Therefore, as the core course of preschool education college students, the basic piano curriculum must be guided by the occupation of preschool teacher (Jingxin, 2019). On the basis of following the rules of piano teaching, the reform should start from the teaching content, teaching methods, teaching methods and many other aspects. In order to improve the market competitiveness of preschool education college students, so that students have smooth employment (Wang, 2020a).
The literature collected in this paper is from China National Knowledge Infrastructure (CNKI), which is an authoritative database of academic papers and theses in China. In this paper, 45 representative journal articles were reviewed to highlight the current pedagogies used in teaching the basic piano course, and to derive at a clear statement of the status quo of piano curriculum research in preschool education majors in Chinese universities.

In recent years, the Ministry of Education of China has put forward many policies and suggestions on the talent training of preschool education majors. On CNKI, an authoritative academic database in China, the following search keywords i.e., preschool education major, piano course were keyed in. A total of 13,424 papers in the past six years resulted in the search. From the trend chart of papers published over the years, the study of piano courses in preschool education has been attracted with much attention in the recent past 6 years (Figure 1). However, as a result of the Novel Coronavirus outbreak, the research rigor has decreased.

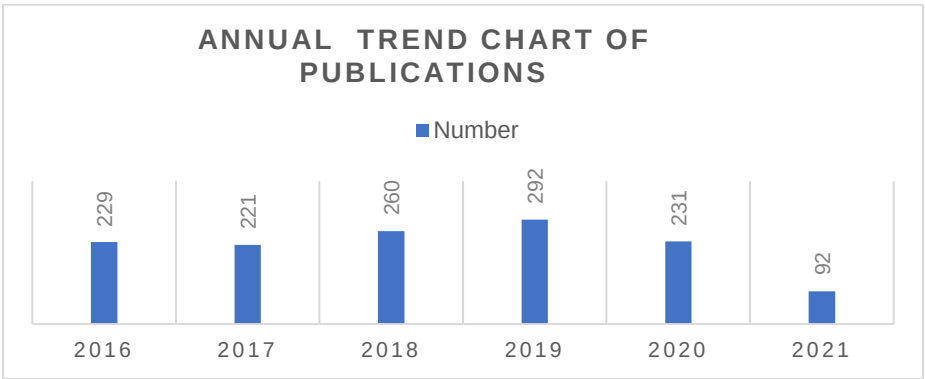

Figure 1：2016-2021 Paper publication trend chart (CNKI, 2021)

The main themes of past studies and percentage of that studies are the presented in Figure 2: 39% of researchers put forward the strategy to adjust the status quo stated that according to the policy of the Chinese Ministry of Education; 31% of researchers, in order to improve the students' learning efficiency on teaching method reform, put forward the use of western music in the piano teaching

method; 13% of the researchers advocate the concept of aesthetic education and emphasize the value and importance of aesthetic education to students, 9% of them believe that the focus should be on playing children's songs, and 8% of the researches explores multimedia and online teaching.

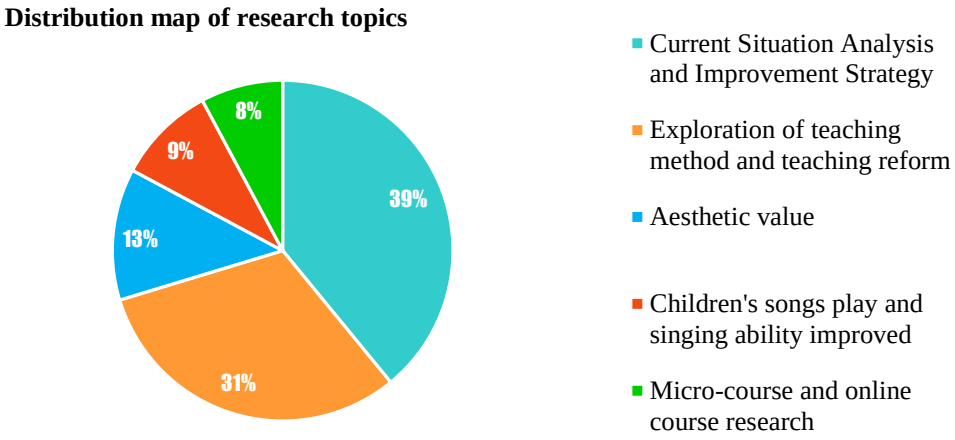

Figure 2：Distribution of main research topics (CNKI, 2021)

According to the data, in recent years, due to the importance emphasized by the Ministry of Education of China on vocational education, the research on the reform of basic piano courses for preschool education majors in colleges and universities has gradually drawn attention. Piano teachers have begun to attach importance to teaching reform, and in order to improve efficiency, they have continuously explored the strategy of teaching students according to their aptitude.

THE STATUS QUO OF PIANO COURSES FOR PRESCHOOL EDUCATION MAJORS

The 30 journal articles reviewed in this paper highlighted the following significant problems with piano courses for preschool education majors:

STUDENTS' MUSIC FOUNDATION

In China, the schools that preschool education majors are mainly normal universities and vocational education colleges. The students are mostly graduates from less developed areas (Jian, 2021). Music education in less developed areas is systematic, normative and professional, leading to a weak musical foundation for students. The survey showed that only 2% to 3% of students had the ability to read wireless scores, suggesting a serious lack of musical base for preschool students. Students lack the foundation prior to school for knowledge of music theory, instrumental performance, dance art, and music appreciation, let alone the expressive power and creativity of music (Liu & Li, 2019). This poses a great challenge for the career orientation of preschool majors-training qualified kindergarten teachers (Zhang, 2019).

THE TEACHING METHOD

The piano course is one of the basic courses of the music major. Weak foundation of students, monotonous teaching method result the large achievement gap between students and their interest in piano learning is not high (Ning, 2020). Music major piano courses and normal major piano courses basically follow the traditional western "one-to-one" teaching methods (Penghong, 2019). But music and piano students are only "teacher to students", and the piano courses for other normal majors basically adopt the group or group classroom teaching mode (Ron, 2020). In the classroom, due to the large number of students in each group, with only one teacher, so the teaching form is collective teaching, The entire group under the guidance of one teacher, who explains how to play the music. During the break, the teacher checks the student one-on-one check play, each student for about 5 minutes (He, 2020). Such a teaching model saves time and solves the teacher shortage. However, due to the particularity of the piano, the collective teaching effect is relatively poor(Jiashi, 2021).

The traditional piano teaching method uses the "one-to-one" teaching method, and the process is the teaching mode of "teacher explanation-demonstration, performance-imitation, practice-teacher correction practice" (Ru, 2019). Due to lack of communication and interaction, most teachers can only have teaching and demonstration, which affects students' ability of independent learning and experience. Students rely too much on teachers, lack of learning initiative, and make mistakes in after-class practice, leading to poor quality and inefficiency (Yanxin, 2018). Teachers have done less research on some new teaching methods, resulting in boring piano lessons and poor classroom learning atmosphere (Lili, 2020).

There are also some problems in the teaching scheme of piano courses, and the course is biased towards skill training (Ning, 2020). However, it only pays attention to the learning and cultivation of students' piano performance skills, which only explains the music knowledge and often ignores the cultivation of students' comprehensive music quality, leading to low learning efficiency (Jingxin, 2019).

CONTENT OF COURSES

At present, there is also a gap between the limitations and the practical implementation of the preschool education professional piano curriculum in the teaching materials (Xiaomin, 2017). In China, because the piano is a western musical instrument, most of the courses mainly use western piano music works, and the repertoire is relatively monotonous and boring (Yanyan, 2020), because the students are not familiar with the western music and cultural background, so it weakens the enthusiasm of students to study (Bingjie, 2020). And it is difficult to use some western music works in music practice teaching (Wu & Yang, 2020). Boring finger practice has been a challenge for adult college students' finger skills, which weakens students' enthusiasm for learning to a certain extent (Zhan, 2021).

Piano learning for preschool students belongs to the primary piano learning stage, most of which are primary western piano. However, these textbooks (Table 1) have not been updated for a long time and lack of interest (Jiashi, 2021).

Table 1: Common teaching books

Finger exercises	Music composition Book
Elementary Instruction Book for the Pianoforte Op.101 (Ferdinand Beyer)	John Thompson's Modern course for the piano
Practical Method for Beginners on the Pianoforte Op.599 (Carl Czerny)	
The Virtuoso Pianist in Sixty Exercises for the Pianoforte(Charles-Louis Hanon)	

EXPLORATION OF THE EXISTING TEACHING PRACTICE

Through the review of literature, this paper found that with the social and professional needs, more piano teachers majoring in preschool education have begun to study and practice new teaching methods such as using western teaching methods, changing teaching mode, using multimedia teaching tools and online micro-courses have become popular research, because teachers can help and inspire future teachers by discovering classroom strategies (Saimin, 2019).
Aiming at the teaching reform of piano course in preschool education major, this paper selects and classifies 30 of the literature from the popular Orff teaching method, Dalcroze teaching method and the latest teaching methods:

Table 2: The authors and their 30 articles

Research topics	**Number of researches**	**Author and year of publication**
Orff teaching method	10	Ying (2021); Zhiyi (2021);Sun Mengmeng (2020); Ni (2019); Jing (2019); Huan (2019); Biqiang (2019); Zhao Jing (2019); Honmin (2018); Yuanning (2018)
Dalcroze teaching method	10	Chen Ron (2020); Lili (2020); Jiawen (2020); Tong Xin (2018); Xiaoxia (2017); Ziwei (2017); Nie Rong (2017); Gu Li (2017); Wang Bei (2017); Chen Xu (2016)
Other methods	10	Jian (2021); Xiao Yao (2021); Tong (2021); Jing (2021); Zhen Na (2021); Wang Tong (2021);Nong Liying & Liao Chen (2021); Xueying (2020); Liyuan (2020); Chao (2020)

In piano practice and teaching, most teachers tend to explore the three major music teaching methods: Dalcroze, Koday and Orff (Din, 2020). Dalcroze music teaching method is mainly teaching practice by using the body rhythm, solo and impromptu music activities, and also includes visual music training for music training; The Kodaly teaching method emphasizes that music education should start from kindergarten, music materials should be Hungarian folk songs and singing games, and the native language of music needs to be used as primary education (Bing, 2016).

This method focuses mainly on singing as the main music education method, with vocal music courses. The Orff pedagogy emphasizes original music that focuses on the development of the inner world and freely expresses the musical rhythm with its own body, language, and musical instruments (Jin, 2019).

The systematic literature review in this paper revealed the percentage of research papers using the above three methods (Figure 3).

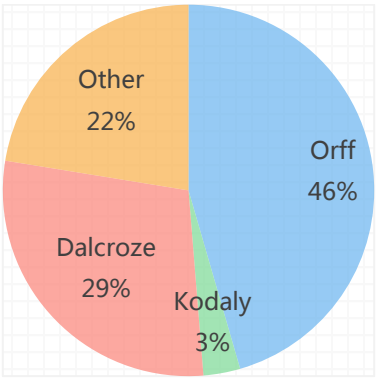

Figure 3: Research papers on music teaching from 2016 to 2021(CNKI, 2021)

ORFF MUSIC TEACHING

At present, in the basic piano course of our country, most researchers choose Orff music teaching method as the teaching reform strategy. 10 relevant literature are selected for this study. Teachers mainly take percussion instruments as auxiliary, paying attention to students' rhythm practice, in order to stimulate students' creativity, and with the help of Orff's rich training and teaching materials, carry out classroom practice, which can help students to integrate momentum into music appreciation, to improve students' musical quality (Ni, 2019).

Orff's teaching method is mainly based on rhythm training. Some teachers pay attention to classroom practice on rhythm training, improve students' music perception through rhythm training, and integrate music and actions to enhance students' musical imagination (Jing, 2019). In preschool education professional piano class using Orff teaching method, through the Orff teaching method, changes the previous "teacher model, students imitate" teaching model (Huan, 2019), takes small class, improves teaching quality and efficiency, improves teachers' overall quality, perfects teaching evaluation, comprehensively assesses students learning effect releases students' music potential (Ying, 2021), adopts students to the current social demand of innovative, applied talents, and lays the foundation for the future career needs (Zhang, 2018).

Li (2018) assert that from the aspect of innovation the core of preschool education major piano curriculum should be improvisation, improvisation can develop students' creative ability (Li, 2018), this coincides with Orff teaching that "improvisation is the oldest, the most natural form of music, is the most direct form of emotional display", in the classroom based on rhythm, reading, combination with action, use of Orff musical instrument, music ability training, improvisation and other form (Biqiang, 2019).

Some scholars also analyzed the advantages of Orff for piano courses of preschool education majors from the perspective of humanistic thoughts. The "humanistic thought" of Orff teaching method is very suitable for teaching preschool education majors piano collective lessons, but will train the momentum used in piano teaching has a great influence on students' enthusiasm and practicality of learning the piano (Zhao, 2019). Orff teaching method from the students' point of view, through students' personal experience, it has application value in cultivating students' personality and creative ability (Sun, 2020).The piano instructor flexibly applied Orff teaching method in the group

class, guided students to realize self-improvement in the integration of language, movement and music, improved students' participation, and solved the problems students encountered in learning (Zhiyi, 2021).

This kind of practical inquiry is mainly the cultivation of music rhythm and quality, with teaching method and piano skills learning separately. It has certain limitations for preschool education majors with less time to learn piano, which may lead to the failure to complete the teaching goals on time.

DALCROZE MUSIC TEACHING METHOD

This study collated the literature of 11 researchers advocating the use of Dalcroze method in piano teaching.

At present, China's research on Dalcroze mainly focuses on the field of music education, most of which summarizes the idea, theory and content of Dalcroze state rhythm teaching method (Xiaoxia, 2017). In piano teaching, mainly to introduce the basic theory of Dalcroze teaching method, we discuss the inefficient student piano course teacher and a monotonous teaching method (Ziwei, 2017), and propose that the use of teaching method in the Dalcroze process can stimulate students 'interest, improve students' learning efficiency, and enrich teachers' teaching methods (Jiawen, 2020). Studies by 4 researchers examine in detail the body rhythms of the Dalcroze method, For example, the characteristics of music and physical relationship and physical rhythm training, then analyzes of the problems of piano teaching in higher vocational preschool education, and finally proposal of a relevant strategy to help the future teaching work (Lili, 2020). Nie Rong's thesis introduce the origin and development of Dalcroze , Orff posture rhythm teaching method to study and observation classroom, It is hoped that the training of body rhythm will enable students to better understand and express musical emotions and enrich their teaching methods (Nie, 2017). Chen Ron's PhD thesis explains the relationship between action and music, the expression of action in music learning, and analyzes the value and significance of motion perception for auditory learning. In the thesis, comparing the two theories of "Laban human dynamic rhythm" (Ron, 2020, p.48) and "Dalcroze state rhythm teaching method" (Ron, 2020, P, 96), the study reveals the importance of "conscious reflection" (Ron, 2020, p.114) for music learning. It is clarified that the combination of action and music can strengthen the physical and mental connection, and implement concrete music learning to promote personalization and overall participation. The thesis explores how action provides material guarantees for examining the sensory quality of music and its relationship with music knowledge, how it turns our attention and interest to student life experiences associated with music practice, finally concluding that music learning can beneficial utilize the overall physical experience, and physical participation can experience and express musical emotions (Ron, 2020).

In addition, four researchers explored the development of Dalcroze teaching method on students' aesthetic interest in piano class from the concept of aesthetic education. Tong (2018) believes that Dalcroze's body rhythm teaching focuses on experience prior to cognition, making music the means of shaping personality and enhancing aesthetic appreciation (Xin, 2018). Chen (2016) pointed out in his research that the impromptu accompaniment of Dalcroze teaching is of practical significance to piano class, and the Dalcroze teaching concept is unified with the concept of Chinese music education, which meets the practical requirements of piano courses for Chinese preschool education majors (Xu, 2016). Researcher Guli（2017）pointed out that Dalcroze teaching method enables students to better master music elements and improve students' aesthetic ability. Using Dalcroze teaching method in class can stimulate students' creative ability and collaboration ability (Guli, 2017). In Wang（2017）research, he explored integrated classroom and found that Dalcroze can enrich students' aesthetic ability in training and has strong practicality (Bei, 2017).

OTHER TEACHING METHODS

In this study, 9 researchers focused on their curriculum reforms in terms of curriculum settings or methods. Through practical application and problems combined with investigation and interviews, he effectively promoted the improvement of learning interest, independent inquiry ability and comprehensive ability. For the problems of cooperative study, Jian (2021) confirmed the availability of the teaching method..

Researchers also conducted research in the teaching mode and assessment, putting forward that the piano skills training in the basic piano courses of preschool education majors should be standardized and unified, and the teaching mode can be divided into large and small classes with individual groups (Yanan, 2018). Xiao (2021) proposed stratified teaching, which can not only optimize the current teaching mode and promote the communication between teachers and students, but also cultivate students' teaching practice ability (Yao, 2021). Some researchers put forward the modular curriculum construction, integrating the knowledge and skills of music teaching into the basic piano performance content system of preschool education, and finally making students have the ability to organically use all kinds of new teaching methods to carry out teaching through relevant teaching (Xueying, 2020). Teachers of preschool education majors should avoid the traditional monotonous teaching methods, and instead, special lectures and open classes are to be held to promote the development of students' professional skills (Tong, 2021a), build objective and scientific evaluation results from many aspects of students' mid-term investigation and educational internship, and finally form objective and scientific evaluation results, so as to comprehensively improve students' piano playing ability (Linyue, 2020).

In order to keep pace with the times, flipped classroom, also known as "inverted classroom", is used to optimize and adjust the time inside and outside the classroom, so that students have the right to decide on learning. The flipped classroom was first used in the educational practice of western military academies. Teachers send relevant materials to students before class and require students to learn independently. In the formal teaching stage, a series of discussion activities between teachers and students are organized to solve problems together in communication and interaction (Chao, 2020). This method effectively strengthens the implementation of the piano teaching reform, regulates the time inside and outside the classroom, shifts the learning decision from teachers to students, promotes the thorough transformation of the role of teachers and students, and constructs a stable and intimate teacher-student relationship, but lacks improvement in students' piano performance and musical performance.

With the "Internet +" mode into Chinese industries, college education also follows the trend, updates teaching ideas and teaching methods (Na, 2021). The use of Internet teaching and micro teaching enriches the classroom content, improves the enthusiasm of learning for students to learn piano technology and understand music knowledge (Jing, 2021). Online courses are convenient and fast, but there are also certain limitations to the learning of piano skills. Students lack real experience of precise finger key requirements and the use of physical strength, which may produce wrong playing methods, thus adding obstacles and repetition of learning.

Due to the market and vocational demand-oriented approach, the OBE (Outcome-Based Education) teaching concept has emerged in the vocational education curriculum reform in China in recent years. The significance of OBE is to challenge the subject system itself and take students' employment needs as the final output goal, and the whole curriculum learning process revolves around this goal (Nong & Liao, 2021). In the piano discipline of preschool education, there is the division of knowledge points and technical points and the arrangement of learning process (Tong, 2021). This teaching concept not only grasps the piano playing technology and knowledge, but also is able to timely teach according to their own conditions.

Through the analysis of literature, it is clear that preschool education professional piano course problems basically exist in students, teachers and teaching methods, and the research mainly focuses

on improving students' playing skills and music quality, most are conceptual theoretical analysis, lack of practical application and data demonstration, there are still certain limitations.

SUGGESTED TEACHING STRATEGY

Through the analysis and induction of previous studies, 10 researchers believe that Dalcroze is the best application in piano courses of preschool education majors. They are based on the practical teaching experience, the integration of western teaching method and piano skills. The effective combination of learning helps improve students' interest and comprehensive quality.

TEACHING METHOD

This researcher believes that Dalcroze music teaching method is suitable for students majoring in preschool education, because this teaching method can train students' comprehensive music ability and meets the training and development requirements of the Ministry of Education for preschool education majors. Moreover, positive emotions can make learning more effective and interesting, while negative emotions can hinder learners' progress (Mustapha, 2018).

Table 3: From the Ministry of Education of China on the training of students majoring In preschool education (Araneda, 2019).

Chinese Ministry of Education training Guide	**Basic concepts of Dalcroze teaching method**
Student centered	Dalcroze teaching method focuses on the inner feelings of students must know how to analyze and interpret music, and pay attention to the joint perception and expression of music rhythm, hearing, expression and emotion.
Take the initiative to construct knowledge	Dalcroze teaching method advocates students for the active construction of music. Music is closely related to the movement changes of time, space and power. Students construct and express music according to their own feelings and experience.
Strengthen students' social ability	Dalcroze states that body rhythms themselves have unlimited creativity, and this means of communicating and communicating through action is a life skill that one must learn.
Cultivate students' situational thinking	In the Dalcroze teaching method, students need to follow their sound changes and present different states and situations.
Strengthen the students' coordination ability	Dalcroze's physical rhythm course, starting from walking, to find the natural balance and steady rhythm sense, emphasizing the coordinated development of students, physical rhythm class is unique in the combination of structural elements (rhythm, rhythm, rhythm, texture, phrases and form) and aesthetic elements (dynamic, nuance, clarity and emotion)
We will comprehensively develop our comprehensive capacity	Dalcroze teaching method emphasizes the development of "inner hearing", from the development of inside to outside, driving the all-round training of body, heart and brain, so that students can better experience music.

From the perspective of modern education, this teaching method is more in line with the current educational concepts, which has attracted widespread attention. There are three points of Dalcroze music pedagogy, namely the emphasis on improvisation, the combination of rhythm and posture, and playing learning patterns (Jiawen, 2020).

TEACHING CONTENT

In terms of the selection of teaching content, due to national policies and teaching experience, most researchers tend to localize music teaching. First of all, The Ministry of Education of China highly emphasizes the inheritance and development of traditional Chinese culture in education reform. As the key to China's education system, universities and colleges have an important role in the spreading of traditional Chinese culture in the teaching process. Therefore, in recent years, various universities in China have paid more and more attention to the teaching of ethnic music. Secondly, students are supposed to have a strong ability to accept and learn from their own culture, which can also be used in their future music teaching activities.

The study of national music has a profound significance to teaching which are:

THE EXTENSIVE SPREAD OF NATIONAL CULTURE

Traditional culture and folk music are neglected in the piano learning, and piano art. However, as an important means of communication of music art, is inseparable from the spread of traditional Chinese music culture (Jingwen, 2021). The primary stage of piano learning is a period of establishing a strong national consciousness and taking powerful steps for the spread of Chinese folk music (Luo, 2018).

THE INTEGRATION OF CHINESE CULTURE AND WESTERN CULTURE

The charm of Chinese traditional music works lies in its connotation and implicit feeling, which can give appreciators the feeling of beauty, By combining with the Dalcroze teaching methods, it not only increases the students' enthusiasm for participation, but also improves the teaching effect and consolidates the cultural learning of the nation (Biejia, 2020), Promote the inheritance and innovation of national piano music (Wu & Yang, 2020), On the basis of western piano education, combining with Chinese traditional folk music culture, the piano teaching mode with Chinese characteristics is created to promote the further development of Chinese music art and to show the charm of Chinese music culture (Luo, 2018).

REDUCING LOCAL CULTURAL CRISIS

The integration of folk music and music education can help students establish correct and positive values and improve their core quality. This is an effective way to train high-quality talent (Wan Wei, 2021), and the inclusion of Chinese folk music content in piano teaching helps to upgrade teaching reform and cope with the cultural crisis (Biejia, 2020).

CONCLUSION

This study refers to, reviews and analyzes 45 research papers on the piano courses in preschool education major in the past six years, identified the status quo and problems of piano courses in this major. The analysis shows that the reform of piano teaching in colleges and universities in China is necessary. However, due to the lack of data demonstration, practical teaching still has some limitations, and it is also relatively lacking in China's national piano teaching research.

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THE INFLUENCE OF NEW RETAIL MARKETING MODEL ON CUSTOMER SATISFACTION: REVIEW OF ACADEMIC LITERATURE

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ABSTRACT
Marketing mode plays a crucial role for brands. However, since the success of marketing models depends on customer satisfaction, it is important to study the factors that affect customer satisfaction. With the development of the Internet and the trend of economic globalization, the traditional marketing model has been difficult for brands to get more consumers, and to improve customer satisfaction, it is necessary to seek new marketing models. This study attempts to analyze the impact of the new retail marketing model on customer satisfaction with customer perceived value as a mediating variable from the perspective of literature measurement and proposes a conceptual framework to explore the impact of the new retail marketing model on customer satisfaction of Chinese fast fashion brands, so as to provide reference for the future exploration of the new retail marketing model. This study has some limitations, and the sample size should be large to improve and support the validity and reliability of the results. For future studies, sample size should be more representative in order to improve the reliability of the study. At the same time, future research can also be conducted on personal characteristics or social media as an intermediary/mediator between the new retail marketing model and customer satisfaction.

Keywords:
new retail marketing model, customer satisfaction, Chinese fast fashion brands

INTRODUCTION

In the context of the globalization of China's apparel industry and the rapid development of Internet technology, more and more international brands are choosing to enter the Chinese market, which will inevitably have an impact on the existing domestic apparel industry (Yao, 2020). With the rapid expansion of international fast fashion brands such as Uniqlo, Zara, and H&M in China and the increasing attention of domestic consumers to the concept of fashion, these fast fashion brands bring different consumption experiences to consumers with new marketing strategies, and fast fashion has gradually become the mainstream of domestic apparel consumption, winning the favor of a large number of consumers (Guo, 2015; Niu & Shen, 2020). However, the traditional clothing industry has been strongly impacted. some local apparel companies in China do not have a complete marketing system to support them, retailers are not familiar with the new retail marketing model, and they do not have a complete marketing integration to link their activities with customers' needs (Guo, 2020). The traditional marketing concept is difficult to be transformed through the Internet (Liu et al., 2021). It is obvious that the marketing method relying on publicity alone can no longer satisfy retailers (Xu, 2020). Standardized products and services no longer meet consumer expectations (Cen, 2020).

The only way to change marketing methods is to provide consumers with more effective and better service experience by utilizing advanced technologies such as big data and combining offline experience (Guo & Huang, 2020). Under the digital application and the open policy of "One Belt and One Road", "new retail" can bring more effective new supply and will become the main direction of social and economic reform in the future (Jiang, 2018). Chinese apparel companies should recognize the importance of improving customer satisfaction and find a marketing model suitable for China's development. (Guo, 2015). With the continuous economic development, enhancing customer satisfaction has become an important way for enterprises to enhance competitiveness (Li, 2019).

Improve the satisfaction of existing customers, which means that more customers will buy the company's products repeatedly in the future, thus improving the profitability of the company (Guo & Huang, 2020).

In the field of fast fashion apparel brands, empirical studies on the factors influencing customer satisfaction under the new retail marketing model are very scarce, and the rapid development of fast fashion apparel urgently needs the guidance of corresponding theories (Guo & Huang, 2020). The concept of customer perceived value has become one of the most commonly used research methods for enterprise managers and marketing researchers (Silva et al., 2018). For the literature in the online field of customer perceived value, there is a clear direction for the characteristics of customer perceived value. The role of perceived value in the process of influencing the new retail marketing model and customer satisfaction needs to be further studied (Chen et al., 2020). Aims for this study is to explores the factors that influence customer satisfaction of Chinese fast fashion brands under the new retail marketing model.

LITERATURE REVIEW

The following is a review of new retail marketing model as independent variables, customer satisfaction to be the dependent variable, customer perceived value (includes: consumer perceived variety, consumers' perceived risk, consumers' perceived convenience) as mediating variables anchoring the study.

New Retil

New Retail from the perspective of marketing theory as all activities that enterprises apply advanced Internet thoughts and technologies, use the latest concepts and thinking as the guidance, improve and innovate traditional retail methods, and sell goods and services to final consumers as well (Zhao & Xu, 2017). New Retail is an effective integration of online and offline channels, consumer-centered, and through the deep combination of data and business logic to achieve "goods - market - people" to "people - goods - market". It meets the needs of customers for complex experiences and has improved the efficiency of marketing and corporate efficiency (Li, 2020; Wang et al., 2020). The new retail marketing model has the following three main characteristics:

Customer Sense of Participate

In order to increase the share of customers, marketing plans are essential to improve the customer experience (Abd Manan & Mokhtar, 2013). The essence of the new retail marketing model is still to emphasize the consumer - centered retail. Customer sense of participate is the foundation for the development of "new retail". It is an effective integration of online and offline channels to meet the needs of customers for complex experiences (Li, 2020; Zhao & Xu, 2017).

Convenience of Modern Logistics

The "new retail" is a general data-driven retail form centering on consumer experience, whose core is to reconstruct the supply chain in new business and maximize the efficiency of distribution. It is an extension of the Online to Offline model, which focuses more on logistics coordination and customer experience. The essence of retail remains the same, which is still cost, efficiency and experience. Among them, green supply chain management hence reducing the project cost while creating satisfied customers (Eliwa & Ayob, 2020; Zhao & Xu, 2017).

Online & Offline Services and Experiences

The development of the new retail industry is based on information technology. On the one hand, it creates an ecosystem in which the production, circulation and sale of products is a cyclical process. On the other hand, it combines online and offline as well as modern logistics. In fact, the new retail still effectively guarantees end-to-end distribution (Balaji & Roy, 2017; Li, 2020; Zhao & Xu, 2017).

Customer Satisfaction

Customer satisfaction as "the perception of the customer as a result of consciously or unconsciously comparing his experiences with his expectations" (Yang et al., 2017, p. 131). Customer satisfaction is an important key factor in marketing. In terms of improving customer satisfaction, retailers should pay attention to customer expectations, and if the performance of the product exceeds the expectation of consumers, they will be satisfied (Khadka & Maharjan, 2017; Wang et al., 2020). Therefore, in this study, customer satisfaction refers to customers' expectations of Chinese fast fashion brand products or services during shopping.

Customer Perceived Value

The concept of customer perceived value has become one of the most used research methods for enterprise managers and marketing researchers (Silva et al., 2018). Customer perceived value is the perceived utility of a product or service relative to the purchase price. It is a subjective feeling experienced by consumers when they buy products or services (Kim & Ammeter, 2018). Customer perceived value is mainly composed of "perceived diversity", "perceived risk" and "perceived convenience" (Emrich et al., 2015). Therefore, in this study, customer perceived value refers to the subjective feelings generated by customers on a series of activities in the shopping process when they buy Chinese fast fashion brand clothing.

Consumer Perceived Variety

Perceived variety refers to the consumer's judgment of the quantity and variety of a particular category of goods and it makes firms enhance the quality levels products and services offered (Zhu et al., 2018). The level of comfort in conducting transactions is included in consumer perceived variety. When consumers are concerned about perceived diversity, it may stimulate them to change their existing preferences to achieve higher satisfaction (Bilgicer et al., 2015). Therefore, in this study, perceived variety refers to customers' perception of clothing type, quality and service experience when buying Chinese fast fashion brands.

Consumers' Perceived Risk

The consumer perceived risk refers to the spirit cost associated with customers' purchasing behavior, which the consumer's uncertainty about the product's performance before shopping occurs. Consumer perception of risk is an inner experience that cannot be observed directly, and it will directly affect the consumers' purchase intention (Hilverda et al., 2018; Zhang & Yu, 2020). Therefore, in this study, consumer perceived risk refers to consumers' uncertain psychology of not having the opportunity to contact and perceive products before purchase when shopping online.

Consumers' Perceived Convenience

Consumer perceived convenience is defined as consumers' perception of the relative time and effort spent buying or using a service. Among them, communicate information effectively so that customers have a better understanding. And it can also be defined as individual preferences for convenient

products or services (Abd Rahim, 2018; Pandey et al., 2020). Convenience has become one of the main motivations that customers tend to adopt online shopping because it is a fast and simple service (Duarte et al., 2018). Therefore, in this study, consumer perceived convenience refers to minimizing the time and effort it takes a customer to purchase a product.

THEORIES

A theory is a set of principles developed to explain a group of facts that have been tested repeatedly using scientific means to make predictions. A theoretical framework is a collection of interrelated ideas that are based on theories that attempts to clarify phenomena and it could assist researchers in situating and contextualizing formal theories into their studies as a guide (Adom et al., 2018; Ravitch & Carl, 2016). In this study, the following three theories will be explained, which can serve as the basis for research on the impact of new retail on customer satisfaction.

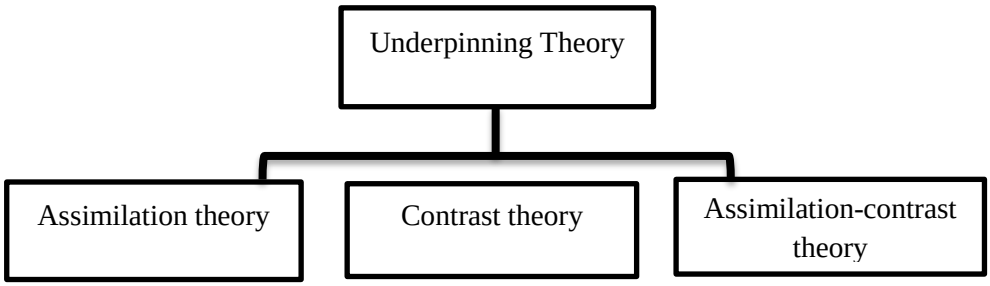

Figure 1: Underpinning Theories

Assimilation theory

Festinger's dissonance theory is the basis of assimilation theory (Isac & Rusu, 2014). The theory states that if a person expecting a high-value product gets a low-value product, customer will recognize the difference and also develop a mindset of cognitive dissonance. For example, when a customer buys a product and finds that there is a difference between his original expectation of the product and his perceived performance of the product, there will be disharmony or negative unconfirmation (Cardozo, 1965; Malär et al., 2018). This idea of using post-evaluation is introduced in the literature that discusses satisfaction in the form of assimilation theory (Yüksel & Yüksel, 2008).

This theory assumes that consumers are sufficiently motivated to adjust their expectations and perceptions of product performance (Anderson, 1973). If consumers adjust their expectations or perceptions of product performance, dissatisfaction will not be the result of the post-use process (Vasić et al., 2019). For example, if there is a difference between product expectations and product performance, consumers may develop psychological tension and try to reduce this tension by changing their perception of the product (William et al., 2016). Consumers can change their initial expectations of the product to align it with perceived product performance. Or by reducing perceived product inconsistencies, thereby increasing satisfaction, and reducing tension caused by the difference between expectations and product/service performance (Anderson, 1973; Zhang & Yu, 2020).

Taking consumer perceived variety as the mediating variable to adjust the influence between new retail marketing model and customer satisfaction, the relationship between the two variables can be explored by combining with the assimilation theory. According to this theory, the assumption that consumer perceived variety allows consumers to adjust their expectations and product performance perception to improve customer satisfaction is of great help to this research.

Contrast theory

Contrast theory is another theory proposed in assimilation theory to use a post-evaluation process that leads to the opposite predicted outcome of the expected impact on satisfaction (Cardozo, 1965). This approach states that whenever customers attempt to purchase a product inaccurately, they will exaggerate the difference between their previous expectations and the actual product/service performance by changing their assessment to deviate from their expectations (Hult et al., 2019; Suyanto et al., 2019).

Contrast theory offers the opposite of dissonance theory. Assimilation theory holds that consumers will minimize the difference between expectations and performance, while contrast theory holds that if consumers receive products of lower value than expected. Then consumers will exaggerate the difference between expectations and product evaluations (Anderson, 1973; Yüksel & Yüksel, 2008). In other words, contrast theory assumes that "deviating from the expected results will lead customers to react favorably or unfavorably to the brand, because a negative attitude is believed to lead to a poor product evaluation and not to a highly rated product" (Junges et al., 2021; Oliver, 1977). For example, when a consumer shops, he may say that the clothing brand is one of the worst he or she has ever worn, that no one will buy this clothing, etc.

Consumers' perceived risk is used as a mediating variable to adjust the impact of the new retail marketing model on customer satisfaction, and the contrast theory is used to explore the relationship between them (Zhang & Yu, 2020). According to this theory, it is assumed that consumers' perceived risk can be adjusted so that retailers can inform consumers of their uncertainty of products in advance and will not over-describe their products or services. Then the gap between consumers' expectations and reality will be narrowed and customer satisfaction will be improved. This is of great significance to this research.

Assimilation-contrast theory

The theory of assimilative contrast has been suggested as another way to explain the relationships between variables in inconsistent models (Hovland et al., 1957). This theory, a combination of assimilation theory and contrast theory, assumes that satisfaction depends on the size of the difference between expected and perceived performance (Schiebler, 2019).

As with assimilation theory, customers have a tendency to assimilate or adjust perceived differences in product performance to bring them up to their previous expected level, but only when the differences are relatively small. When there is a large difference between expected and perceived performance, there will be a contrast effect, and consumers tend to magnify the perceived difference. If the differences are too large to be assimilated, a contrast effect occurs. This theory attempts to explain the applicability of both assimilation theory and contrast theory in consumer satisfaction studies (Isac & Rusu, 2014; Schiebler, 2019).

Consumers' perceived convenience is used as a mediating variable to adjust the impact of the new retail marketing model on customer satisfaction, and the assimilation-contrast theory is used to explore the relationship between them. According to this theory, it is assumed that through the adjustment of consumers' perceived convenience, on the one hand, it can reduce the time and effort consumers spend on purchasing products, on the other hand, it can reduce the uncertainty of consumers' online shopping. This can increase customer expectations, thereby increasing customer satisfaction. This is very important for this research.

CONCEPTUAL FRAMEWORK

Although there have been related studies in recent years, there are still some gaps. This study found few studies on the topic of customer satisfaction for Chinese fast fashion brands with new retail marketing models, and the findings seem to be unclear. It may still be controversial as to which factors affect customer satisfaction. Importantly, these studies were done before the emergence of the new crown epidemic, and this trend may change over time, while the degree of influence of factors that lead to customer satisfaction may differ from the past. Therefore, it is critical that this research be conducted.

Based on previous studies on the theoretical framework of Customer satisfaction, this study proposed a conceptual framework to understand how the new retail marketing model affects Customer satisfaction and explore Customer Perceived Value (includes: Whether Consumer Perceived Variety, Consumers' Perceived Risk and Consumers' Perceived Convenience act as mediators. The Assimilation Theory holds that consumers have enough motivation to adjust their expectations and perceptions of product performance, so Chinese fast fashion brands can change consumers' expectations from different angles by using the new retail marketing model, thus playing an important role in influencing customer satisfaction. Contrast theory is that consumers' expectations deviate too far from their real perception, and they will change their original expectations, thus exaggerating their satisfaction. Therefore, by using the new retail marketing model, Chinese fast fashion brands can reduce the gap between consumers' expectations and improve customer satisfaction. The assimilation-contrast theory can guide the impact of the new retail marketing model on Customer satisfaction by adjusting Customer Perceived Value. The resulting conceptual framework is shown in the figure below:

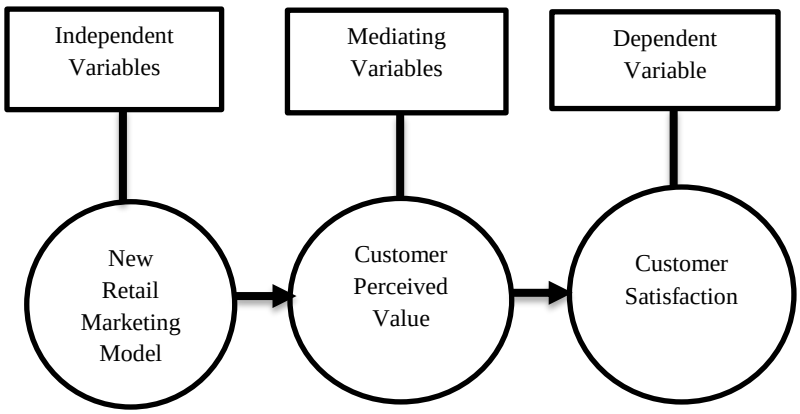

Figure 2: Conceptual Framework

Based on a review of the literature, this study concludes that the use of new retail marketing models has a direct and indirect impact on customer satisfaction. Indirect impact is assumed to be adjusted by customer perceived value.

CONTRIBUTION TO KNOWLEDGE

This framework also makes some contributions to the academic performance that affects customer satisfaction in the context of new retail.

Firstly, the conceptual framework adds a major contribution to the current theory of new retail marketing model research, that is, to study and analyze the impact of new retail marketing model on customer satisfaction based on customer perceived value as Mediating Variables. Secondly, guided

by the assimilation theory, contrast theory and assimilation-contrast theory, it will contribute to academic discussion in the context of the new retail marketing model. And finally, this research explores the impact of the three characteristics of the new retail marketing model (Customer participation, multi-channel retail environment, develop innovative and efficient supply chain) on customer satisfaction, it also provides a framework for future research on customer satisfaction.

CONCLUSION

Facing the competition from foreign fast fashion brands, Chinese fast fashion brands should also change their marketing strategies to obtain more customer satisfaction for their own brands. This paper reviews the related literature, as the new retail marketing model for the influence of customer satisfaction provides a framework. Customer perceived value as a intervening variable, as the research provide a more precise guidance, through the conceptual framework of this paper, trying to use quantitative research to verify the new retail marketing model has a positive effect on customer satisfaction factors.

This study has some limitations that need to be deal with in future studies. Firstly, this study considers new retail marketing model, the generalization of the model results can only be determined when more studies have considered the proposed approach for different regions of China. Secondly, the size sample of study should be large to improve and support validity and reliability result.

For future research, to improve the reliability of the study, the sample size should be more representative. Future research can focus on other factors like personal characteristics or social media can be used as a mediator/moderator between new retail marketing model and customer satisfaction. Last but not least, different sectors can be used for similar kind of study.

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SOFT SKILLS AND GRADUATES'EMPLOYABILITY IN THE 21ST CENTURY FROM EMPLOYERS' PERSPECTIVES: A REVIEW OF LITERATURE

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ABSTRACT

Enhancing one's employability or upgrading one's skills is a significant purpose of Human Resource Development. Personal circumstances, individual variables, and environmental influences all play a role in the employability construct. The purpose of this paper is to investigate soft skills and employability from employers' perspectives. Organizations consider human capital critical to their success and usually make efforts to hire the best possible individuals. They usually prefer recruiting employees who possess a fine-quality combination soft skill; highly required by employers. Employers nowadays are seeking graduates who have both academic qualifications and are highly skilled. It is also important to mention that employers are placing a high value on soft skills. Thus, there is an increasing need for a better understanding of the importance of graduates' soft skills required with the increasing demands from employers. Higher education institutions must understand what employers want from their graduates. Hence, employers' perspective towards soft skills is important. Soft skills must be acquired and developed during students' life for them to do effectively in both their academic and have qualities that improve future employability. This paper is based on information collected from different published papers, internet sources and newspapers, it represents a review of the literature in an attempt to answer several questions about the relationship between soft skills and employability in the 21st century. In concludes that soft skills is a strong predictor to enhance employability among graduates in today's dynamic demanding global work environment.

Keywords:
Employability, Soft skills, Employment skills, Employment, Graduate employment, Employers

INTRODUCTION

The job market today is a dynamic and challenging sphere for young people graduating from various educational institutions; the job opportunities are more for graduates who possess employability skills that are expected at workplaces. But only about 30% of the candidates who appear for interviews get selected (Nisha & Rajasekaran, 2018) and one of the main reasons is due to lack of proficiency in English and the employable skills necessary for professionals today. Hence, higher education institutions need to equip graduating students with the skills essential for the workplace; as it has become an urgent concern (Cimatti, 2016). In this context, several nations throughout the world have expanded their focus on skill development, as to prepare graduates for the world of employability as required by employers (Abelha, Fernandes, Mesquita, Seabra & Oliveira, 2020).

Many researchers have defined employability from several perspectives and on what it means to all who are concerned with this term: employers, higher education institutions and graduates themselves (Natalia et al., 2015; Osmani et al., 2015; Sung et al., 2013). The term employability is a multidimensional concept and is used in contexts of transferable, generic, intellectual, interpersonal, industry-specific, and cognitive skills. Despite the lack of a commonly recognized definition, broadly defined, employability refers to a specific set of skills and personal attributes that will assist an individual in securing a job, retaining employment whilst staying relevant within the labour market (Romgens, 2019). Soft skills are career attributes, which are difficult to both master and measure, such as the capacity to communicate, solve problems, teamwork skills, leadership skills, time

management skills, etc. Today soft skills are popularly referred to as employability skill (Patacsil & Tablatin, 2017).

Employers deem soft skills as employability skills owing to the fact they are needed to have a harmonious relationship with co-workers and customers. An employee's job performance and career success are contingent on the effective utilization of soft skills (Nusrat & Naz 2016). Truong and Laura (2015) opined that the development of soft skill as an academic discipline is still under development, and that's why different researchers defined it differently. Advocates such as Truong and Laura (2015) defined personal skills such as the capacity to communicate, and problem-solve, and possess leadership qualities, motivation and the ability to work well in a team. No one factor alone can determine the employability of a person. It's a consequence of a number of factors acting together but according to several researchers such as Fogleman (2019) soft skills like teamwork, communication, leadership and critical thinking are widely required by employers, and when companies hire new personnel, these "skills" should rank as high as technical skills. The objectives of the paper are to examine the soft skills and employability of an individual, to look into various studies related to soft skills and employability and to explore how soft skills could be a strong determinant to the employability among our potential graduates from employers' perspective.

PROBLEM STATEMENT

Despite the increasing demand of the labour market, employers still seem to have difficulty in filling several vacancies because of the claim that majority of higher education (HE) graduates are not employable and lack skills (Okolie and Asfa, 2017). In certain cases, some companies are even emphasizing more on soft skills instead of hard skills (Ramlan & Ngah, 2015). University students have been lacking certain skills such as soft skills especially problem solving and communication skills, difficulty in applying knowledge, and lack of English communication skills (Azmi, Hashim & Yosuff , 2018). Employers deem soft skills as employability skills while blaming higher education for not equipping graduates with the skills needed, and continuously highlighting students' lack of soft skills (Hurrell, 2016) which are needed for today's rapidly changing work environment. The research questions that guided this study focused on soft skills and employability from employers' perspectives in order to explore importance of soft skills to employability enhancement.

Research objectives in this study are to: (i) investigate soft skills and employability from employers' perspectives (ii) determine the relationship between soft skills and employability in the 21st century and (iii) explore how soft skills can be a major predictor of employability.

Research questions in this study are :(i) What are soft skills and employability from employers' perspectives? (ii)What is the relationship between soft skills and employability in the 21st century? (iii) Will soft skills be considered a major predictor of employability?

LITERATURE REVIEW

This review paper focuses on "employability" and its associations to "soft skills" from related past studies and the extent of employability and soft skills from employers' perspective.

Employability

Many different definitions of graduate employability exist (Williams et al., 2015) and one commonly used to describe employability is a set of achievements, skills, understandings and personal attributes

that makes graduates more likely to gain employment and be successful in their chosen occupations (Romgens et al., 2019). The earlier definition of employability emphasized the ability of graduates to obtain a job which used the simple measure of testing whether a graduate had obtained a job within six months of leaving university (Asiri et al., 2017). The Canadian Labour Force Development Board (CLFDB) revealed that employability is"the ability of individuals to gain valuable employment in the interaction with the labour market". Paying more attention to employability at work which is aligned with the International Labour Organization (ILO) termed employability as "the ability to make progress at work and to react to changes in work (Li & Sun, 2019)

The notion of employability has gotten a lot of attention in the literature, but it still needs more research (Hooley et al., 2017). Despite variations in definitions of 'employability' common ground can be found as mentioned earlier by Wharton et al., (2014). The term 'employability' refers to the competences and abilities that graduates must have in order to improve their employment chances in the labour market as well as the country's economic and social growth (Jeswani, 2016; Phago & Thwala, 2015). Sutil & Otamendi (2021) reemphasized and pointed that employability is the capability to move self-sufficiently within the labour market to realise potential through sustainable employment. For the individuals, employability depends on the knowledge, skills and attitudes they possess, the way they use those assets and present them to employers and the context for example personal circumstances and labour market environment within which they seek work. Rothwell & Rothwell (2017) highlighted that employability has the capacity to move oneself to an adequate degree with the labour market to realise potential through prospective employment which depends on the knowledge, skills and attitudes. Behle (2020) termed employability as the ability to find, keep and progress in graduate employment. This was confirmed by Koenelakis & Petrakaki (2020) who believed that employability is a collection of accomplishments – skills, understandings, and personal characteristics – that makes graduates more likely to obtain employment and succeed in their chosen vocations, benefiting themselves, the workforce, the community, and the economy.

However, Hlavackova et al. (2016) found that the employability of an individual is the capacity to adapt to professional demands and current dynamics of new labour markets, and it is directly related to the ability to find and maintain employment. While Hooley (2017) advocated that employability is a multifaceted concept that has both internal and external facets. Apart from its multifaceted employability, the latter encompasses academic performance, career management skills and labour market awareness. Coetzee & Schreuder (2017) measured employability in terms of a person's ability and willingness to become and stay desirable in the labour market, as well as their aptitude to succeed in a variety of occupations; Coetzee added that graduates' ability to find, create, and maintain satisfying work, as well as having the information, understanding, abilities, experience, and personal characteristics to move self-sufficiently within the labour market. Realising one's potential through long-term, rewarding working experience and having skills or knowledge that permit a person more likely to secure a job in which they can be satisfied and successful (Coetzee & Schreuder, 2017).

Recently, findings revealed that graduate employability include graduates' capacity to find work in the labour market, as well as their ability to engage in and contribute to the knowledge economy by using what they learned in higher education, while also improving their social status and the economy of their nation (Majid et al., 2020). More importantly, Balangen et al. (2021) found that employability not only involved one's capacity to find and retain a satisfying job but also employability in a broader sense is the ability to move independently within the labour market in order to realise one's potential through sustainable employment. The extent to which employers' perspectives related to soft skills are discussed is as follows:

Soft Skills

Over the last decades, research has largely focused on the hard skills and recognize how they are required by the labour market (Balcar, 2016);only limited attention has been devoted to the investigation of soft skills (Ciappei & Cinque, 2014). It has been argued that, in order to achieve a positional advantage, graduates need to develop and acquire a combination of hard skills and soft skills (Clarke, 2017). Many organizations recognize the fact that the technical skills of their employees are not enough to achieve the organization's goals, this is why employers of many industries consider soft skills critical for business success (Stewart et al., 2016).

The function of a higher learning institution is not only to train a selected elite group of school leavers, but to offer a focused educational experience this includes providing students the required knowledge and skills to pursue their respective careers (Ramalu et al., 2013) however, many academics and researchers agree that there is an increasing gap between soft skills expected by employers and the level of soft skills possessed by graduates (Singh & Jaykumar, 2019). Soft skills are difficult to measure and evaluate comparing to hard skills (Abujbara & Worley, 2018) but employers usually prefer to recruit an individual who possesses soft skills in addition to hard skills (Maclachlan, 2019). Later, Majid, Eapen & Aung (2019) pointed that there was evidence that soft skills compete with hard skills in their ability to predict employability. Alongside, Charlton (2019) argued that strengthening soft skills is one of the best investments a graduate can make for a future career. Soft skills necessary at the workplace are communication, problem solving, teamwork, decision making, leadership, critical thinking, time management & creativity (Lavender, 2019). Tracing from several institutions, notably the European Union (EU) and the Organization for Economic Co-operation and Development (OECD) had proposed several titles for Soft Skills through history as shown in Table 1 below. Specific Competences refers to hard skills, whereas Generic Competences refers to soft skills.

Table 1: Different names proposed to define soft skills.

Names proposed to define soft skills	Proposed by
Life skills	World Health Organization WHO (1993)
Transversal skills	Istituto per la formazione e l'orientamento al lavoro ISFOL (1998)
Generic Competences	Tuning project (2000)
Key competencies for a successful life and a well-functioning society	Organization for Economic Co-operationg and Development OECD (2003)
Key competences for lifelong learning	European Union EU (2006)
21st century skills	Ananiadou & Claro (2009)
Transferable skills	RPIC- ViP (2011)
Future work skills	Institute for the Future IFTF (2010)
Soft Skills for talent	Manpower Group (2014)
Skills for social progress	Organization for Economic Co-operation and Development OECD (2015)

Source: Cinque (2015)

Soft skills are personal attributes that enhance an individual's interactions, job performance and hard skills that tend to be specific to a certain type of task or activity. It also refers to social gracefulness, and fluency in languages, personal habits, friendliness and optimism that mark to varying degrees. Soft skills complement hard skills, which are the technical requirements of a profession. It can also be an important part of the organization especially if the organization is dealing with people face to face (Pachauri & Yadav, 2014).Similarly, soft skills help people to adapt and

behave positively so that they can deal with the challenges of their everyday life. In this instance, soft skills relate to a considerable range of interpersonal and social qualities and competences, transferable across economic sectors and industries (Hurrell, 2016; Deloitte Access Economics, 2017).

Soft skills development among students is essential for finding a job. Employers mostly look for few specific soft skills during hiring new employees which include creativity, leadership, critical thinking, communication, time management, teamwork, problem solving, etc. (Patacsil & Tablatin, 2017). The importance of these soft skills relies on considering them an important part of the employability skills and knowing the definition of each of them will ease the learning process of each skill as mentioned by many scholars as shown in Table 2 below:

Table 2: Soft Employability Skills

Skills	Definition
Communication skill/ foreign language	Understanding and performing in a language different from the mother tongue. It is the skill that helps transmitting information and common understanding from one person to another. Good communication skill requires knowledge and understanding of social and cultural factors in a situation.
Problem solving	Engaging in the action or thoughts necessary to find solution to a difficult of complex question or situation and resolve conceptual problems.
Leadership	The ability to motivate and positively influence others to achieve goals. It is a behaviour, role relationship, influence and interaction patterns. Graduates should develop and lead individual or team activities, addressing challenging situations.
Critical thinking	Gathering, analysing and articulating information from different sources for solving problems and making decisions.
Creativity	Thinking outside the box in order to bring new ideas to solve problems.
Decision making	Thinking of several choices, relevant information and predicting the consequences.
Teamwork	Involves a set of interdependent activities performed by individuals who collaborate toward a common goal.
Time Management	The process of planning and exercising conscious control of the time spent on specific activities to work smarter than harder.

Source: Amirrudin & Salleh (2016)/ Ornellas et al.(2018)/ Shivoro et al. (2017)/ Kashyap (2019)/ Sanyal & Hisam (2018)/ Li et al. (2019)

Employers' Perspective

The increasing problem of graduate unemployment has been linked to the low level of graduate competency and quality of graduates that do not match with employers' expectations (Perera et al., 2017). In addition, employers have continuously provided feedback that the graduates lack English language proficiency, communication skills, analytical skills, and critical thinking (Nadarajah, 2021). The lack of soft skills has a negative impact on company outcomes such as employee behaviour, safety, engagement, and productivity. Companies are competing on the basis of employee expertise, which has increased the value of soft skills (Borghans et al., 2014). Some critics argue that in today's ever-changing economic environment, graduates from higher education institutions are unable to meet employers' expectations and relevant job requirements (Kahirol et al., 2016; Rohani et al., 2016).

From the perspective of employers, employability often seems to refer to work readiness, that is, possession of the skills, knowledge, attitudes and commercial understanding that will enable fresh graduates to make productive contributions to organizational objectives soon after commencing employment. The employability mismatch was mentioned in Ismail, Chick and Hemdi (2020) where it was revealed that lack of development in the acquisition of "soft skills" contributes to the gap in graduate employability. Employers seek applicants with capabilities and skills appropriate for the work environment (Jeswani, 2016). Consequently, findings suggest the need for future development of current soft skills. The analysis identified "weakness in English language proficiency" as one of the primary factors that led to unemployability. A research brief reported by Hart Research Associates (2013) on behalf of the American Association of colleges and universities indicated that employers want graduates who possess soft skills such as critical thinking, problem solving and communication and according to another survey conducted by the Association of American Colleges and Universities, there is a disconnect between how higher education institutions prepare its scholars to believe in their chosen field and how employers view graduates' preparation. As per the findings of this survey, current university graduates are well prepared in written and oral communication, innovation, complex problem-solving, critical thinking and analytic reasoning, and applying their knowledge and skills to real-world settings, as judged by about a quarter of the employers surveyed. However, more than 60% of graduates believe they are well equipped in these soft skills, according to the findings. This finding emphasises the need for tertiary education to develop new and active techniques for measuring and communicating their graduates' achievements. Employers have stated that they require an understanding of soft skills, and higher education institutions must understand what employers want from their graduates (Kruger, 2015). A study by Messum et al. (2016) examined the required employability skills of new graduates in Australia and findings revealed that soft skills are among the required skills.

Apart from employers who require graduates to have the hard skills necessary for their specific professions (Low et al., 2016); soft skills, on the other hand, have been shown to be more significant in studies since they have received more emphasis in organisations and are in higher demand by employers (Dunbar et al., 2016; Kahirol et al., 2016; Stewart et al., 2016). In the same vein, this was supported by Ali et al. (2017) who reported that employers are placing a high value on graduate soft skills. Conversely, unemployed graduates as mentioned by employers are found to be lacking in various employability soft skills and knowledge such as communication and problem-solving skills (Omar & Rajoo, 2016). Similarly, employers are saying that fresh graduates are unhirable because they lack the requisite skills required for the job (Ejiwale, 2014). This led to the need to investigate deeply the relationship between soft skills and employability.

Soft Skills and Employability

Today, soft skills are some of the most in-demand skills in any workplace. Recently, educational researchers and employers have placed increasing attention on the importance of knowledge or also known as soft skills as evidence suggests that soft skills are an important predictor in employability (Nazron et al., 2017). This was further confirmed by Vanitha & Jaganathan (2019) found that graduates with skills like positive attitude, effective communication, problem solving, time management, team spirit, self-confidence, handling criticism and flexibility which are known as soft skills as a whole have much better chances of survival in the tough corporate world compared to those who are lacking in soft skills and that employability skills are very essential in the current global job market; LinkedIn recently analysed hiring trends across its platform to determine the most sought-after skills. Data suggest that a range of soft skills, including, communication, problem solving, time management and creativity, are the most required among employers (LinkedIn Global Talen Trends, 2019) and highly sought after.

Hart Research Associates (2015) reported that 91 percent of companies believe that a potential employee's critical thinking, communication, and problem-solving talents are more essential than their college major. Advocates such as Matteson et al. (2016) emphasized the importance of soft

skills as an interchangeable skill related to any occupation and sector. Soft skills have been proven to be important in a variety of fields, including management, IT, education, administration, hospitality, medicine, and pharmacy. The importance of instilling soft skills into graduates has grown in recent years as the use of soft skills in the workplace has gotten a lot of attention (Assan & Nalutaaya, 2018). The Canadian Education and Research Institute for Counselling's "National Business Survey" on 500 employers based on the requirement of soft skills at work suggest a number of soft skills based on occupation and profession, concluded that communication skills, teamwork skills and time management are just a few of the many skills that employers consider important for employability (Valdez, 2015).

Among these soft skills include communication, creativity, problem-solving and teamwork. These attributes represent core skills that support an individual's ability to acquire and maintain a job. Communication soft skills serve as a tool to engage in conversations with colleagues and relate expectations and according to studies, "communication should be viewed as a transaction in which participants construct meaning together in a trusting environment (Uzun & Ayik, 2017). Employers desire individuals with strong soft skills to foster a positive working environment and enable them to interact effectively while maintaining control (Matteson et al., 2016). On the other hand, a well-functioning team is a valuable asset to any company. Indeed, a successful team has the capacity to take on more complicated tasks and smooths the process of communication by offering better space for free discussion and collaboration among team members, therefore improving the productivity of not just the team but also the company as a whole (Tripathy, 2018). This was confirmed by Sousa & Rocha (2017) who asserted that the most important soft skills potential employees require to operate successfully at work include leadership and team management skills, and the ability to manage time. Similarly, good and efficient time management is a key skill, a professional skill required to function well in our current jobs and to advance our chances for employment (Forsyth, 2019). Additionally, critical thinking appears to be a crucial soft skill for a variety of organisations. Which is now recognised as a crucial component of employment success (Zuo et al., 2018). Tripathy (2019) asserted that soft skills training has become essential for increasing one's ability to work more effectively, maximise job performance, and advance in one's employment.

In today's increasingly competitive world, mastering soft skills will not only help an employee stand out from the crowd, but will also improve relationships, work performance, and employability development. Recent evidence suggests that soft skills are as productive as professional skills (Balcar et al., 2019). Similarly, Monster (2019) has also researched this topic and goes even further: 85% of recruiters involved in their study has taken in account the importance of soft skills during the process of recruitment and employment. Before hiring new employees, recruiters in general like to see a fine blend of soft skills and competencies among the job candidates in addition to discipline-based knowledge and skills.

Oussi & Klibi (2017) conducted research in Tunisia with a sample of 180 students and the study found a significant relationship between communication skills and employment. Similarly, Vyas (2019) research study clearly indicates that soft skills are vital requirements and in demand by hiring organizations. The latter stated the need to be found within business management students for a better career and that some of the soft skills required by employers are communication skills, leadership skills, analytical thinking skills, teamwork skills and problem solving skills, he also stated that employment opportunities increase when students have soft skills and it increases opportunities to develop a career in a new direction as well as giving the confidence to crack interviews and present themselves in a better way. Nusrat and Sultana (2019) identified desired soft skills frequently asked by recruiters for graduates to sustain employment, study was in Bangladesh using a quantitative approach and found that there is a positive correlation between soft skills and employment.

Gerhardt (2019) conducted a research project in London and used qualitative study on a sample of five group leaders among students, Gerhardt stated that the research serves as an intervention between students' leadership skills and their confidence in employment. His study

hypothesized that leadership skills would positively affect employment among graduates. Also Kelly (2017) conducted research project in Australia using a qualitative method as well and a sample of 100 students in the university and found that leadership is one of the critical skills for students to be employed. On the other hand, Gerhardt (2019) stated that proficiency of soft skills is important towards employability, which he conducted research project in Tanzania using a quantitative approach. The respondents were final year students of bachelor degree and postgraduate students as well and results showed a positive relationship between teamwork skills and employment. However, employers often find soft skills deficiency among the job applicants (Johnson, 2016; Roos et al., 2016). Therefore, soft skills have become one of the needed criteria while hiring employees. Since soft skills help one to get and keep employment as well as successfully influence and lead others at work (Rao, 2018).

METHODOLOGY

This article is based on information collected from different published papers, internet sources and newspapers, it represents a review of the literature in attempt to determine the relationship between soft skills and employability and the importance soft skills from employers' perspective.

The conceptual framework was based on previous studies. Specifically:

- Soft skills are an appropriate approach for enhancing employability (Rahmat et el., 2017; Singh et al., 2017).
- Successful implementation of soft skills leads to improvement of employability (Hamid et al., 2014).

The dependent variable (DV) in this study is employability. The independent variable is soft skills with its dimensions of communication skill, problem solving, leadership, critical thinking, creativity, decision making, teamwork and time management .These soft skills are important in enhancing employability (Vanitha & Jaganathan, 2019; Uzun & Ayik, 2017; Oussi & Klibi, 2017; Kelly, 2017).

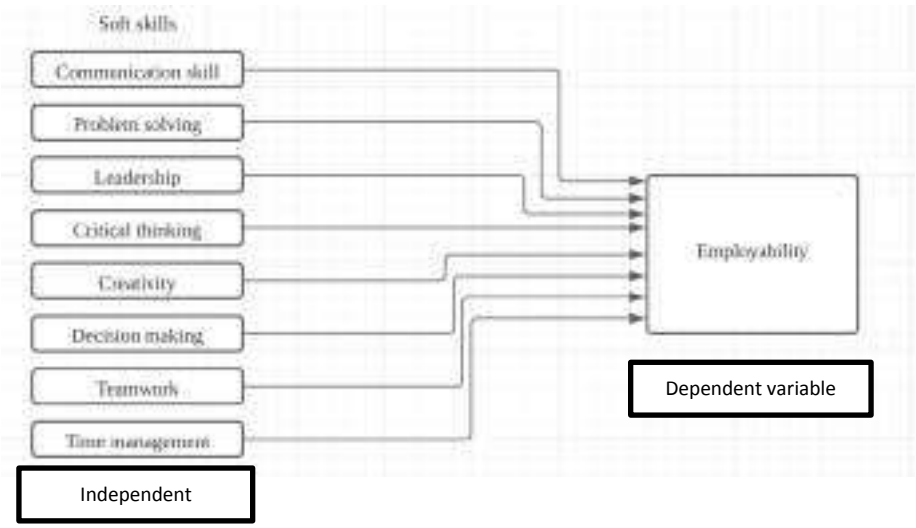

Figure 1: The Conceptual Framework of Soft Skills and Graduates' Employability: Employers' Perspectives

FINDING AND DISCUSSION

Based on the review of the existing literature there is no scientific consensus on the definitions nor concepts of soft skills in pedagogical theory despite its widespread use. Soft skills are regarded as traits (Khanna, 2015), behavioural or interpersonal skills (Nathan, & Rajamanoharane, 2016), non-technical competencies (Stewart et al., 2016), interpersonal qualities (Robles, 2012), non-technical or non-domain skills (Kaushik, & Bansal, 2015), nontechnical traits and behaviours (Klaus et al., 2007), a habit (Khanna, 2015), personal characteristics (Gruzdev et al., 2018) or personal attributes (Robles, 2012; Sousa, & Rocha, 2017), an ability to work in different working environments (Labzina et al., 2019). Hard skills aid in the acquisition of employment, whereas soft skills aid in the retention of employment. As a result, it is critical to combine hard and soft skills in order to advance quickly in one's profession.

Employers require graduates to have the hard skills necessary for their specific professions (Low et al., 2016). However, beyond that, soft skills which have been known as the 21st century skills are largely centred on "deeper learning" skills such as critical thinking, problem solving and teamwork are made of a combination of soft skills and studies have found that those soft skills are more important because it has been receiving greater attention in organisations and are in higher demand by employers (Dunbar et al., 2016; Kahirol et al., 2016; Stewart et al., 2016) and as was mentioned by Cimatti (2016) it can be presumed that the assessment of soft skills during the academic years is challenging. However, more importantly, students need to develop their soft skills before entering the work environment. On the other hand, since its inception in 2011, much has been stated in the fourth industrial revolution (IR 4.0). Among skills that have been labelled in IR 4.0 include skills and competencies such as soft skills, communication, creativity, and problem solving, which are commonly referred to as 21st-century skills (Chaka, 2020), also among the vital skills for IR4.0 necessary for employability. In turn, the availability of necessary skills and competences in a country's workforce will have a considerable impact on the micro-and macro-level adoption of Industry 4.0. Furthermore, the workforce's skills and qualifications will play a significant role in fostering organisational innovation and competitiveness (Benesova & Tupa, 2017; Mavrikios, Georgoulias & Chryssolouris, 2018). Lacking the necessary skill set, on the other hand, will result in a notable reduction in performance and reduced competitiveness in organisations. However, according to Schallock, Rybski, Jochem, and Kohl (2018). Apart from IR 4.0 focusing more about technology growth; it cannot be denied that soft skills requires a focus on human resource development, which includes the development of future-oriented skills. Unemployment is one of the most pressing issues in developing nations, with causes such as a mismatch between available skills and industry requirements; a high proportion of unskilled labour, and insufficient education all contributing to high unemployment (Nazron et al., 2017). Soft skills have been in higher demand by employers. Thus, soft skills are an important predictor for employability in todays' competitive labour market (Nazron et al., 2017).

CONCLUSION

This paper aims to establish a significant contribution of various aspects of soft skills in employability by looking at various literature in the relevant area and it seems that soft skills to be a major predictor of employability in most situations as pointed out by Naim (2017) that communication skill, critical thinking and problem-solving ability are crucial to develop for an employee to become skilled professional and employable. Hard skills help with finding employment, whereas soft skills help people keep their jobs. As a result, in order to grow rapidly in one's work, it is necessary to combine hard and soft skills.

Soft skills training, according to experts, should begin while a person is a student in order for them to do well in both their academic and future job environments (Penratanahiran & Thongkam, 2021). This study could assist the higher education and students themselves in preparing students with soft skills to meet the requirements of the employers. A major scope the paper put forwards is the need for empirical proof for the importance of soft skills to employability from students' perspective as it is important to investigate the reasons behind students and graduates lacking soft skills required by the employers in the current labour market.

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A HISTORICAL OVERVIEW OF THE ABSTRACT SKETCH MODULE OF ABSTRACT ART LANGUAGE COURSES FOR PAINTING MAJORS COLLEGES AND UNIVERSITIES IN CHINA

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ABSTRACT

The scope of professional definition of this research is the painting major numbered 130402 in the Undergraduate Professional Catalogue of General Colleges and Universities issued by the Ministry of Education of China in 2021. Painting majors include oil paintings, murals Printmaking and many other types of paintings. Prior to this, the majors of Chinese universities were called painting major, Mural Painting major, Printmaking major, etc.According to the new regulations of the Ministry of Education of China, the above old majors have been merged into the painting major.The title of the course in this study comes from the Decision of the Ministry of Education on Approving the 2018 National Teaching Achievement Award Projects issued by the text number: Teacher [2018] No. 21.In 2018, the second prize of the National Teaching Achievement Award issued by the Ministry of Education of China to the Sichuan Academy of Fine Arts. This award is the highest award given by the Ministry of Education of China for curriculum research in this field in recent years. Therefore, starting from 2018, most of the university courses in China have adopted the name of the course of Sichuan Academy of Fine Arts-Abstract Art Language.In China, abstract art language courses generally consist of abstract sketch modules and abstract color modules. This research mainly focuses on the abstract sketch module. Prior to this, some colleges and universities called this course abstract art language course, and some colleges called it basic sketch II course. According to the provisions of the General University Undergraduate Major Catalog and Major Introduction compiled by the Higher Education Department of the Ministry of Education of the People's Republic of China, the abstract art language course is one of the core courses of the painting major.In order to ensure the objectivity of this study, the selected documents in this study come from three sources. First, some of the documents come from China's national publishing house or "China's Top 100 Book Publishing Units". Second, the authors of some of the documents come from leading figures in the discipline in China. Third, part of the literature comes from master and doctoral theses of key universities in China.This research has been conducted in three aspects.First, explore the reasons and historical background of the abstract art language courses of Chinese universities lagging behind the Chinese realism painting courses.Second,explore the relationship between the abstract art language course of Chinese painting major and Chinese calligraphy.Third,explore the current status of mainstream teaching methods of abstract sketching module used in abstract art language courses in China at this stage. This research adopts the literature method to study it. A total of 57 related literatures are collected, and the three questions of the research are answered well..

Keywords:
Higher Education in China, painting major， abstract art language course， Traditional Chinese calligraphy teaching method， History development

INTRODUCTION

The art of painting itself is not static, and our understanding of the development of painting art cannot be a one-off. The process of sorting out the development context of painting education is a process of rethinking and re-learning. The vitality of art is inseparable from people's repeated scrutiny of it. ((C. Wang, 2021)Xu Beihong, the founder of contemporary art education in China, believes that sketching is the foundation of all paintings (C. Xiao, 2021). It can be seen the importance of sketching to many kinds of paintings such as oil painting. The abstract art language course for painting majors in Chinese

universities is one of the core courses stipulated by the Ministry of Education of China (Department of Higher Education, 2012). Western countries have accumulated nearly a hundred years of history for this course. For Chinese universities at this stage, the course started relatively late. In order to explore the future development path of abstract art language courses for painting majors, it is essential to study the historical development background of abstract painting education in China (Liao, 2017).

This research focuses on the following three questions: First, what are the reasons and historical background for the abstract art language courses of Chinese universities lagging behind the Chinese realism painting courses? Second, what is the relationship between abstract art language courses and Chinese calligraphy in painting majors in Chinese universities? Third, what is the current status of mainstream teaching methods for the sketch module of abstract art language courses in Chinese universities?

The purpose of this research is to try to achieve the following three objectives.
First, explore the reasons and historical background of the abstract art language courses of Chinese universities lagging behind the Chinese realism painting courses. Second, explore the relationship between the abstract art language course of Chinese painting major and Chinese calligraphy. Third, explore the current status of mainstream teaching methods of abstract sketching module used in abstract art language courses in China at this stage.

METHODOLOGY

The methodology of this research is a systematic literature review, and a total of 54 articles are collected. In order to ensure the objectivity of this research, the selected literature for this research comes from three aspects.

First, part of the literature selection comes from China's national publishing houses, and the "China Top 100 Book Publishing Units" are preferred among the national publishing houses.

According to China's publishing standards, there are two levels of publication distribution, one is a national publication and the other is a provincial publication. The authority of national-level publications is better than that of provincial-level publications. In accordance with the spirit of the "Measures for the Grade Evaluation of China's Commercial Book Publishing Units" and the "Notice on China's First Grade Evaluation of Commercial Book Publishing Units", the China Press and Publication Administration's Commercial Book Publishing Unit Grade Evaluation Office has been rated for the first time 100 first-level book publishing units awarded the honorary title of "National Top 100 Book Publishing Units". This is the only rating activity for publishing houses in contemporary China (Information on: http://www.nppa.gov.cn/nppa/index.shtml). This represents the highest level of China's publishing industry.

Second, part of the literature comes from monographs published by leading figures in this discipline in China. The leading figures of this subject in China referred to by this research institute refer to those who are leaders in the disciplines of calligraphy, art history, fine arts and other related fields and have high-level professional titles.

Third, part of the literature comes from master and doctoral theses of key universities in China.

The key universities in China referred to by this research institute refer to China's "double first-class" universities selected by the Ministry of Education of China, the 8 oldest Chinese Academy of Art, and the 6 oldest art academies. These universities can represent the highest level of higher education in China, and their authority is higher than that of ordinary universities.

THE REASON AND HISTORICAL BACKGROUND OF THE ABSTRACT ART LANGUAGE COURSES IN CHINESE UNIVERSITIES LAGGING BEHIND THE CHINESE REALISM PAINTING COURSES

In order to ascertain the development of the abstract art language course of Chinese painting majors, this summary collects a total of 36 documents. Among them, 3 articles are related to Ming Dynasty in China, 2 articles are related to Qing Dynasty in China, 10 articles are related to the Republic of China period, and 21 articles are related to the period of New China.

Judging from the history of the introduction of oil paintings into China, during the Wanli period of the Ming Dynasty, the Italian missionary Li Madou presented tribute objects to the Chinese emperor, including realistic oil paintings such as Statue of God and Mother of God. This is the earliest record of the introduction of oil painting to China (Hou, 2015). In the second year of Chongzhen, the Italian missionary Bi Fangji wrote an article "An Answer to Painting" to explain the techniques of realistic oil painting to the Chinese, but it had little influence at the time (Sullivan, 2014). In the seventh year of Ming Shenzong Wanli, the Spanish Alfaro brought a few oil painting icons to Zhaoqing, Guangdong. Since then, it has opened the prelude to the introduction of Western paintings into Chinese folk (Y. Wang, 2013).

The Italian missionary Lang Shining was the first oil painter to be valued by the Qing emperor in China. According to "Archives of the Qing Dynasty", when he first entered the palace, Lang Shining was ordered by the emperor to teach the basic techniques of Western realistic oil painting to more than a dozen royal officials including Chinese painters Zhang Weibang, Foyan, and Chashiba(Cao, 2020). In the first year of Yongzheng, six people including Bandarisha, Sun Weifeng, and Yongtai continued to stay with Lang Shining for further studies, learning "line drawing" and serving as his assistants (Z. Yang, 2020). From the first year of Qianlong, Lang Shining worked at the Ruyi Pavilion. The court provided him with four apprentices. In the fifth year of Qianlong, the court set up a studio for Lang Shining. The painters included Lang Shining, Wang Youxue, Wang Zhichen, and Zhang. There are more than 20 disciples trained and taught by Lang Shining, including Weibang and Dai Zheng, and they have also been reused (Cao, 2020). His oil painting education in China has achieved certain results.

Figure 1 Paintings by Lang Shining

Judging from the peak period when oil painting was introduced into China: in the tide of "Western painting spreading to the east" that emerged in the late 19th century and early 20th century, the younger generation of Chinese artists have chosen Japan and Europe to study abroad to learn realist oil painting(Y. Wang, 2013). This became the main way for oil painting to be introduced to China during that period. The first person to study oil painting abroad was Li Tiefu, followed by Li Shutong and Feng Gangbai. They all became pioneers in the development of Chinese oil painting (Feng, 2019).

According to statistics, from 1887 to 1937, there were more than 200 foreign students studying art abroad (Huang, 2020). After returning to China, these people either founded art schools or taught realist oil paintings in art schools around the country. The art school became the main position for the spread of oil painting during the Republic of China (Huang, 2020). Through the establishment of an art school, with the help of Western realistic oil painting education methods, to spread the concepts and techniques of oil painting, this was the main way of art education at that time (Zeng, 2018).

The guiding ideology in the field of art during this period is undergoing a historic turning point, which is mainly manifested in Cai Yuanpei's "Aesthetic Education and Saving the Country" thought that has profoundly affected the art world at that time(D. Gao, 2021). In 1927, Cai Yuanpei became the chief of the highest academic and educational institution of the Republic of China. He is determined to promote the idea of "replace religion with aesthetic education", attaches great importance to "aesthetic education", and deeply summarizes the core aesthetic issues involving the words "art", "aesthetic education" and "aesthetic feeling". The goal of aesthetic education is to cultivate a new personality (F. Liu, 2020). This move has profoundly extended the meaning of art education and further promoted the creation of new art schools, organizations, and groups. According to statistics, there are more than 300 art societies at all levels and various types organized by overseas students throughout the country and abroad, which are unique in the history of Chinese art in thousands of years (H. Zhang, 2021).

During the Chinese Anti-Japanese War, the development of art education in Yan'an was the most noticeable. Luxun Academy of Art was the only higher art academy in the Soviet area at that time (Gao, 2020). The educational policy of Lu Xun Academy of Arts clearly stipulates: "Based on the Marxist-Leninist theory and standpoint, on the historical basis of China's new literary movement, construct the new era of literary theory and reality of the Chinese nation, and train a large number of artistic talents suitable for today's Anti-Japanese War needs. Lu Yi has become the bastion and core of the CCP's literature and art policy" (J. Wang, 2019). Lu Xun Academy of Arts takes political theory and literary theory as compulsory courses, emphasizes the transformation of literary and artistic ideology, and attaches importance to the close connection between education and real revolutionary struggle. Under extremely difficult conditions, through short-term training, a group of art backbones have been cultivated. It follows the spirit of Mao Zedong's "Speech at the Yan'an Forum on Literature and Art", actively devotes itself to the life of the grassroots, and engages in art practice activities in the revolutionary struggle line. (Min, 2014). However, due to the limitations of war conditions, they rarely have the opportunity to engage in the education and study of oil painting and Chinese painting. At this stage, the purpose of art education in the Soviet area was mainly to propagate the revolution, and the most common tool for carrying out this propaganda task was the realistic-style woodcut (D. Li, 2021).

After the founding of New China in 1949, the composition of the art world is divided into two parts, one is the painters who originally lived in the Kuomintang-controlled area staying on the mainland, and the other is the painters from the liberated areas (Z. Li, 2021). Among them, the most influential art educator and painter is Xu Beihong (Y. Zhang, 2021). Since 1920, Xu Beihong has been working hard in the field of art education and has achieved fruitful results. After returning from studying in France, he adhered to the realistic college teaching style and gradually formed a set of systematic teaching mode (Shang, 2020). Xu Beihong's school has also received the support of the Chinese Communist Party. After liberation, as a leading figure in the art world, Xu Beihong continued to make great contributions to the development of realistic art education in New China (C. Xiao, 2021).

Figure 2 Xu Beihong's sketches

The development of Chinese art education in the 1950s also had a strong external influence, that is, the Soviet socialist realist art (Hu, 2015). The characteristics of art education in the Soviet Union are mainly the implementation of formal academic training methods, advocating realistic and thematic artistic language and expression techniques, and advocating that art should reflect the actual living conditions of the workers and peasants (J. Chen, 2020). At that time, Chinese art education was mostly copying the existing teaching system of Soviet art academies to the teaching of my country's higher art academies. The most typical example is the Cheschakov teaching method (He, 2020). In the early 1950s, this teaching system was introduced and promoted by the Chinese Ministry of Culture and became an important part of oil painting teaching in Chinese higher art schools. Ceschakov was a famous art educator in the Soviet Union. He once studied in Italy. He established a complete Ceschakov art education system based on materialist aesthetics. Many Russian art masters such as Repin and Su Rikov, Serov, etc. are all his students (Bao, 2019). In teaching, Cheschakov emphasized careful observation of life and nature, giving students a certain amount of learning space and freedom (Yue, 2018). In 1952, after the East China Branch of the Central Academy of Fine Arts and the Soviet Academy of Fine Arts students exchanged sketch assignments, they published Cheschakov's sketch teaching methods and teaching quotations (Ying, 2020). In 1955, the Ministry of Culture convened a national sketch teaching symposium, at which it was decided to further promote Cieschakov's teaching system (Zhong, 2020). Since then, most Chinese art academies have followed Cheschakov's teaching system in terms of curriculum settings, teaching methods, and painting tools, forming a "leaning to one side" teaching situation (He, 2020). Figure 3 is a sketch of a typical Chesschakov teaching system.

Figure 3 Sketch works of Cheschakov's teaching system

For a period of time after the end of the "Cultural Revolution", "reflection" became a characteristic of the ideology at that time. The National Art Education Working Conference was held in Beijing, clearly stipulating that the focus of work should be shifted to teaching. In order to adapt to the development of the new situation, art education was transferred from the recovery stage. Entered into the period of improving teaching quality (Y. Xiao, 2020). In February 1979, the "Trial Program for Teaching of Fine Arts Specialty" and "Trial Program for Teaching of Arts and Crafts Specialty" were issued successively in higher art colleges and universities across the country, which better implemented the laws of art education and the policy of letting a hundred flowers bloom. Under the guidance of the plan, various colleges and universities have flexibly formulated teaching systems and curriculum settings, and there is also a certain space for professional development (Deng, 2019). In December of the same year, the second national seminar on sketch teaching in higher art academies was held. The meeting corrected the administrative method of implementing the Cheschakov sketch system in 1955 and opened up the possibility of other styles of sketch teaching (Yue, 2018). The expression in culture and art is "scar literature and art", and the thematic connotation of art works during this period has undergone profound changes. The most striking force among the members of the "Scar" painting is the 1977 and 1978 students of the Sichuan Academy of Fine Arts. It is history that made these sensitive students the spokesperson of that era. With the advent of the era of reform and opening up, art education has been injected with fresh blood, and a relaxed and diversified atmosphere has gradually formed, but mainstream art is still realist works (Q. Li, 2019).

In the mid-1980s, the development of art disciplines in China entered a period of experimental creation and education, which was most prominently manifested in the teaching and creation of oil paintings (Y. Wu, 2018). The Central Academy of Fine Arts is the only higher art school directly under the Ministry of Education of the People's Republic of China. It was established in April 1950 by the merger of the National Beiping College of Art and the three Departments of Fine Arts of North China University. It is the best art academy in China (Song, 2020). The Central Academy of Fine Arts has added a fourth studio to the original three realistic studios. In 1985, the then director of the oil painting department Wen Lipeng proposed to establish the fourth studio, with Lin Gang as the director and Ge Pengren as the deputy director. The teaching objectives are: taking the modernization of Chinese art as the ideal, modern art education thought as the core, new teaching mechanism as the guarantee, and Chinese painting tradition as the foundation, based on China, facing the world, and developing modern, Chinese and creative The art of oil painting (Information on: https://www.cafa.edu.cn/). In teaching, students are not only required to master the methods and skills of oil painting, but also not to relax the education of innovative thinking for students, so as to cultivate talents with creativity and the ability to explore new knowledge(Ruan, 2019). The studio was presided

over by Professor Yuan Yunsheng from 1997 to 2005, and by Professor Ma Lu since 2005. The studio began to conduct small art teaching experiments in the mid-90s; the purpose is to try new comprehensive creative methods in materials, techniques and concepts (Information on: https://www.cafa.edu.cn/). This means that since the 1990s, the exploration of abstract painting teaching has slowly appeared in China, which belongs to the embryonic period.

In the 1990s, there were also great reforms in the art courses of the major art academies. The overall trends in art education during this period are as follows: First, in the entire art teaching, modern art education has been vigorously promoted, and art education has begun to be closely integrated with the needs of the market and society. Second, the establishment of the new major of art design has impacted the dominant position of realistic painting in college education. At the same time, the basic courses of art design, graphic composition and color composition, also need abstract painting teaching (Zheng, 2018). Under this opportunity, abstract oil painting has obtained certain development opportunities with the help of the highly practical art design profession without being recognized by the Chinese art market (K. Wang, 2020).

Since 2010, China's abstract oil painting art market has gradually heated up, and the prices of many abstract oil paintings have increased hundreds of times, or even thousands of times (Xin, 2019). Chinese abstract oil painter Zhu Dequn's work was initially only 130,000 Hong Kong dollars, but in 2021, the Sotheby's Hong Kong auction sold a high price of 228 million Hong Kong dollars. In 2018, Chinese abstract artist Zao Wou-ki sold for HK$510 million at Sotheby's Hong Kong auction, becoming the first Asian oil painter (Information on: https://www.sothebys.com/zh-hant/). The recognition of Chinese abstract art in the art market has affected the discipline construction of Chinese universities (Gu, 2019). In 2015, the fifth studio of the Oil Painting Department of the Central Academy of Fine Arts was established. It is the first studio in China with the exploration, research and promotion of abstract art as its teaching direction. Missing (Information on: https://www.cafa.edu.cn/). The teaching goal of the fifth studio is dedicated to the teaching research and practice of abstract art, unifying the spirituality of art with the form and color of plastic art, emphasizing the integration of current Chinese cultural experience, and constructing abstract artistic language expression with Chinese characteristics (G. Liu, 2019).

The above documents show that modern China has always been dominated by realistic oil painting education. It was not until 2015 that China had a special oil painting studio for abstract teaching, less than 6 years ago. In Western countries, the teaching of abstract oil painting has a history of 100 years, and a relatively complete teaching system has been formed. The gap between time and experience has caused the various courses of Chinese abstract oil painting to be relatively backward.

THE RELATIONSHIP BETWEEN ABSTRACT ART LANGUAGE COURSES FOR CHINESE PAINTING MAJORS AND CHINESE CALLIGRAPHY

Many well-known abstract paintings are derived from Western art genres. In 1910, Kandinsky wrote the world's first theoretical work on abstract art "On the Spirit of Art." In the same year, he created the world's first abstract painting. In 1926, he wrote the book "Point, Line, Surface" (C. Wang, 2021). Kandinsky was not only a great abstract painting artist, but also a great educator. The teaching method he created is the undisputed classic representative of the western abstract painting teaching method. However, any abstract painting teaching theory in the West did not consider the acceptance of Chinese people at the beginning. At this stage, Chinese abstract painting education tends to be based on local culture and mixed with Western classic teaching theories(X. Sun, 2019b).

In order to explore the relationship between the abstract art language course of Chinese painting major and Chinese calligraphy, this summary collects a total of 12 documents.

Many well-known abstract oil paintings are derived from Western art genres. In 1910, Kandinsky wrote the world's first theoretical work on abstract art, "On the Spirit of Art." In the same year, he created the world's first abstract oil painting (C. Wang, 2021).

Abstract oil painting is an art form that Chinese oil painting students must learn. The abstract art language course is also one of the core courses stipulated by the Ministry of Education of China (Department of Higher Education, 2012). From the perspective of cognitive learning theory, knowledge is the main content and main result of learning. Whether it is Bruner's cognitive structure learning theory or Ausubel's cognitive assimilation learning theory, they all emphasize the role of cognitive structure, and then the importance of knowledge structure to discover learning, application, problem solving and creation. Both types of learning depend on the students' existing knowledge (X. Wang, 2010).

Kandinsky's teaching theory is derived from Western teaching theories. Many examples in the teaching method involve Western cultural habits and Western classical music. It cannot adapt well to the existing knowledge structure of Chinese students, which creates a bottleneck for students in acquiring new knowledge (X. Sun, 2019a). Therefore, many abstract oil painting teaching methods that try to solve this problem have been derived in China. Among them, the call for teaching Chinese calligraphy into abstract oil painting is the most popular. There are two reasons for this fact.

First, Chinese calligraphy has a good mass foundation (Y. Liu, 2021). In Western countries, it is quite common to appreciate and copy the works of the world's top abstract painters. Students from various art academies can often go to local museums or art galleries to copy and appreciate world-class abstract oil paintings to improve their level. In China, there are almost no world-class original Western abstract paintings displayed as collections in art galleries and museums everywhere (Bai, 2021). Although there are no world-class original Western abstract paintings, museums in various cities in China have excellent calligraphy collections, and students can easily get the nutrition of the original calligraphy (X. Yang, 2017). The use of Chinese calligraphy to guide abstract sketch education has solved the relatively weak learning environment of Chinese students to a certain extent, and China has the best and most complete Chinese calligraphy education system in the world (H. Wu, 2020). The Chinese Ministry of Education has incorporated calligraphy education into the compulsory curriculum of Chinese primary and secondary schools (S. Sun, 2021). The relatively solid foundation of calligraphy can be used as a link between the students' existing knowledge and the various courses of abstract oil painting, which is conducive to the formation of new knowledge.

Second, as a graphic art, calligraphy has a certain degree of abstraction. It is an overall temperament formed by the combination of a large number of subtle details, which determines the style of a font or a calligraphy work (Zhu, 2021). The subtle sensation of flat form and the precise grasp of movement that are cultivated in calligraphy training cannot be replaced by traditional sketch training (L. Chen, 2020). Because calligraphy gets rid of the object image, to a certain extent, the problem of its "image or not" is not to compare the image on paper with the sketch object, but to compare it with the inscription template. Its "likeness" is a kind of iconography research. It can cultivate a kind of image sensitivity very well. The question of "like or not" is directly transformed into the question of "beauty or not" (X. Li, 2020).

Therefore, the sketch module of the abstract art language course in China at this stage is the product of a mixture of traditional Chinese calligraphy teaching method and Kandinsky teaching method. Figure 4 shows the relationship between the various modules of abstract art language courses in Chinese universities. The color part is the focus of this research.

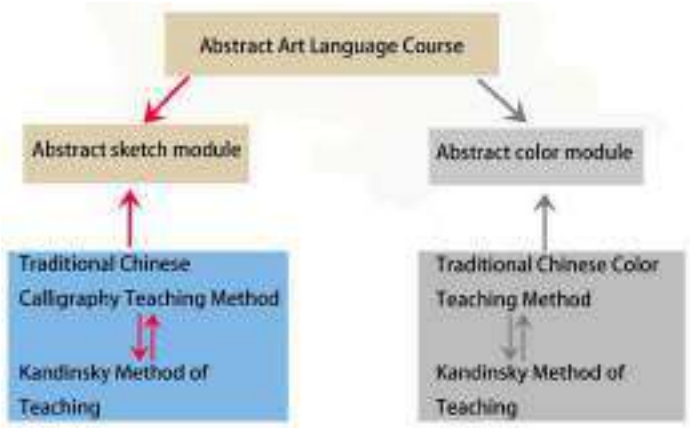

Figure 4 Schematic diagram of abstract art language courses in Chinese universities

CURRENT TRADITIONAL TEACHING METHODS OF ABSTRACT ART LANGUAGE COURSES FOR CHINESE PAINTING MAJORS

In order to explore the current traditional teaching methods of abstract art language courses for Chinese painting majors, this summary collects a total of 9 documents and 76 videos.

In the traditional Chinese calligraphy teaching method, this study selected the highest-level art research unit in China-the China Academy of Arts, the most professional calligraphy social organization in China-the Chinese Calligraphers Association, and the best academy of fine arts in China-the Central Academy of Fine Arts, as the current mainstream Representative of traditional teaching methods. There are several reasons for choosing these three units as representatives of mainstream teaching methods.

First, the Chinese Academy of Art is a national art research institution for art research, art education and art creation directly under the Ministry of Culture of the People's Republic of China. The first-level discipline authorized unit. It is the only national comprehensive academic institution in China that integrates art research, art education and art creation (Q. Chen, 2021).

Second, the Chinese Calligraphers Association is a people's organization of calligraphers from all nationalities led by the Communist Party of China. It is composed of national calligraphers, seal engravers, calligraphy theorists, calligraphy educators, calligraphy activity organizations, and management workers. A national professional organization and a group member of the Chinese Federation of Literary and Art Circles. It is the only national official calligraphy institution in China (Information on: http://www.ccagov.com.cn/).

Third, the Central Academy of Fine Arts is the only higher art school directly under the Ministry of Education of the People's Republic of China. 100 years ago, the National Beijing Academy of Fine Arts, the predecessor of the Central Academy of Fine Arts, was born. The pioneers of modern Chinese art education, with the ideal of "replace religion with aesthetic education", ushered in a new era of Chinese modern art education. It is the best art academy in China (G. Liu, 2019).

Fourth, the teaching methods of these three institutions representing the highest level of research institutions in China have a high appeal. They are a role model for many universities in China.

In this study, one representative was selected from each of the above three institutions as the representative of the traditional teaching method. There are two reasons for this.

First, all three of them are the winners of the Lanting Award, the highest award in Chinese calligraphy. The Lanting Award for Chinese Calligraphy is the only national calligraphy art award approved by

the Central Propaganda Department and the highest professional award for Chinese calligraphy art (Dong, 2021). This guarantees their professionalism and authority in calligraphy teaching methods.

Second, the teaching methods designed by these three people are all for non-calligraphy students to learn, which is in line with the theme of this research. Figure 5 shows the relationship between the three traditional Chinese calligraphy teaching methods and abstract art language courses.

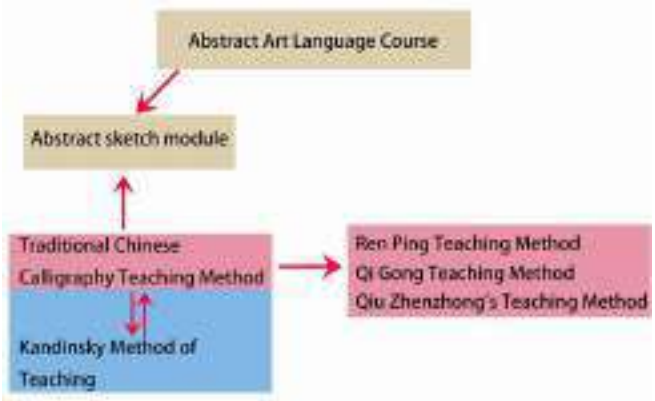

Figure 5 Diagram of the relationship between the three traditional Chinese calligraphy teaching methods and abstract art language courses

The representative of the first tendency is The Story of Calligraphy by Professor Ren Ping of the Chinese Academy of Art published by Zhejiang Literature and Art Publishing House in 2019. The teaching method was started in 1999 and is marked by University Calligraphy published by Xiling Yinshe Publishing House. The first chapter of The Story of Calligraphy, the origin of Chinese characters and the Jiajin script. Chapter Two, Li Bian and the birth of calligraphy (Li Bian means a change in calligraphy style). Chapter Three, Wei Dynasty and Jin Dynasty's demeanor and Lan Ting Ya Ji (Lan Ting Ya Ji means a kind of festival in China). The fourth chapter is about the grand occasion of the book world in the Tang Dynasty. Chapter 5, Song Shang Yi (Song Shang Yi means a calligraphy art pursuit in the Song Dynasty of China) and "Su Mi" (Su Mi refers to two Chinese calligraphy masters) Chapter 6, Yuan and Ming calligraphy circles The retro and change. Chapter Seven, Qing Bei Xue (Qing Bei Xue means that because of the literary prison in the Qing Dynasty in China, many literati took out the inscriptions on the tablets and stones of the Han Dynasty for research). Chapter 8: Writing, Deconstruction, and Escape. The ninth chapter, calligraphy and poetry, essay, tea. Chapter 10, Review of Calligraphy Studies since the Founding of New China(Ren, 2019).Professor Ren Ping believes that calligraphy is an art with deep historical roots, and it is also an art with various modern art elements. Understanding and accepting the artistic thinking and expression methods in calligraphy, in fact, almost entered the palace of modern art (Ren, 2019). From the content of the ten chapters above, it can be seen that the teaching method is explained on the time axis. Therefore, the teaching method emphasizes learning calligraphy in the order of calligraphy history.In this research, we searched for some lecture videos of Professor Ren Ping. These videos were sponsored by China's Zhejiang Newspaper Group and Zhejiang Fine Arts Media Auction Co., Ltd. invested in the construction and operation of art master classes. The record number of the Ministry of Industry and Information Technology of China: Zhejiang ICP No. 17013067-1.These videos include: 150 Cases of Calligraphy by Ren Ping. Teacher Ren Ping chose more than 150 representative Chinese characters to explain to everyone. From the ancient writing method and the current writing method, he used 33-class video lessons to demonstrate the evolution of the five types of calligraphy. It reveals the process of the birth and evolution of Chinese characters. The relationship between calligraphy and characters by Ren Ping, teacher Ren Ping explained the relationship between

calligraphy and characters in 3 class hours. Learning Lu Weizhao's Calligraphy lectured by Ren Ping, teacher Ren Ping used 6 class hours to analyze and explain the case of artist Lu Weizhao. Combine these lecture videos and the monograph published by Professor Ren Ping on the teaching method. This research estimates the various indicators of this teaching method in abstract art language courses.Figure 6 shows that in the abstract art language course, the combination of this teaching method and Kandinsky's teaching method adopts a combination of before and after. It first conducts calligraphy training in the order of calligraphy history, and then Kandinsky's abstract painting training. The proportion of class hours of this teaching method is based on the overall estimation based on the teaching video of Professor Ren Ping and The Story of Calligraphy. This study found that this teaching method accounts for a relatively high proportion of the total class hours of the abstract sketching module. Calculated according to 22 important dynasties in China, a total of 54~66 homework. This is the highest amount of classwork among the three teaching methods.

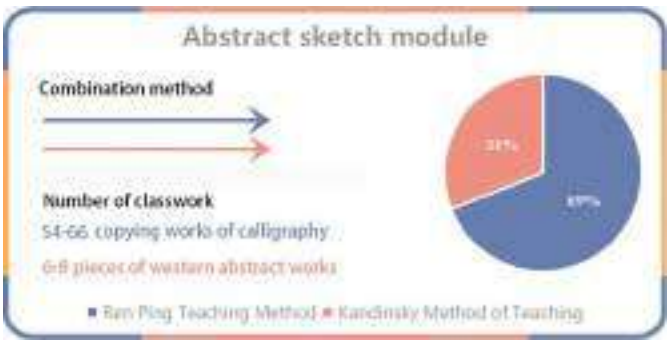

Figure 6 Schematic diagram of estimation of Ren Ping's teaching method and Kandinsky's teaching method

The representative of the second tendency is Qigong Talking about Calligraphy by Professor Qi Gong published by Changjiang Literature and Art Publishing House in 2021. Professor Qi Gong is the honorary chairman of the Chinese Calligraphers Association. The teaching method was started in 2001 and was marked by Qigong Lun Calligraphy published by Cultural Relics Publishing House. Professor Qi Gong has discussed this teaching method in many monographs for more than 20 years. The teaching method abandons the sequence of calligraphy history as each unit of learning, and replaces it with the teacher's own perception and creative experience as the main line of learning. As the author himself said: Calligraphy has always been written, including from ancient times to modern times like Bao Shichen's Yizhou Shuangji, and Kang Youwei's Guangyizhou Shuangji. These seem to be more mysterious, more elegant, and the words used are more ancient and profound. If you actually use the pen according to those words and sentences and practice writing, you will feel that there are many problems, that the words are not expressing the meaning, and you cannot show the real situation. What I am talking about is my usual understanding (Qi, 2020).This research searched for some lecture videos of Professor Qi Gong. These videos were published by Beijing Normal University Audio and Video Publishing House, China Standard Sound Recording Code ISRC CN-A21-09-0011-1/V.G4. These videos include all the explanations of the teaching method given by Professor Qi Gong in 19 class hours. This research estimates the various indicators of this teaching method in abstract art language courses.Figure 7 shows that in the abstract art language course, the combination of this teaching method and Kandinsky's teaching method adopts a combination of before and after. It first conducts calligraphy training according to the personal feelings emphasized by Professor Qi Gong, and then conducts Kandinsky's abstract painting training.The proportion of class hours of this teaching method is estimated as a whole with reference to Professor Qi Gong's teaching video and Qigong Talking about Calligraphy. This study found that the estimated value

occupies a relatively low percentage of the total class hours of the abstract sketching module. The estimation of the amount of classwork is based on Professor Qigong's monograph "Qigong Talking about Calligraphy" combined with the teaching video, a total of 24-28 classwork.

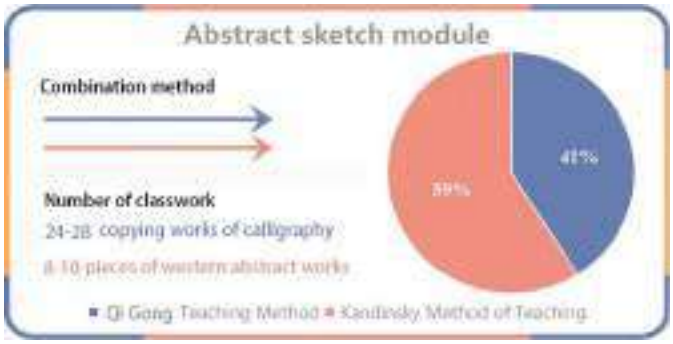

Figure 7 Schematic diagram of the estimation of Qi Gong teaching method and Kandinsky teaching method

The representative of the third tendency is the publication of Calligraphy: A Memorandum on the Knowledge, Concepts and Approaches of Calligraphy by Professor Qiu Zhenzhong by Life. Reading. Xinzhi Sanlian Bookstore in 2021. This teaching method originated in 2011 and is marked by the Seven Questions of Calligraphy published by Renmin University Press of China. The author is the director of the Calligraphy and Painting Comparative Research Center of the Central Academy of Fine Arts (Information on: https://www.cafa.edu.cn/). It is different from many authors who discuss traditional calligraphy teaching methods. The author is an authority who specializes in the combination of calligraphy and painting teaching. It differs from the previous two teaching methods in that this teaching method emphasizes the relationship between calligraphy and abstract paintings, and focuses on comparing the similarities and differences between calligraphy and western abstract paintings (Qiu, 2021).This research searched for some lecture videos of Professor Qiu Zhenzhong. These videos were published by Beijing Normal University Audio and Video Publishing House, China Standard Sound Recording Code ISRC CN-A05-99-0019-0/V.G4. These videos include Professor Qiu Zhenzhong's 15 class hours of all explanations of the teaching method. This research estimates the various indicators of this teaching method in abstract art language courses. Figure 8 shows that in the abstract art language course, the combination of this teaching method and Kandinsky's teaching method adopts an alternate combination. Its calligraphy training and Kandinsky's abstract painting training are carried out alternately. The proportion of class hours of the teaching method is based on the overall estimation based on the teaching video of Professor Qiu Zhenzhong and Calligraphy: A Memorandum of Knowledge, Concepts and Approaches to Calligraphy. This study found that the estimated value is relatively even in the total class hours of the abstract sketching module. The amount of classwork is based on Professor Qiu Zhenzhong's monograph Calligraphy: A Memorandum on the Knowledge, Concepts and Ways of Calligraphy combined with the lecture video, and a total of 32-37 classwork.

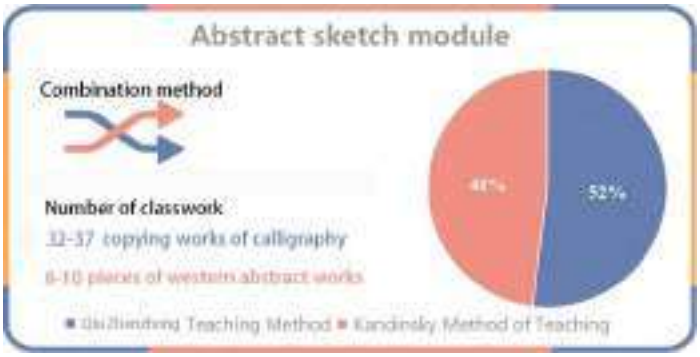

Figure 8 Schematic diagram of the estimation of Qiu Zhenzhong's teaching method and Kandinsky's teaching method

The above three representative teaching methods basically summarize the mainstream combination method of traditional Chinese calligraphy teaching method and Kandinsky's teaching philosophy. The first teaching method is to conduct calligraphy training in the order of Chinese calligraphy history, and then to Kandinsky's abstract painting training. The second teaching method is to conduct calligraphy training according to the personal feelings emphasized by Professor Qi Gong, and then conduct Kandinsky's abstract painting training. The third is the teaching method in which the comprehensive topic of calligraphy and Kandinsky's teaching method are alternately trained.

CONCLUSION

In summary, this research has combed the related fields of abstract art language courses in Chinese universities from three aspects. First, this research started from the timeline when Western paintings began to be introduced into China, and analyzed the reasons and historical backgrounds of the abstract art language courses in Chinese universities lagging behind the Chinese realism painting courses. Second, this research analyzes the reason why Chinese calligraphy is integrated into abstract art language courses and the relationship between Chinese calligraphy and abstract art language courses. Third, this study exemplifies three representative teaching methods of traditional Chinese calligraphy in the sketch module of the current Chinese abstract art language course. Analyzed the method of combining these teaching methods with Kandinsky's teaching method and their respective characteristics.

AUTHORS BIOGRAPHY

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THE LIMITATIONS OF SUBSURFACE FLOW CONSTRUCTED WETLANDS APPLYING IN CITIES IN MALAYSIA

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ABSTRACT

The safety and adequacy of water resources are of vital importance to humanity. With economic and social development, urbanization has accelerated, and the population of townships has continued to rise, increasing the amount of domestic sewage discharged in towns. Although its discharge meets the Grade A standard of the Environmental Quality (Industrial Effluent) Regulations 2009, it is still lower than the Grade IV water in the National Water Quality Standards and belongs to the sewage category. In this study, a qualitative research method is used to investigate the limitations of the application of constructed wetlands in Malaysian cities. This study provides interview data on the views of the two water companies on the application of constructed wetlands to sewage treatment plants. This study finds that land and cost are significant factors restricting the application of constructed wetlands in cities. Therefore, the publication of relevant policies on the comprehensive utilization of water resources may encourage sewage treatment plants to apply tertiary sewage treatment technologies further to purify wastewater.

Keywords:
Constructed Wetlands; Interviews surveys; Sungai Selangor; Sewage treatment plant; tail water; Wastewater

INTRODUCTION

Recently, most rivers in Malaysia have polluted, and 53% classified as polluted (Naubi et al., 2016). The primary pollution sources of the river come from five aspects, namely manufacturing, agricultural industry, sewage treatment plant, pig farm and wet market. Among them, the sewage treatment plant discharges were the highest pollutants into the river on average; released 202 tonnes/day of Biochemical Oxygen Demand pollution load, 303 tonnes/day of Suspended Solids Load pollution load and 162 tonnes/day of Ammoniacal Nitrogen Load were released in 2018 (Goi., 2020). Due to the population of townships, increasing the amount of domestic sewage discharged in towns has continued to rise. The scale of sewage treatment plants is gradually rising (Hanum et al. 2019; Wong et al., 2019). However, its discharge meets the Grade A standard of the Environmental Quality (Industrial Effluent) Regulations 2009; it is still lower than the Grade IV water in the National Water Quality Standards and still belongs to the sewage category. The water quality index has been classified by the Department of Environment (DOE) according to a number of classes, for example, class I, II, III, IV and V. The higher the index value, the higher will be the quality of the water; the lower the index value, the lower the water quality (Mohiyaden et al., 2019). Consequently, it is significant to apply green technology to purify the tail water further (Abood et al., 2017). Corresponding, reclaimed water should be meet the national water quality standard Grade III that satisfy landscape purpose reuse, thereby saving water resources and protecting rivers (Division et al., 2004). Nowadays, treat sewage plant discharges by the subsurface flow constructed wetland become more and more in the world. Moreover, the treatment and recycling of tail water are effective means of mitigating water pollution problems; they can promote the sustainable and renewable development of water resources and is essential for treating effluent from sewage plants (Cheng et al., 2019).

Eutrophication of lakes and water quality deterioration have become a major environmental problem worldwide (Ayele and Atlabachew, 2021; Shaharom et al., 2019). Since the tail water of the sewage treatment plant is lower than the nitrogen and phosphorus discharge standards for surface

water, the tail water is discharged into the river and the water body becomes eutrophication for a short time (Wang., 2020). Generally, the scale of rivers may determine their dilution capacity. Large rivers have a more substantial dilution capacity than small rivers.

Due to human activities, some rivers in Malaysia have been polluted. The quality of the water, which used to be classified as Class II and required only conventional treatment, has now deteriorated to Class III, which requires extensive treatment in the river's middle and lower basin (Huang et al. 2015; Baharudin et al. 2021). Due to the treatment of river pollution, massive investment in the workforce, time and economy. Therefore, it is economical to take measures to prevent river pollution.

LITERATURE REVIEW

According to Liu, Zhang and Xu (2017), the constructed wetland system can serve as a sustainable landscape ecosystem and achieve the purpose of sewage treatment. Recently, the water resources shortage and pollution of the water environment in Malaysia have become increasingly prominent. The reuse of tail water from urban wastewater treatment plants is an effective measure to solve the urban water shortage. The advanced treatment and reuse of the tail water of urban sewage treatment plants for landscape purposes have comprehensive water conservation and environmental protection benefits (Zhu and Dou., 2018). While sewage treatment plants have wastewater treatment capabilities, they do not have ecological service functions. To improve the effluent quality of the sewage treatment plant and meet the Grade III water in the National Water Quality Standards, the sewage treatment plant needs to add advanced treatment processes. The subsurface flow constructed wetlands, as a treatment process with low cost and efficiency pollutants removal, are often used to treat sewage plant tail water (Liao., 2018). However, the current application of constructed wetlands is more widespread in rural areas than in cities. Therefore, it is necessary to discuss the limitations of the application of constructed wetlands in cities from economy, environment and technology.

Based on the research problem and literature review above, therefore this study is to identify and discuss the limitations of the application of subsurface flow constructed wetland in Malaysia.

METHODOLOGY

To measure comprehensible study outcomes, a qualitative study was conducted. The interview has certain advantages, it is relatively economical to implement, and it can obtain rich and detailed information to make it more in-depth to explore the problem. For this reason, the interviews surveys were conducted to investigate the perception about the possibility of subsurface flow constructed wetlands large-scale used in Malaysian cities. Therefore, e-mail interviews were conducted with two companies in March 2021. A corporate communications manager from Pembentungan MMC Langat Sdn Bhd was chosen as an interviewer for this study. The interviewer provided information on the management and operation of sewage treatment plants. A designer from Indah Water Konsortium Sdn Bhd in Malaysia was selected as an interviewee for this research because the interviewee has an in-depth understanding of sewage treatment systems. The purpose of this study is to collect and analyze different perspectives from various industries about the wastewater treatment system of sewage treatment plants and constructed wetland systems. The two sample sizes are considered to collect sufficient information because the two interviewees have extensive experience and participated in design projects. Due to they are involved in the design of wastewater treatment processes and constructed wetland systems, they have a deep understanding of municipal wastewater treatment processes, helping gather in-depth information on research topics.

In the qualitative phase, we analyzed the data through constant comparative method. The findings were linked to the available documents. There are two tables that summarize the key findings of the analysis.

Table 1. Summary of Interview Participants

Interviews	Profession	countries
Pembentungan MMC Langat Sdn Bhd	Corporate communications manager	Malaysia
Indah Water Konsortium Sdn Bhd in Malaysia	Designer	Malaysia

RESULTS AND DISCUSSION

Interview data collected by MMC Pembetungan Langat Sdn Bhd.

Table 2. Summary of Fundings

Respondents	Questions	Fundings
A corporate communications manager	Question 1: What are some of the current issues facing the Langat Centralized Sewage Treatment Plant?	Currently, the Solid Proving Test should be conducted and get Certificate of Completion and Compliance (CCC) from authorities.
	Question 2: What is the current method used in your sewage treatment? What I mean is the technology used. Do the nitrogen and phosphorus of the effluent from the treatment plant meet the Standard A effluent quality?	Typically, Advance Activated Sludge treatment process is used in the sewage treatment plants. Both nitrogen and phosphorus of the effluent from the treatment plant meet Standard A effluent quality.
	Question 3: Could you please tell me what disinfection method is employed in the sewage treatment at this plant?	Chlorination disinfection not have been used to treat effluent because not have planning to recycle for other usage currently.
	Question 4: Do you think constructed wetlands can be effectively used for the advanced treatment of reclaimed water before its discharge into the river?	Effectively constructed wetlands required a large area, which is not practical in at the highly populated areas.
	Question 5: Do you think the undeveloped land in the sewage treatment plant can be developed into an ecological wetland park with deep purification functions?	The application of the ecological wetland park with deep purification function may not be necessary as the sewage treatment plant's effluent is meet the Standard A Environment Quality (Sewage) Regulation 2009.

Interview data collected by Indah Water Konsortium Sdn Bhd

Table 2. Summary of Fundings

Respondents	Questions	Fundings
A designer	Question 1: What are some of the current issues facing the Sewage Treatment Plant?	Some of the older treatment plants are also not designed to meet the latest DOE standards.
	Question 2: What is the current method used in your sewage treatment? What I mean is the technology used.	Currently, the Activated Sludge treatment process is used, namely Extended Aeration and Sequential Batch Reactor.
	Question 3: Do you think constructed wetlands can be effectively used for the advanced treatment of reclaimed water before its discharge into the river?	Although the constructed wetland may help to further polish the effluent to better quality, the overall life cycle cost of the system would need to be evaluated to ascertain if it is effective.
	Question 4: Could you give some of your views on the current status and future development of the sewage treatment process?	Currently, most sewage plants not have fitted with constructed wetlands. However, it would be a welcome move if the government or developer who constructs the sewage plant consider this option that will benefit all in terms of addressing the effluent quality and recreational value.
	Question 5: Do you think the undeveloped land in the sewage treatment plant can be developed into an ecological wetland park with deep purification functions?	Generally, most sewage plants' land areas are given based on the stipulated land requirement in Malaysia Sewerage Industrial Guidelines (MSIG) Volume 4 which is based on sizing needs of sewage treatment processes and hence, may not be sufficient for additional space (undeveloped land) for the constructed wetlands.

Both Respondents from interview data were collected by Indah Water Konsortium Sdn Bhd (Respondent A) and MMC Pembetungan Langat Sdn Bhd (Respondent B) were felt that more research and development are needed before the application of constructed wetlands in cities.

Indah Water Konsortium Sdn Bhd served more than 25 million population equivalent, operate and maintain more than 7,000 sewage treatment plants and around 20,000 km underground sewage pipelines. Respondent B believed that a modern and efficient sewage treatment system is essential to ensure that wastewater is treated before it is discharged into the river to help protect the country's water resources, protect public health and provide a cleaner and safer environment. The respondent reports that most sewage treatment plants use Activated Sludge treatment process, named Extended

Aeration and Sequential Batch Reactor. Generally, the sewage treatment stage is divided into primary treatment and secondary treatment. Currently, there is no tertiary treatment in the sewage treatment plant. The tertiary treatment is to purify the wastewater further to achieve high water quality standards and reuse reclaimed water. Therefore, most sewage treatment plants have not realized comprehensive utilization of water resources.

Several considerations may limit the application of constructed wetlands in cities, including cost, land, and policies. Respondent B felt that constructed wetland is an effective advanced sewage treatment technology. Both respondents believe that should evaluate the entire life cycle cost of the constructed wetland to determine whether it is effective. The life cycle cost of constructed wetland is a method to evaluate the total cost of an asset during its life cycle, including construction cost, maintenance cost, and operating cost. Although constructed wetland is an environmentally friendly sewage treatment technology, it has some limitations for its application in cities. Therefore, when the large-scale application of constructed wetlands in cities, it should be planned to a suitable place to make it play the most effectively. In the background of global warming, green wastewater treatment technology will be one of the significant developments, so it is important to improve the restrictions on the application of constructed wetlands in cities.

The constructed wetlands can meet both the value of sewage purification and landscape aesthetics at the same time. Therefore, the landscape -type constructed wetlands method is recommended to be used instead and included in the green space plan to solve the contradiction between constructed wetlands and urban land. It can be used as a central point connecting the city's sewage treatment plant and the river as an important natural filtration system before the discharge flows into the river. After the sewage is deeply purified by the landscape-type constructed wetlands, the treated water can be raised in standard or quality to fulfill the Class I or Class II of the national water quality standards for Malaysia.

CONCLUSION

The research results show that the application of constructed wetland in sewage treatment plants has limitations because it is uneconomical to use constructed wetland in densely populated cities. In addition, the discharge standards of some sewage treatment plants do not meet the recycled water reuse standards, limiting the use of recycled water. Furthermore, most sewage treatment plants do not have tertiary sewage treatment because they have no purpose for reclaimed water reuse. However, land, cost and policy may affect the application of constructed wetlands in cities. Therefore, the publication of relevant policies on the comprehensive utilization of water resources may encourage sewage treatment plants to apply tertiary sewage treatment technologies further to purify wastewater.

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STUDY ON SOIL MIXTURE STRENGTH DEVELOPMENT FORECASTING BASED ON BP NEURAL NETWORK AND SVM

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ABSTRACT
The strength value is a core indicator in the field of soil stabilization, so evaluating the strength development is a common problem in geotechnical engineering. Compared with the traditional linear fitting method, Machine Learning applied in the engineering field is a more effective and accurate method for fitting and predicting data. The aim of this research was to explore whether the unconfined compressive strength values of soil mixtures can be accurately predicted by machine learning model. Back Propagation Neural Network (BPNN) and Support-vector Machines (SVM) are classical algorithms in the Machine Learning field, and both algorithms will be tested in this research. On the other hand, to improve the precision rate, this research uses an empirical formula to determine the quantity of hidden layers of the Back Propagation model and uses grid searching to find the best penalty factor value and size of mapped dimensions of the SVM. The results showed that both Machine Learning algorithms have higher accuracy, but that SVM has a better performance compared to BPNN: the average R2 value of SVM is 0.94426; the average R2 value of BP NN is 0.94426. It provides a new statistical method for soil performance research in the future.

Keywords:
Machine Learning, BP Neural Network, Support-vector Machines, Soil improvement, Unconfined compressive strength.

INTRODUCTION

Soil is the various sediments generated by the rock's physics, chemistry, weathering as well as denudation, transport, sedimentation, and other complex processes in the natural environment (Zhejiang University, Southeast University, & Hunan University, 2014). Generally, the soil is composed of water, air, and various mineral substances. Due to its complex contents and loose structure, and with the reinforcing agent increasing, the soil's unconfined compressive strength value always shows non-linear growth. Rather than relying on traditional methods, machine learning can be a better method to analyze and predict soil mixture's properties. (Scott Kirts, Orestis P. Panagopoulos, Petros Xanthopoulos, & Boo Hyun Nam, 2018).

Either cement or concrete, on the other hand, can provide high strength to reinforce soil. However, both have high costs and may harm the environment during the production process. While lime, fly ash and blast furnace slag, the cheapest of the energy conservation substances, can be regarded as a similar reinforcing agent as cement and concrete. However, when calculating strength development in these substances, it has its limitations such as loose structure and uneven content. As mentioned above, linear fitting may no longer be suitable for presenting soil mixture strength development. Therefore, instead of a traditional fitting formula, Machine Learning can be used as an approach for solving this problem.

By Phil Kim (2016) mentioned that Machine Learning is a technology that uses data to establish a model. It is a branch of artificial intelligence in which a computer generates rules underlying or based on raw data that has been fed into it. Machine Learning in civil engineering domains has been extensively explored in concrete structure strength prediction and engineering detection, due to its powerful performance of non-linear fitting (Kai Li, Yunpeng Long, Hao Wang,

& Yuan-Feng Wang, 2021). The results show that Machine Learning performs well in the civil engineering field. Most studies investigate the cement or concrete mix with soil, because of its uniform structure and high strength. In this research, Machine Learning will be applied in civil engineering objectives through: (1) To determine what factors affect the physical and mechanical properties of the soil mixture;(2) To determine which types of Machine Learning models have the highest adaptability and generalization in the geotechnical engineering field;(3) To determine if Machine Learning models have higher performance and accuracy than equation fitting.

LITERATURE REVIEW

Machine learning has proven to perform well in engineering. S.KUMAR and P.K. BASUDHAR（2018） established a neural network to predict the stability of slopes by establishing empirical relations for stability coefficients adopting a machine-learning process analyzing available data in the form of tables or charts. Kai Li (2021) uses three types of machine learning models to predict concrete creep, based on BPNN, SVR (support vector regression), and ELM (extreme learning machine). In other research, BPNN can be used to predict laterite's strength when was reinforced by cement, and the precision has high accuracy (Yang Yuting, 2010). However, there is not much research applied to it in the field of geotechnical engineering.

Scott Kirts et al.(2018) created a soil-compressibility prediction model using SVM and he explored the relationship between the compression index (Cc), recompression index (Cr), and the overall settlement. He found that the Cc model for fine grains (clays and silts) is strong and compares well with existing correlations while Cr model could not be obtained. Amit Gajurel (2019) adopted LR (Logistic regression), DA (discriminant analysis), KNN (k-nearest neighbors), and SVM to analyze UCS values which are used to establish the optimum additive amount of chemically stabilized subgrade. The results show that the KNN model has the highest performance compared to the others, and SVM with the radial kernel showed better performance than SVM with the polynomial kernel. Based on previous research, it shows that the generalization ability of machine learning is high in the field of geotechnical engineering. This research uses both BPNN and SVM established models to predict the UCS of soil mixture. The theory of both algorithms will be discussed briefly in Methodology.

METHODOLOGY

Theory of BPNN

Back Propagation Neural Network is one type of Artificial Neural Network (ANN). ANN is a machine-learning system based on the biological nervous system. According to S.KUMAR et al. (2018), ANN consists of a group of neurons logically arranged in multiple layers. These neurons interact through weighted connections. The Back Propagation technique developed by Rumelhart et al. (1986) for multilayer feedforward neural network is based on propagates backward of error. The basic structure of BP neural network is shown in Fig 1.

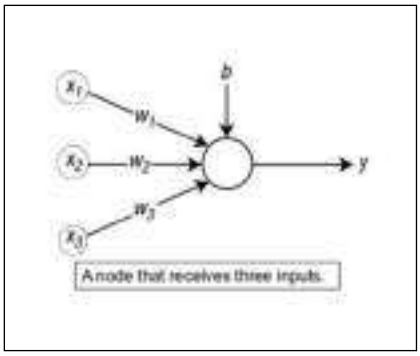


Figure 1: Structure of a Node of BP Neural Network (Lan Goodfellow, 2016)

Fig 1 refers to x1, x2, and x3 are the input signals; w1, w2, and w3 are the weights of the corresponding signals; "b" is the bias. The circle and arrow on the figure represent the node and signal flow. The information from the neural net is stored in the form of weights and biases. The matrix equation of the weighted sum can be expressed as:

$$v = wx + b \tag{1}$$

Where, w and x are represented as:

$$w = \begin{bmatrix} w_1 & w_2 & w_3 \end{bmatrix} \qquad x = \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} \tag{2}$$

In Fig 2, the group of leftmost nodes is called the input layer. It only inputs data to the model and does not calculate any functions. On the other hand, the group of rightmost nodes in an ANN is called the output layer. The output of these nodes is then the final result of the ANN. The layer between the input layer and output layer is called the hidden layer. According to the number of hidden layers, there are three types of BP Neural Network. The structure as follow:

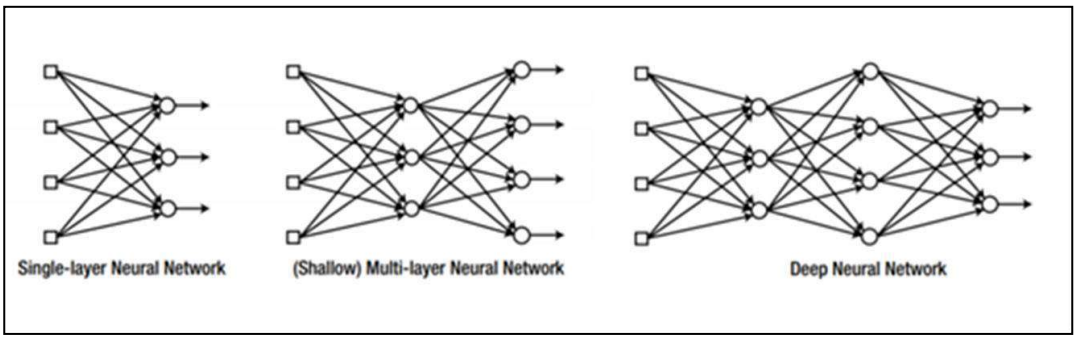


Figure 2: Structure of 3 Types of BP Neural Network (Lan Goodfellow, 2016)

Theory of SVM

The original SVM algorithm was invented by Corinna and Vladimir (1995). SVM provides supervised learning models with associated learning algorithms for analyzing data for classification and regression analysis. Support-vector machines construct a hyperplane or set of hyperplanes in a high dimensional or infinite-dimensional space and can be used for classification, regression, or other tasks like outlier detection, or to identify the underlying vector structure. In classification, the hyperplane with the largest distance to the nearest training data point can achieve positive separation. In general, the larger the boundary, the lower the generalization error of the classifier. The distance between the separate hyperplane and the training data closest to the hyperplane is called the margin. The hyperplane with the maximum margin is called the optimal separating hyperplane. The basic structure of the SVM is shown in Fig 3.

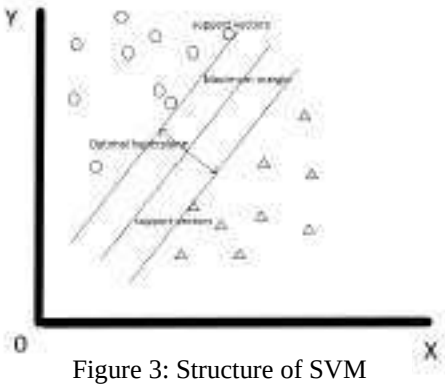


Figure 3: Structure of SVM

The linear regression formula of SVM is:

$$D_x = \mathbf{w}^T \boldsymbol{x} + b \tag{3}$$

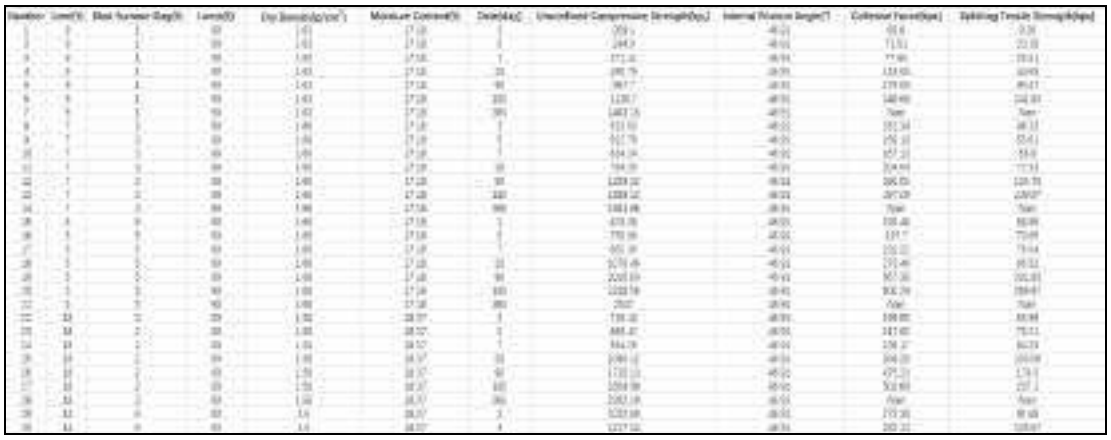
Where, w is an d-dimensional vector, b is a bias term, i = 1, . . . , N

$$\mathbf{w}^T x_i + b \begin{cases} > 0 \text{ for } y_i = 1, \\ < 0 \text{ for } y_i = -1 \end{cases} \tag{4}$$

Dataset

This paper collected the previous data from Investigation of Strength and Microstructure of Lime-blast Furnace Slag Stabilized Loess (Zhang Li, 2020). In this dataset, to improve accuracy, the author made one sample of soil mixture with three specimens and a total of 351 samples. This research collects all the data and calculates the average value for each content sample, collecting 117 values in this experiment. All the experiments follow The Standard for Test Methods of Earthworks (GB/T50123-1999). Table1. shows an example of dataset, for sample no.1-no.30(In total, there were 117 samples in this model):

Table 1: Example of Dataset for Sample No.1-No.30 (Zhang Li, 2020)



In this paper, the trial-and-error method is used to segment the dataset for training and testing and the optimal proportion of this combination is found to be 70% versus 30%. In model training, this paper randomly chooses 70% of the data regarded as training data.

Data Analyzing

Through data analysis, this research can explore and understand the relationship between each element. This paper calculates the correlation coefficient for determining the hidden information in the dataset. The correlation coefficient of these two random variables is a measure of their linear dependence. If each variable has N scalar observations, then the Pearson correlation coefficient is defined as:

$$\rho(A,B) = \frac{1}{N-1}\sum_{i=1}^{N}\left(\frac{A_i-\mu_A}{\sigma_A}\right)\left(\frac{B_i-\mu_B}{\sigma_B}\right), \tag{5}$$

Where "μA" and "σA" are the mean and standard deviation of A, and "μB" and "σB" are the mean and standard deviation of B. The correlation coefficient matrix of two random variables is the correlation matrix coefficients for each pairwise variable combination:

$$R = \begin{pmatrix} \rho(A,A) & \rho(A,B) \\ \rho(B,A) & \rho(B,B) \end{pmatrix}, \tag{6}$$

Since ρ(A,A) and ρ(B,B) are always directly correlated to themselves, the diagonal term are only 1, that is:

$$R = \begin{pmatrix} 1 & \rho(A,B) \\ \rho(B,A) & 1 \end{pmatrix}. \tag{7}$$

Model Establishing

This paper uses MATLAB2020 to establish BP neural network model, SVM model and equation linear-fitting model.

Step of BP Neural Network

In general, the main steps for application of the ANN model are data collection, normalization, determining the number of hidden layers and neurons, choice of activation function as well as training data and validation leading to error minimizing and avoidance of over-fitting.

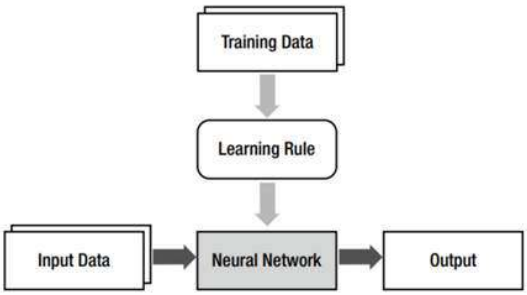


Figure 4: Structure of Neural Network (Lan Goodfellow, 2016)

According to Lan Goodfellow(2016), the deeper the model, the higher the generalization for various tasks. It means that using a deep architecture does express a useful prior over the space of functions in model. This paper uses an empirical equation to determine the value range of hidden layers (GUO Haitao,2000):

$$K < \sum_{i=0}^{n} C_j^i \tag{8}$$

$$J = \log_2 n \tag{9}$$

$$J = \sqrt{n + m} + \alpha \tag{10}$$

Where J is the number of units in hidden layer; K is the number of samples; n is the number of units in input layer; for Cji ,if i>J, Cji = 0; m is the number of units in output layer, α is a constant from 1 to 10. Through repeated testing, this paper sets one hidden layer in this model, and the size of units in the hidden layer is 9.

Step of SVM

The main steps of an SVM are data collection, normalization, determining the best quantity of penalty factor and mapped dimension, choice of activation function as well as training data. This paper sets gamma in the kernel function and uses grid searching to find the best penalty factor value and size for mapped dimensions.

Step of Equation Linear-Fitting Model Establishing

In this paper, the polynomial function is regarded as the approximation function, and on the other hand, this model uses the least square method to minimize errors. Under different soil mixture content, this paper builds a model based on soil mixture strength development and maintenance time. This paper takes values of 180 days from the dataset and uses them to test the accuracy of the model.

RESULTS AND DISCUSSION

Correlation Coefficient Value Result

This research uses MATLAB2020 to implement the algorithm and gets the result as follow:

Table 2: Correlation Coefficient Value

	lime	blast furnace slag	loess	dry density	moisture content	date	UCS	CF	STS
lime	1.00000	0.35303	-0.59096	-0.90293	0.83150	-0.00000	0.16599	0.13735	0.13550
blast furnace slag	0.35303	1.00000	-0.37015	-0.00919	0.55731	0.00000	0.71774	0.67018	0.64949
loess	-0.59096	-0.37015	1.00000	0.82141	-0.97713	-0.00000	-0.51374	-0.46549	-0.45369
dry density	-0.90293	-0.00919	0.82141	1.00000	-0.91448	0.00000	-0.12988	-0.10146	-0.10016
moisture content	0.83150	0.55731	-0.97713	-0.91448	1.00000	0.00000	0.45186	0.43428	0.42669
date	-0.00000	0.00000	-0.00000	0.00000	0.00000	1.00000	0.55261	0.80363	0.83844
UCS	0.16599	0.71774	-0.51374	-0.12988	0.45186	0.55261	1.00000	0.99488	0.99655
CF	0.13735	0.67018	-0.46549	-0.10146	0.43428	0.80363	0.99488	1.00000	0.99347
STS	0.13550	0.64949	-0.45369	-0.10016	0.42669	0.83844	0.99655	0.99347	1.00000

The correlation coefficient value shown above was transformed into a heat map, the details as follows:

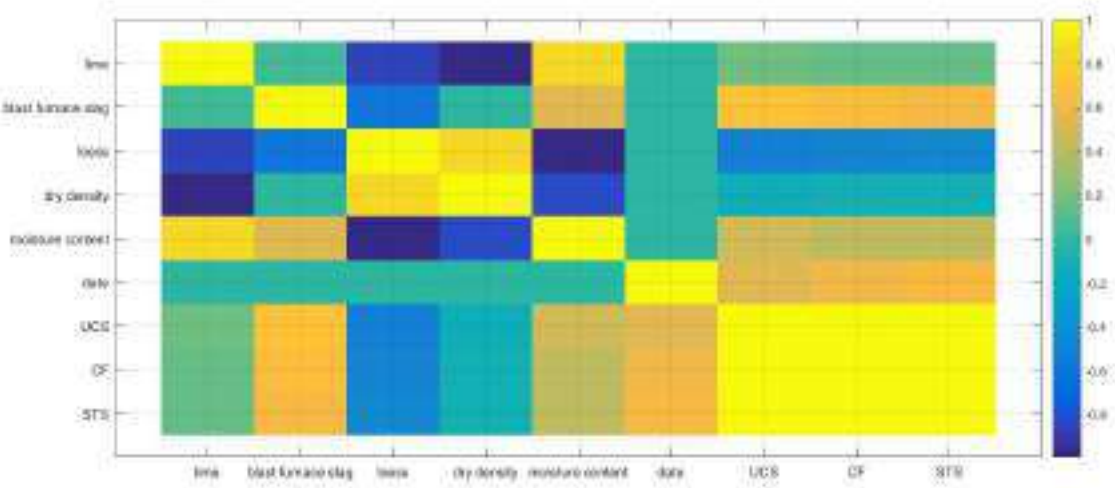


Figure 5: Heat Map of Soil Mixture Features

Where UCS is the unconfined compressive strength value; CF is the cohesive force value; STS is the splitting tensile strength value.

Model Result

Through machine learning models and equation fitting models established and tested, this paper gets the following results:

Machine Learning Model

Table 3: Comparison of R^2

	R^2 of prediction										
Test number	1	2	3	4	5	6	7	8	9	10	11
BP	0.74941	0.7506	0.9463	0.874	0.9823	0.8724	0.9689	0.9005	0.9757	0.9279	0.8626
SVM	0.96027	0.85598	0.9348	0.971	0.93652	0.92344	0.89117	0.95662	0.97152	0.94552	0.94862
Percentage of error(%)	28.14%	14.04%	1.22%	11.10%	2.62%	5.89%	8.02%	6.23%	0.45%	1.98%	9.97%

Table 4: Comparison of R^2

Test number	12	13	14	15	16	17	18	19	20	Maximum Value	Average Value
BP	0.9824	0.9531	0.9534	0.9699	0.8159	0.743	0.9119	0.9823	0.9831	0.9831	0.9053
SVM	0.96575	0.99337	0.96781	0.97481	0.93457	0.87915	0.96789	0.96074	0.92556	0.99595	0.94428
Percentage of error(%)	1.69%	4.29%	1.51%	0.51%	14.52%	18.32%	6.14%	2.19%	5.85%	1.18%	4.38%

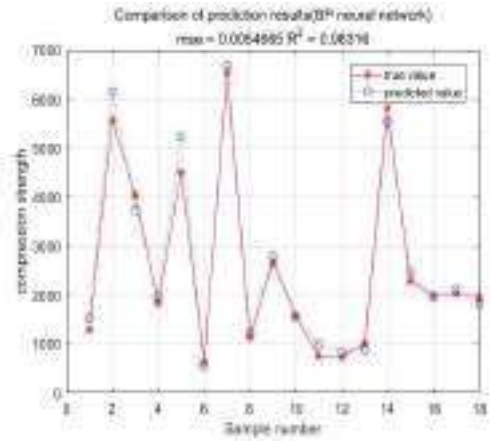


Figure 6: Prediction Result of BP Neural

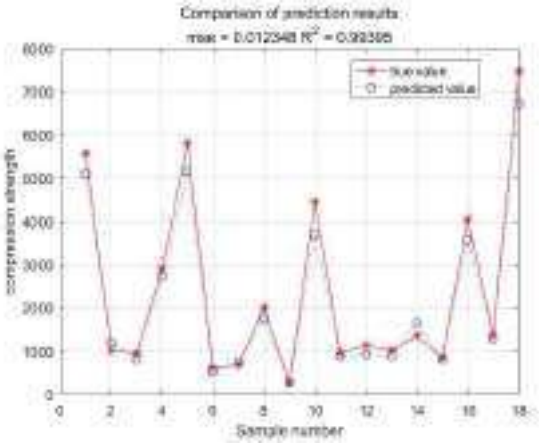


Figure 7: Prediction result of SVM

Equation Linear-Fitting Model

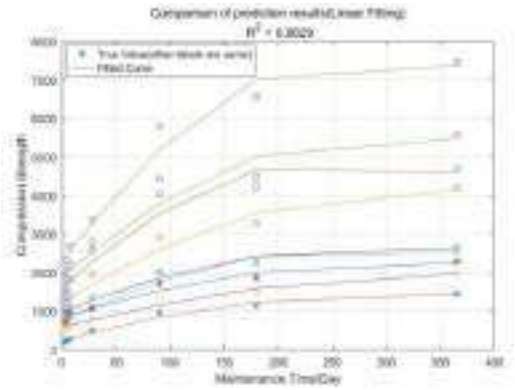


Figure 8: Prediction Result of Equation Linear-

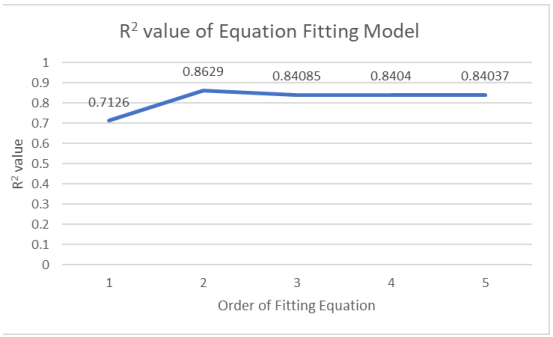


Figure 9: R^2 Value of

Where, R^2 is coefficient of determination, the formula as follow:

$$R^2=1-RSS/TSS \quad (11)$$

$$RSS \text{ (Root-Sum-Squares)} = e_1^2+e_2^2+\ldots+e_n^2 = \sum(y_i - \hat{y}_i)^2 ; \quad (12)$$

$$TSS \text{ (Total Sum of Squares)} = \sum(y_i - \bar{y}_i)^2. \quad (13)$$

The formula of error percentage as follow:

$$\text{Percentage of error} = (\ | R^2 \text{ of BP} - R^2 \text{ of SVM} |) / R^2 \text{ of BP} * 100\% \quad (14)$$

DISCUSSION

From this Fig 5, some hidden information can be found: (1) There is a very high correlation between UCS, CF and STS, because CF and STS grow with the growth of UCS ;(2) The correlation coefficient between lime and UCS is very low, while blast furnace slag is high. It means that blast furnace slag plays a dominant role in soil mixture strength development. This is in agreement with Zhang Li (2020); (3) The Loess shows a negative correlation with UCS, which means that with an increase in loess, the UCS of the soil mixture gradually declines. Moreover, the "Date" has zero correlation with soil mixture properties except UCD, CF, and STS, which is consistent with our theoretical understanding (Saeid, et al, 2018).

This paper establishes two machine learning models and randomly chooses the same training data running both models 20 times, getting a coefficient of determination (R2) values. The closer the R2 close is to 1, the less error there is. As shown in Table 3 and Table 4, using machine learning methods to predict soil mixture is feasible in practice. On the one hand, due to most the percentage errors having an absolute value less than 20%, it means that unconfined compressive strength values of soil mixture can be predicted and both models have the same predicted trends (Abd Manan, et al,2021). On the other hand, through comparison, SVM has more accuracy than BP neural network in one single sample. The BP neural network's highest R2 value is 0.9831(Fig 4.), while the lowest R2 is value only 0.743. A possible reason is that under different training data, BP neural network may more easily trap into local optimality or may more easily trap into overfitting than SVM.

In addition, SVM presents better stability than BP neural network in that SVM has a higher average value of R2 than BP neural network. One possible reason is that SVM has more generalization abilities than BP neural network. In summary, SVM has better performance than the BP neural network in this research, where the highest R2 value is 0.99395(Fig 5).

For linear-fitting model results, regardless of whether a BP neural network or SVM is used, the machine learning model has more accuracy than the equation linear-fitting. Fig 6 is the result of second-order equation fitting, and R2 is only 0.8629. Fig 7 shows the R2 value of each order fitting equation which shows that second-order equation fitting has the highest accuracy of prediction.

CONCLUSION

This research analyzes machine learning applied in the civil engineering field and does a series of experiments to prove that machine learning performs well in soil mixture strength prediction. Through correlation coefficient calculations, this research determines that the main element of soil mixture development is blast furnace slag. Through model result comparison, SVM has the best performance, whatever in predicting accuracy or generalization ability. Moreover, both machine learning models have higher R2 values than the equation linear-fitting. Therefore, based on the above research, the machine learning method can be regarded as a better method than equation linear-fitting to predict compressive strength values or other soil mixture property values.

RECOMMENDATION

In this research, the BP neural network has low accuracy and stability, due to the local optimality problem and overfitting problem. In future research, people could combine the BP neural network with a series of optimization algorithms, such as ant colony optimization, Particle Swarm Optimization, and simulated annealing algorithms, to enhance the local optimum and overfitting problems.

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DESIGN OF ANTENNA ARRAY FOR BREAST TUMOR DETECTION

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ABSTRACT

Breast cancer has in recent time become a leading cause of mortality among women, which necessitate a suitable means of early detection for fast and effective treatment. X-ray Mammography, which is currently the commonly used method of breast screening, comes with limitations such as missed detection because of poor malignant/benign cancer tissue contrast as well as exposure of the breast to radiation. Microwave imaging serves as a better alternative to X-ray mammography, because of its harmlessness to humans and better detection. In this paper, a study on the effects of the bending of the microstrip antenna array for breast tumour detection is presented. The antenna array was designed with resonant frequencies of 2.4 GHz and return loss less than -35 dB. The antenna is simulated by introducing a truncated edge slot at the network feedline of the conformal antenna array. The result shows that the proposed antenna design is capable of detecting the breast tumour with improved characteristics compared to other designs available in the literature. The simulation analysis of the designed antenna is carried out using CST software. The capabilities and bending effect of this antenna for detecting different tumour sizes is investigated and its potential is highlighted. The results obtained with this antenna design makes it suitable antenna for breast tumour detection

Keywords:
Breast Tumour Detection, Microstrip Patch Antenna, Antenna Array, CST, UWB Antenna, Biomedical application.

INTRODUCTION

Early diagnosis of breast tumour in women is very important for proper and effective treatment. This, however, necessitates locating the precise position and size of the tumour in the breast since tumour is tiny at early stage; the knowledge of its precise location is chiefly required (Srinivasan and Gopalakrishnan, 2019). Microwave imaging (MWI) is an encouraging technique because it is able to detect the precise location of the tumour, and also, distinguish between normal and cancerous tissues from their dielectric properties (K. Ouerghi, A. Smida, R. Ghayoula and N. Boulejfen 2017). Unlike the other conventional methods of diagnosis of tumour such as X-ray, MRI, the Microwave Imaging (MWI) method is non-ionizing, non-invasive and reasonably cheaper cost. Therefore, this purpose serves as a driving force and urge to explore more research areas in microwave imaging (MWI) for early detection of breast tumour. There are two approaches in Microwave Imaging (MWI): Linear (Pierri, Leone and Persico, 2000) and nonlinear (Khalil and Jiadong, 2014) imaging methods, these two approaches have both been applied to reconstruct the electrical properties of the breast from measured data.

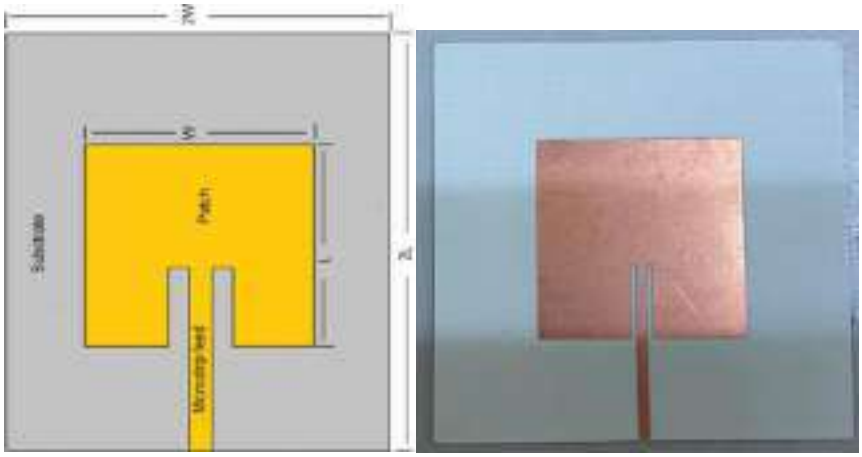
The microwave imaging techniques measures the scattered field from the tumour illuminated by electromagnetic waves radiated from transmitting antennas. The scattered signals strongly depends on many factors, including the environment, dielectric properties of the object, signal strength (Zhong Qing Zhang et al., 2003). For a given signal source in a certain environment, the scattered signal depends on the electrical properties of the object. (Shrestha et al., 2012). There are information contained in the scattered field as regard the conductivity and dielectric properties of the breast that can be reconstructed using imaging algorithms. The breast tumour have very distinct electrical properties, such as permittivity and conductivity, they are possible to be detected by analysing the

scattered signals. It is left for Medical practitioners to examine the electrical properties reconstructed from the scattered field for tumour detection.

In this paper, we develop an array antenna consisting of four (4) element antennas to form a 1X4 array antenna, two (2) element antennas to form 1X2 array antennas and a single element patch antenna. The array antenna is perfectly suited for microwave imaging (MWI) technology due to its numerous advantages such as extremely low profile, fairly inexpensive, and easy to fabricate/manufacture. Due to their sizes, the array antenna was fabricated on a printed circuit board (PCB) using photo-etching technology. The array antenna was designed to operate at a single frequency. The geometry of these array antenna is chosen for the best illumination to the target in near field measurements. Rogers RO 4003C material is used for substrate with dielectric constant 3.38. The choice of Rogers RO 4003C is because a flexible substrate is required so as to meet the objective of having a bendable antenna around the breast. The aim is to investigate the effect of bending the array antenna around the breast. The array antenna is designed using CST Microwave studio for simulations. The array antenna were chosen and used for our microwave imaging system, because the use of microstrip arrays in biomedical applications help enhance the performance of the antenna by increasing the gain, enhancing the directivity scanning of the beam and other function that are limited in a single element (K. Ouerghi et al, 2017). Additionally, the array antenna has good impedance matching, efficiency and proper bandwidth.

SYSTEM CONFIGURATION AND RESULTS

Computer simulation technology (CST MWS) software is used to design antennas and systems models, as well as investigates the effect of the bending on the antenna. A preliminarily designed single element patch antenna is shown in figure 1. Depicted in table 1 is the compressive details of antenna array specifications.



(a) (b)

Figure 1. (a) Geometry of the single patch antenna: W = 34.50, L = 31.53, Substrate = Rogers RO 4003C, Patch and feed = Copper, Inset Length = 12.20, Gap = 1.57; (b) Front view of the fabricated patch antenna.

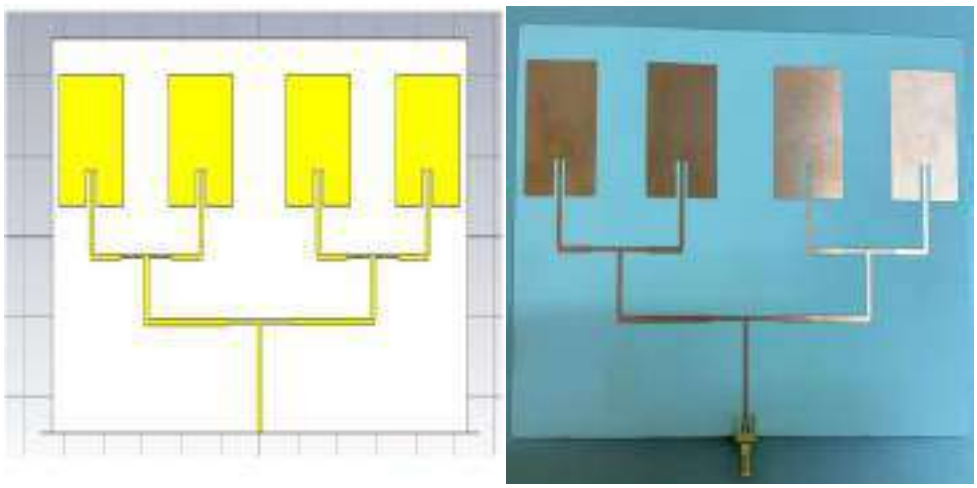
The operation frequency of the designed patch array antenna is 2.4 GHz. To enhance the accuracy of the detection, the single element of the microstrip antenna was optimized to an array antenna. And this has resulted the need to balance the gain as well as the size of the array antenna.

The SMA connector was soldered to the bottom of the feedline. Take into consideration that after the results of the single element has shown to be satisfactory, the single element was optimized to design a 1x2 array antenna, which was subsequently optimized to design the 1x4 array antenna as shown in figure 2(a) and figure 2(b) respectively.

Table 1: Design specifications of the antenna array design.

Design Specification	**Value (mm)**
Patch antenna length	31.53
Patch antenna width	34.50
Ground plane length	38.75
Ground plane width	42.00
Inset length	12.20
Roger board thickness	0.508
Copper thickness of patch	0.035
Gap between inset and patch	3.8
50 Ω feedline length	23.3
50 Ω feedline width	2.6

Figure 2(a) shows the antenna array design in CST while figure 2(b) shows the fabricated antenna array with SMA connector. Measured and simulated S-parameters of the 1x4 antenna array are shown in Figure 3. It can be observed that there is a sound agreement between the simulated and measured S-parameters of the 1x4 antenna array. Interestingly, as it can be seen, both the simulated and measured antenna array resonates at 2.4 GHz.



(a) (b)

Figure 2. (a) Simulated 1x4 antenna array (b) Fabricated 1x4 antenna array with SMA connector.

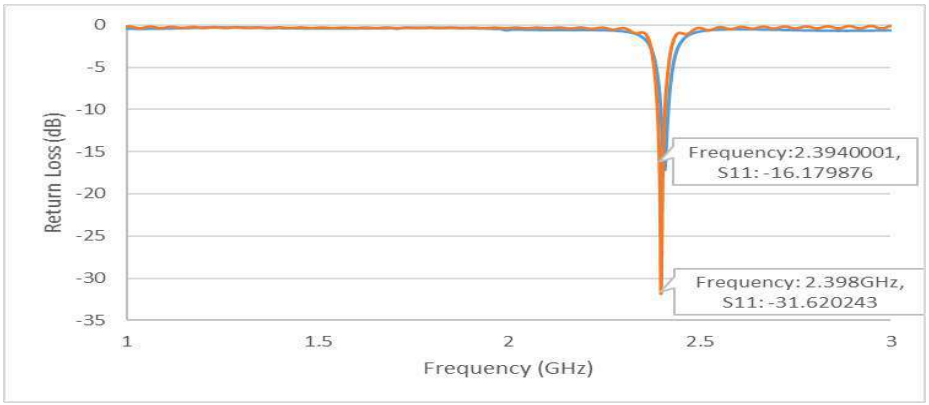
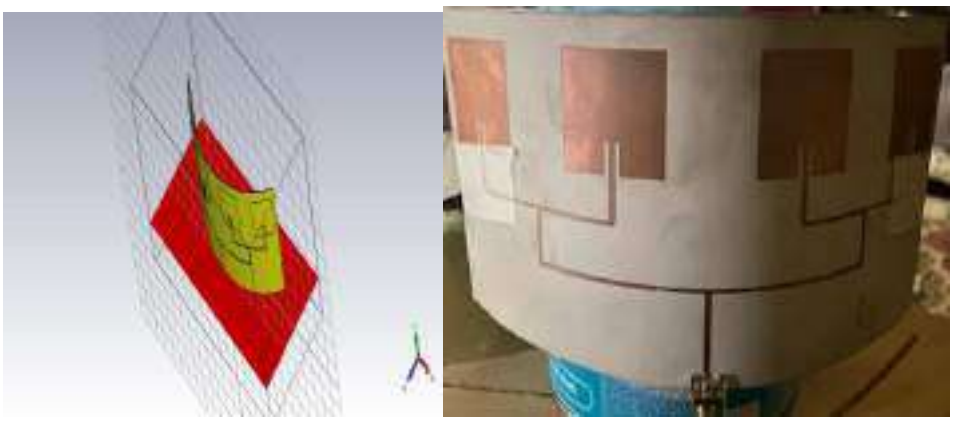


Figure 3: Measured and simulated S-parameters of the 1x4 antenna array

In order to check the performance of the array antenna as regards to the bending effect on the detection of breast tumour, a dielectric cylinder is deployed at the back of the antenna array. Note that the curvature of the array varied in terms of degrees. The height and radius of the cylinder depends on the degree of the curvature. The curvature of the antenna array simulated in CST and also the measured are shown in figure 4. Additionally, table 2 and table 3 depicts the simulated and experimental real measured value of different curvatures with resonating frequency and return loss as well. Notice, that from both the tables we can observe that there is a change in resonance frequency when the radius of the curvature increases. Figure 4(a) shows the curvature of antenna array design in CST while figure 4(b) shows the curvature of fabricated antenna array. Also shown in figure 5 is the comparison of the bending effect of the fabricated array antenna in S-parameters.



(a) (b)

Figure 4. (a) Simulated 1x4 antenna array (b) Fabricated 1x4 antenna array with SMA connector.

Table 2: The simulated value of curvature of 1 x 4 array.

Bending Degree	Curvature Radian	Radius(r) $S = r\theta$	Resonance Frequency (GHz)	Return Loss S11
0	-	-	2.408	-37.37
5	3.055	89.95	2.404	-24.21
7	3.0019	90.85	2.382	-28.92
10	2.967	92.65	2.398	-31.62
13	2.837	94.33	2.396	-24.69
15	2.880	95.45	2.304	-22.81

Table 3: The measured value of curvature of 1 x 4 array.

Bending Degree	Radius (r) $S = r\theta$	Resonance Frequency (GHz)	Return Loss S11
0	-	2.426	-35.78
5	89.95	2.400	-13.19
7	90.85	2.441	-14.56
10	92.65	2.394	-16.17
13	94.33	2.484	-16.01
15	95.45	2.399	-15.72

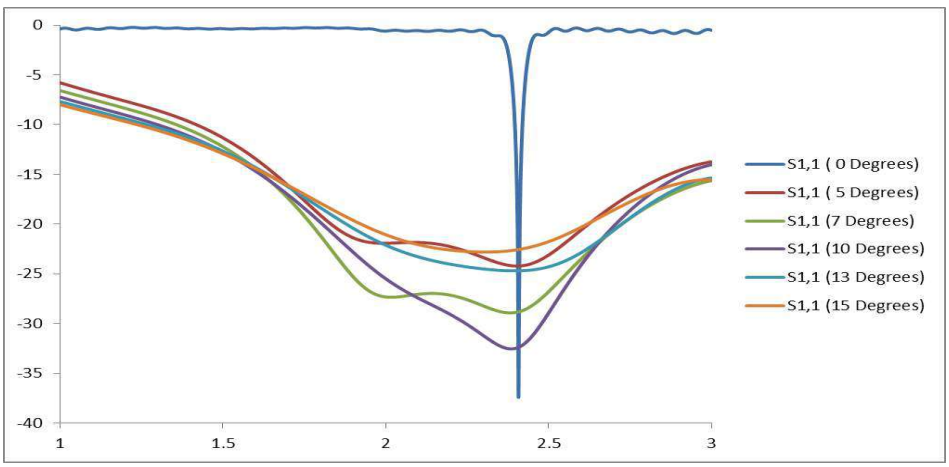
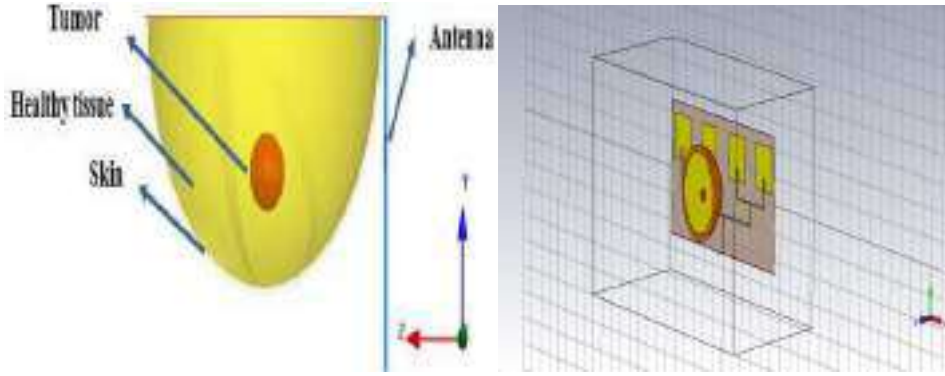


Figure 5: Measured S11 results of curved antenna array

BREAST PHANTOM DESIGN

A model of the breast was created using the CST microwave studio software as shown in Figure 6. The model of the breast is an approximate replication of a human breast. Varieties of breast phantoms are distinguished by the critical electrical properties that are the relative permittivity εr and the conductivity **'σ'**. As clearly seen in figure 6, the geometry of the microstrip antenna, the homogeneous 3D model of the breast phantom (Figure 6a) and the breast phantom design in CST (Figure 6b) consisting of skin, tissue and tumour were determined using the different dielectric properties. Tabulate the dielectric properties of the concept was developed as a half-sphere with 3 mm thick skin layer and 25 mm outer radius. Within the skin layer is found a fibro-glandular breast fatty tissue layer of radius 22 mm. A plane wave proceed towards the model through the z-axis, and the field is located at 4 mm. The breast model is stimulated by the stimulus of the plane wave. The plane wave is transmitted across the device and provided by the ground afterwards. A tumour is positioned as a 10 mm diameter ring inside the fibro-glandular breast fatty tissue membrane. Table 4 illustrate the information of breast phantom dielectric properties.



(a) (b)

Figure 6: (a) Breast model with tumour; (b) Breast phantom design in CST

Table 4: Breast phantom dielectric properties

Parameters	εr	σ (S/m)
Skin	36.58	2.3404
Tumour	67	49
Fatty skin	4.8393	0.26229

BREAST PHANTON DESIGN FOR TUMUOR IDENTIFICATION

In the construction of a breast phantom, three different layers were considered, these are; skin, fat, and tumour. But the silicon bra act as the skin in the designed phantom. The fat and tumour of the breast were fabricated and measured based on the procedures presented by (Islam, M. S, 2018). The dielectric properties of numerous tissues are considered by permittivity, which is the mean of complex-valued dielectric, as stated in Eqn (1)

$$\varepsilon(\varepsilon = \varepsilon r + i\sigma/\omega\varepsilon 0) \quad (1)$$

Where εr represents the dielectric constant and σ denotes the conductivity of the tissue against frequency. The dielectric permittivity of vacuum here is $\varepsilon 0$, and the angular frequency is ω. The image of the fabricated homogenous phantom is illustrated in figure 7.

For the fat and tumour, Sodium chloride (NaCl), polyethylene powder, agar powder, xanthan gum, sodium dehydroacetate monohydrate, and distilled water are used. Polyethylene powder is used to adjust the permittivity and NaCl to improve the conductivity. Agar is used to keep the shape of the phantom by preventing separation of water content, xanthan gum is used as a thickener and sodium dehydroacetate monohydrate as a preservative. The materials which alter the dielectric properties of this method are NaCl, polyethylene powder, agar, and distilled water, and they are the main ingredients in the fabrication of the fat and tumour. These materials are also natural to fabricate and possess high mechanical properties. The selected materials make it easy to produce the fat and tumour inside the breast phantom although different concentrations of the materials are used for both layers.

Figure 7: Developed homogenous breast phantom with tumour

EXPERIMENTAL SETUP AND RESULTS

An automated microwave imaging system was used for experimental validation. The breast phantom is placed under the antenna array after the antenna has been perfectly set up with the vector network analyser as shown in figure 8(a). Figure 8(b), presents the proposed experimental set-up on how the antenna array is bent around the breast phantom. Recall that, one of the objectives of this thesis is to investigate the effectiveness of the antenna array in a curved position around the breast phantom. The parameters of VNA are set as the IF-bandwidth is 10 Hz, the output power is 10 dBm, and the frequency range is 2 to 3 GHz. The microwave pulse is transmitted to the phantom from the transmitting antenna, simultaneously the reflected backscattered signals are collected by the same receiving antennas. The transmission parameters depend entirely on the antenna path. Most of the reflected parameters present the shallow depths under the skin layer. The signals are bounced off to the opposite side of breast phantom and attenuated significantly. The reflected signals can perfectly be detected by the antenna which has higher gain, directional radiation pattern, and lower reflection coefficient. Shown in figure 9 is location of the tumour inside the breast tissue structure (2D Image) (9a) Top view of breast model (9b) 2D Image for each breast tissue for different value of reflected power S11 value. In this research, the antenna array was tested in five different bending degrees, the five different bending degrees are perfectly chiselled into a fine wood, so as to enable easy bending

as shown in Figure 8(b). Subsequently, the comparison of S11 of the antenna array in all the bent degrees on the breast phantom is presented in Figure 10 while Table 5 outlines the overall antenna performance.

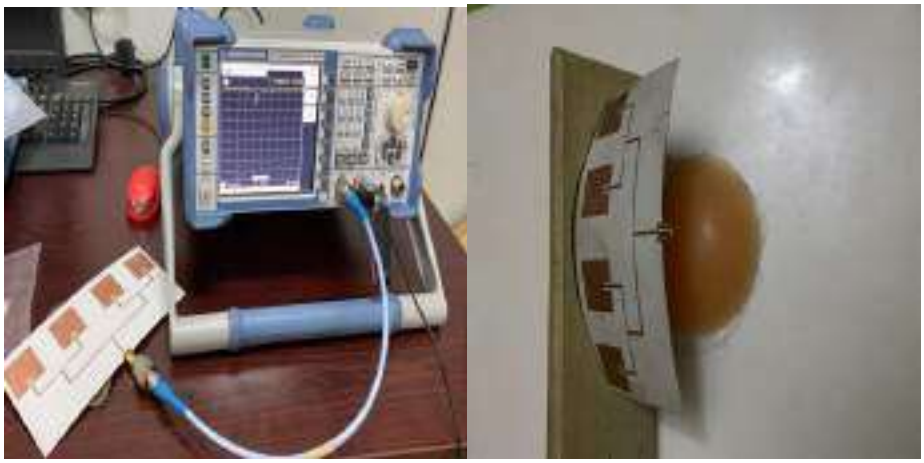


Figure 8: The Experimental setup. (a) Breast phantom under the antenna array after the antenna has been set up with vector network analyser. (b) presents how the antenna array is bent around the breast phantom

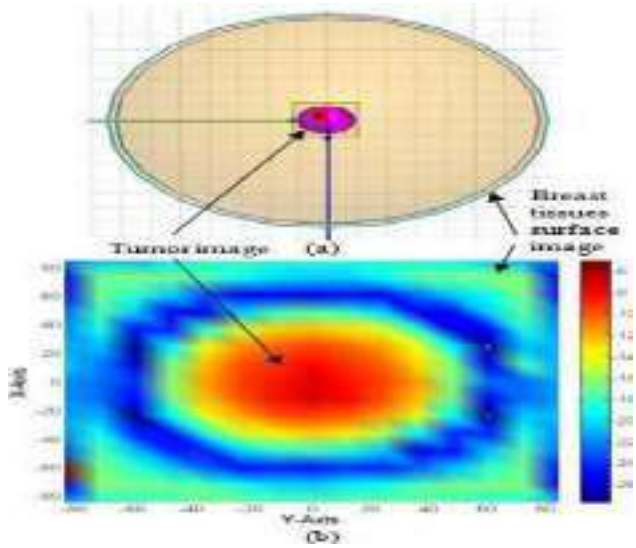


Figure 9: Position of the tumour inside the breast tissue structure (2D Image) (a) Top view of breast model (b) 2D Image for each breast tissue for different value of reflected power S11 value.

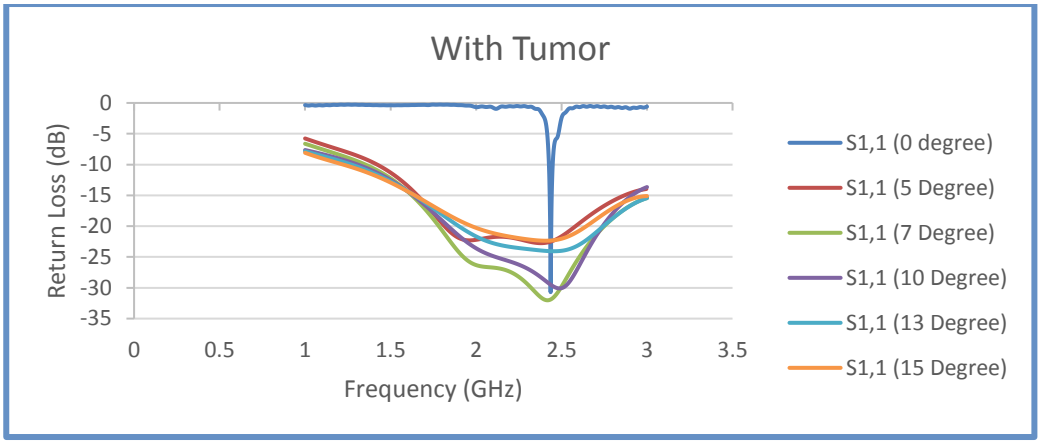


Figure 10: Comparison of S11 of the antenna array in all the bent degrees

Table 5: Outlines the overall antenna performance.

Antenna Performances		0 Degree	5 Degrees	7 Degrees	10 Degrees	13 Degrees	15 Degrees
Free Space	Frequency (GHz)	2.408	2.404	2.382	2.386	2.396	2.514
	S_{11} (dB)	-37.37	-24.21	-28.92	-32.54	-24.69	-22.36
On-silicon Bra	Frequency (GHz)	2.436	2.380	2.418	2.488	2.456	2.406
	S_{11} (dB)	-30.70	-22.75	-32.02	-30.09	-24.06	-22.36

CONCLUSION

In this paper, we developed an array antenna designed to investigate the bending effect on breast tumour detection. The importance of the MWI has been emphasized and the configuration of the designed antenna was also presented. The result from the bending effect of the S-parameters shows that it has the capability for target detection.

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THE EFFECTIVE ADAPTATION OF GREEN BUILDING CONCEPT USING BUILDING INDUSTRIALIZED MANAGEMENT WITH (BIM) FOR THE UPGRADED CONSTRUCTION MARKET

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ABSTRACT
The construction business environment is becoming more complex these days, with more issues that must be addressed by teamwork. However, the Building Information Modeling (BIM) innovation is listed as a way to untangle the aforementioned issues in order to deliver a better assignment efficiency. Various issues, such as continuous errors and rework, team misunderstandings, construction waste, energy inefficiency, and many other industry issues, can be improved with the introduction of BIM technology. The BIM feature, in particular, aids in the design and construction process as it necessitates extensive preparation and decision-making. Many studies have been conducted on BIM however, there hasn't been any study that aims at bringing a consensus in regards to the application of the technology for the establishment of green buildings. This research is aimed at investigating the innovative benefits, upper hands and functional adaptability in the concept of Green Building Design with BIM technology. The thesis report has had the decision to discover certain issues related to Construction the load up and functional process. The study is going to utilized both qualitative and quantitative data collection techniques through interview and questionnaires respectively. The qualitative data will be analyzed via content analysis whereas the quantitative data will make use of SPSS as an analyzing tool. The finding of this study confirms the effectiveness of the adaptation of green building concept using building industrialized management with BIM for the upgraded construction market.

Keywords:
BIM technology, Green Building Design, Green Building Concept, Construction Industry, Sustainability

INTRODUCTION

There are often criteria and requirements associated with building construction in the twenty-first century global structure industry. The European Parliament has also instructed each of the 28 member states to use BIM in their 2016 activities to reduce the structure climate. This allows some Scandinavian countries to advance and become more productive in building construction. Time, cost, and quality are important indicators in estimating the success of construction projects. Before the venture begins, an assessment is required to determine the ability to fulfill building requirements. The board will devise a counteraction or reaction plan based on the evaluations after effects at the arranging stage. Digital assets, plan angles, and quality norms are described in the planning cycle by strategies, sketches, and specialized particulars. The AEC (Architectural Engineering and Construction) industry is currently undergoing revolutionary changes, as evidenced by the shift from CAD (Computer various Aided Design) reports to BIM (Building Information Modeling) (Building Data Modeling). Because of the vast amount of data that is packaged and then retrieved from computerized models, BIM opens up possible outcomes. Calculations, relations, and properties can all be shown as an object in a BIM configuration (Nguyen et al., 2021). Creating separate pictures for contract archives and then a new arrangement of itemized pictures is often considered waste.

Environmental change is incredibly stressful in today's world, and its degree of impact on the climate is very stressful anywhere. This is why architects, organizations, and analysts in the construction industry are presenting cutting-edge technologies and energy frameworks that include green solutions to address some of the issues associated with global warming. Nonetheless, the idea behind these innovations is to reduce air pollution caused by other construction projects. The growth

of BIM engineering and the inspiration behind "making green systems" has renamed the working environment in the western world "Green BIM." Reduce carbon outflows in the structure, boost energy efficiency, improve ecological execution, increase waste management productivity, and improve indoor and outdoor living structures in this way. Furthermore, everyone can see its impact and contribution to public and private development projects. The construction industry is a thriving sector that operates in an environment of vulnerability and rapid change in the area of self-government (Bank et al., 2010).

LITERATURE REVIEW

The Model of Architectural Information is another development in a normalized environment, despite the fact that the utilization of creativity in the fields of design, engineering, architecture, and building management has not expanded recently (Lu et al., 2017a). In the construction industry, advances in cutting-edge technology include 2D and 3D computer illustrations. BIM (Building Information Modeling) is a different plan and period that uses best-in-class PC equipment and programming. In a nutshell, Data Modeling is a configuration model with a high level of execution that improves the quality of life for development and structure projects. The role of BIM Transforming adds nuance to teamwork and collaboration among all partners, while also keeping the business's building plan in mind. As it is constructing another building, BIM encourages collaboration among developers, specialists, contract workers, and building supervisors (Wang et al., 2018).

BIM do not only aids in the reduction of loss of building structure, but also in the reduction of litigation. Instead of human readings aimed at guide changeover, convert the basic documents used in building design and construction into modern machine-readable representations for automation. In the 1990s, building project material was transferred from paper to digital 2D-CAD drawings (Maskil-Leitan et al., 2020). Are moving away from image-based technologies and toward model-based techniques and materials. The models that are created are friendlier than normal. As a result, BIM is becoming more and more relevant in the construction industry.

BIM is a market metric that is supported by creativity. The loop should be completed in order to advance invention use. It's important to note that conventional building methods employ a variety of advancements, but the BIM scheme makes use of this innovation (Kushwaha, 2016). BIM is described as a structural methodology that involves the use of computerized models to enable the investigation of structures made from normalized plan details, and perhaps a dynamic and plan improvement that is fast. For the overall plan of the structure, the BIM software has several points of concern. The current BIM software design employs a precise configuration in which all product and components, as well as the airplane plan and other pertinent documents, examine the object, and the product directs them directly to the item (Chang & Hsieh, 2020). The image indicating the elements of BIM software design is as follows:

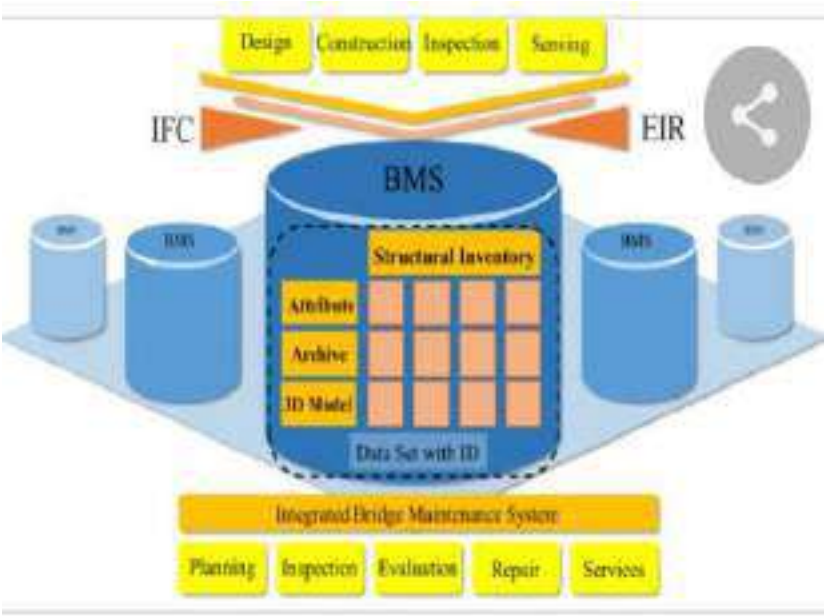

Figure 1: Elements of BIM software design

The rapid automated development of the architectural industry in recent years, such as PC sponsored plan, has enabled the replacement of traditional reports and the coordination of traditional work. In addition, The BIM simple will catapult architecture to new heights of ingenuity. The BIM system provides opportunities to improve maintainability through strands of solid cooperation with different component details. Green BIM" is emerging as a new era in the construction industry, serving as a bridge between BIM and maintainability (Cheng & Das, 2014). While the term "green BIM" has grown in popularity, several studies have been conducted to demonstrate its true significance. Green BIM is seen as a way to achieve fair progress in the project through the methods used in the BIM project in production. The Green BIM initiative has been recognized as a tool for assisting green structure and building configuration.

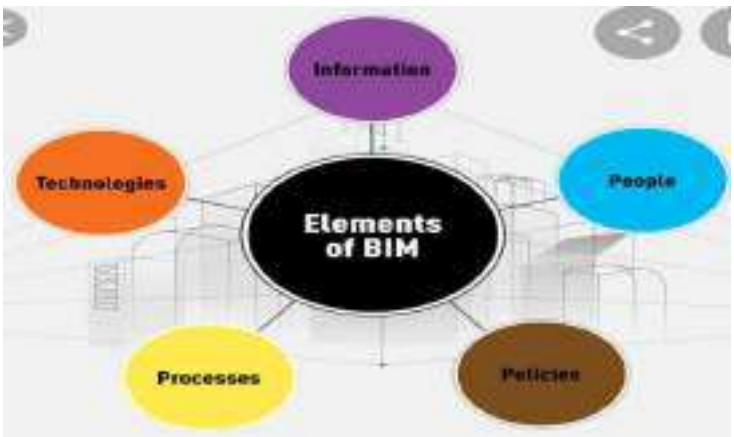

Figure 2: BIM configuration

Green BIM Concept

The principles of Green BIM are normally used to describe sustainable constructing layout and production incorporating the use of BIM technology. In general, sustainable improvement standards entangle the environmental element regarding resources usage, financial element related to the capacity to support financial production, and a social component that establishes mechanisms to characterize social well-being (Mounika & Hema, 2018). Correspondingly, Green building is described as more effective use of resources such as electricity, water, materials, and land than conventional homes or homes built to modern-day codes. In contrast, unsustainable or environmentally friendly construction is characterized as "excessive overall performance constructing", wherein inexperienced strategies should limit or mitigate environmental effect toward land use, constructing layout, production and operation (Lindblad, 2013). Green building goal is to increase performance of herbal sources usage in concurrent with diminishing negative effect at the environment. As a result, the architecture venture community must be accountable for developing and constructing houses that are energy efficient, use natural or recycled materials, and are environmentally friendly (Ilhan & Yaman, 2013).

BIM is been used to domesticate better average efficiency in building business activities, both in terms of the benefits offered and the challenges that must be overcome in order to ensure the business's long-term viability. Hence, the key phrases used to seek related records for this paper essentially epitomize "Green BIM", sustainable layout and construction", "sustainability with inside the construction enterprise", "sustainable BIM", and similarly combinations of those (Lu et al., 2017b). However, it became excellent for those documents in some reasserts to have views on fundamentals, norms, and concepts that define "Green BIM" as a whole. The most relevant documents were eventually given on this paper's conclusion and discussion pages, which recapitulated the sub-subjects of previous Green BIM reports using Green BIM to improve construction enterprise practices.

Figure 3: Benefits of BIM software design

BIM as reported by (Ismail et al., 2019) is a modeling technology associated with processes for creating, communicating, and analyzing a design model that describes the design components as digital representations to create coordinated data. Hence the integration of the BIM mechanism in terms of the climate friendly or maintainable structure. It could mean adapting an advanced technology, with digital models for reference, to facilitate the control of environmental impacts in the

design, construction and operation of buildings resulting from its immense technology Activities to achieve smarter and more efficient ways to sustainability in the construction industry.

RESEARCH METHODOLOGY

Two method of data collection were carried out which is questionnaire and interview. The data collection instrument tool that are used in this study are interview and questionnaires. The target population were individuals who have knowledge about BIM topic. The principal instrument of information gathering in this study was questionnaires. The quantitative data was gathered from the start and toward the finish of the semester through questionnaire form which included 7-point Likert Scale questions regarding self-viability discernments and 5-point Likert Scale questions concerning transformation of Green Building Design Concept. The questions in the questionnaires were both organized (close-ended question) and unorganized (open-ended question). Since it tells a more realistic tale about the actual condition within the enterprise and often reflects on the real conditions for this research, the qualitative methodology is considered to be the best fit for this study. As for the qualitative data, it will be gathered from an interview as data collection method which will involve the contribution of two experts in the upgraded construction market. Through Interview, meaningful data was to be collected to contribute to the validity and reliability of the data used in this research. The interview used opennded questions that allowed the respondents to provide a detailed explanation to the questions they answered. Following patterns in the literature review, this research utilizes a blended technique plan. Methodologies, techniques and strategies are consolidated to get more noteworthy broadness and profundity of comprehension and verification. The study also outline was an expository overview study (Zhou et al., 2018). The figure below summarizes the study overview:

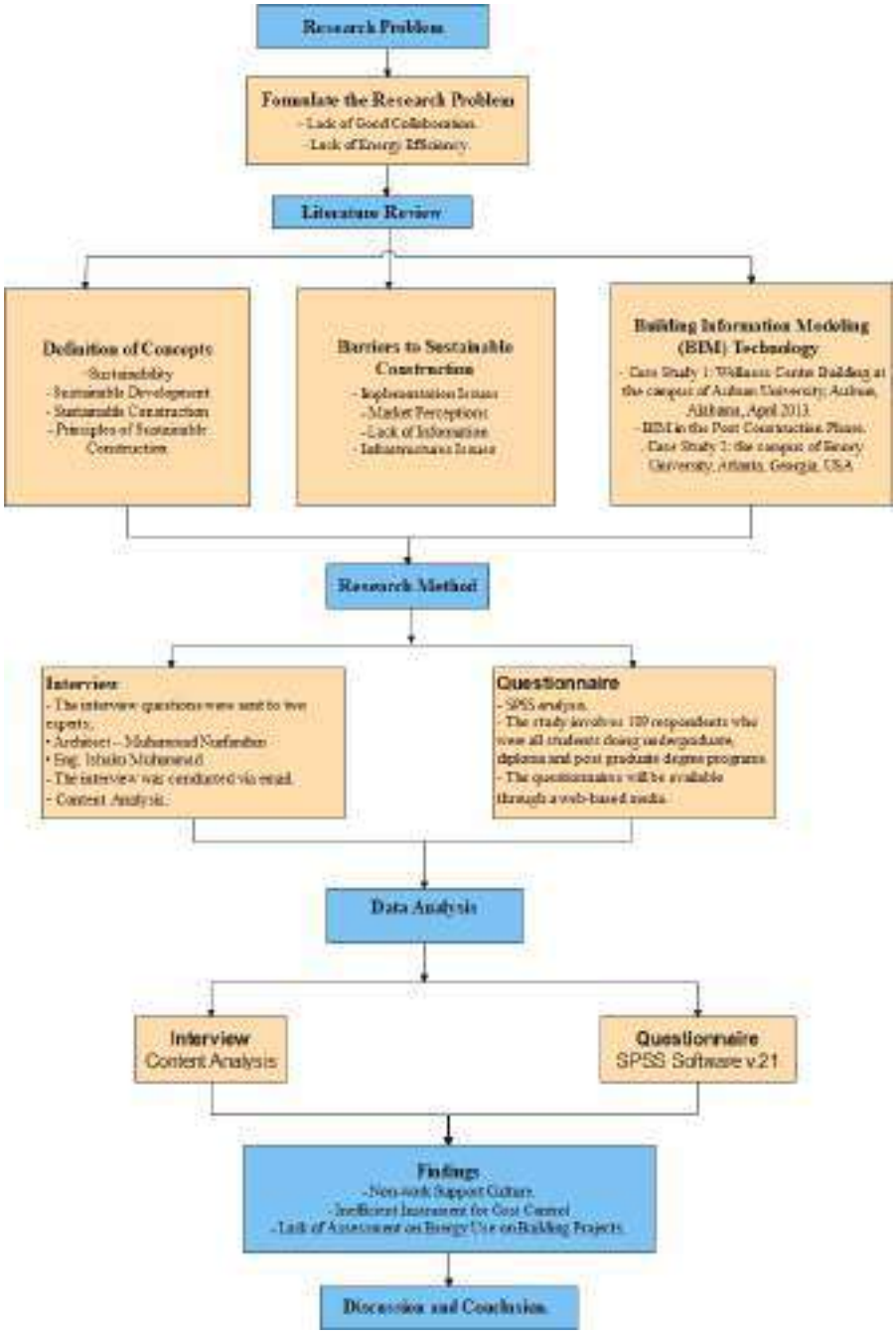

Figure 4: The Study Overview

When it comes to drawing the charts and tables, all gathered data will be recorded in a SPSS sheet. The data will then be examined before separating the findings and afterwards the data will be addressed in its fitting formats. The questionnaire utilized the shut finished inquiry design, which gives a uniform packaging of references for respondents to pick their answers. The questionnaire

utilized five Likert scale with unequivocally concur, concur, nonpartisan, deviate, firmly differ decisions to focus on one develop, "Overseeing variation of Green Building Design Concept with BIM into a New upgraded Construction Market". For the qualitative research, the data collected will be analyzed through content analysis. Content analysis will reveal the intentions and communication trends of the two experts interviewed to come up with the general results. Through relational content analysis, a relationship that exists between concepts given in the interview shall be established.

To quantify the effective variation of green building design concept with BIM into a new construction market, the analysis looked to know whether the transformation was restless while Building Design Concept. Having taken a gander at both the innovative and functional components, we can say that green building design assumes a significant part in preparing the construction market to receive new building plans.

DISCUSSION AND RRESULTS

This provides the conclusion and discussion arrived at from the various student research on BIM technologies in the construction market. Several benefits and challenges were explored from the condition surrounding BIM and the level of expertise needed for the BIM implementation. The data were dissected utilizing the Statistical Package for the Social Sciences (SPSS). This study analyzed 109 respondents who were to provide answers to the questionnaires provided for this study. The interview survey questions were sent to professional impalement scales are used to estimate the reliability and validity of particular items. The scales used to measure reliability were built on Cronbach's alpha and the inside consistency of the items. Cronbach's alpha is a measure used to assess the reliability or internal consistency of a set of scale or test items. In other words, the reliability of any given measurement refers to the extent to which it is a consistent measure of a concept, and it is one way of measuring the strength of that consistency. However, it's a measure of internal consistency, how closely related a set of items are as a group. Moreover, Cronbach's alpha was used to calculate and make sure stability coefficient alpha based on the total number of surveys that was send. Therefore, the Cronbach's alpha in this study, standardized items are (.793) this point proved that the items have relatively high internal consistency.

The interview questions where send to two professional individuals, Eng. Ishaku Muhammad and Arch. Muhammad Nurfarahin who are experts in building engineering which are sustainable building and actively participate in the construction of green buildings. The outcomes produced are helpful and practical, based on their professional expertise and priceless experience. Each of the two experts interviewed was given interview questions intended to accomplish specific objectives. The results from both the interview and the 109 respondents predict the effective adaptation of green building concept using building industrialized management with BIM for the upgraded construction market. The outcomes that this preliminary study has obtained can support the applicable research or adaptation of green building concept using building industrialized management with BIM for the upgraded construction market.

CONCLUSION

Housing sustainability in the construction industry could lead to a more intense design environment. Green BIM in conjunction with real estate development platforms can potentially help achieve real estate goals. Development actors benefit from countless advantages when they integrate BIM into their real estate construction projects and without experience. Bugs and Rework through coordinated digital models, fast conventional processes that save time and money, encourage more practical communication and collaboration in interval project teams, and much more. Some challenges that

need to be managed along with the implementation process itself. For costs for additional software, compatibility problems in Knowledge transfer between completely different operating systems, which is unusual for users with the code program.

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CONCEPTUAL FRAMEWORK FOR THE DETERMINANTS OF USER SATISFACTION AND ITS EFFECT ON ELECTRONIC WORD-OF-MOUTH ON ONLINE GROCERY

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ABSTRACT

The online platforms have provided enough access to the consumers to attain information about a product or services. The transmission of online information regarding experiences and opinions regards as electronic word-of-mouth (eWOM) have been evolving over the years. Understanding e-WOM is very important to many online grocers to reach nationwide audiences quickly and easily as most business activities now shifted to the digital realm. Nevertheless, the behaviour of consumers has been affected by different system platform and environmental factors such as system quality, service quality, social influence and facilitating conditions, resulting in user satisfaction and overall engagement on e-WOM. The objectives of this paper are to investigate the internal and external influence on user satisfaction and its overall impact on e-WOM on online grocery. The paper is to be conducted using quantitative method, which are the distribution of questionnaires survey. A conceptual framework is proposed for the investigation into the determinants of user satisfaction and its impact on e-WOM on online grocery. The findings of this paper will contribute better understandings on the current issues to grocery business owners and relevant academicians will be able to fully utilise them to enhance further studies on e-grocery sector as a whole.

Keywords:
E-WOM, User Satisfaction, System Quality, Service Quality, Social Influence, Facilitating Conditions

INTRODUCTION

Development of new media cannot be separated from the emergence of the Internet and the World Wide Web due to the globalization of information technology. Social media is a media where users can easily participate in, share and create messages, including blogs, social networks, online wikis or encyclopaedias, virtual forums, including virtual worlds (Nor et al., 2014). According to Nuseir (2019), electronic word of mouth (e-WOM) is a form of marketing communication that contains positive or negative statements made by potential customers, customers or former customers about a product or company, which available to many people or institutions through the medium of the Internet. In the online world there are various ways in which consumers can exchange information.

Internet users can conduct Electronic Word of Mouth through a variety of online channels, including blogs, microblogs, e-mails, consumer review sites, forums, virtual consumer communities and social networking sites (Dahka et al., 2020). In reflecting on the feeling of pleasure and satisfaction from consumers, it will be directly proportional to a positive image view for the product or brand. The Electronic Word of Mouth and the Internet has enabled the emergence of new forms of communication platforms that can better empower providers and consumers, enabling them to share information and opinions from both Business-to-Consumer, and from Consumer-to- Consumer (Muritala, 2021).

Today's e-WOM are becoming more and more technically complex and challenging, which exposes e-commerce operations to even more complex constraints. System values can be regarded to be the basis that forms and influences human behaviour. Obviously, researchers are only focused on internal factors when studying eWOM such as information quality, system quality and service quality

(Fraj and Martinez, 2017; Wu, DiGiacomo and Kingstone, 2016). Unfortunately, limited study is focusing on the influence of external factors (Aakash & Aggarwal, 2019). As such, both internal and external environmental factors should be included in the eWOM study as a whole instead of just as a sum of their parts. External factors are always playing a crucial role in propagating the new technology (Dragnic, 2016). The social influence and facilitating conditions as the external problems are widely touted for constraint analysis, greatly limit researcher's capability in modelling and resolving constraints to achieve consumer's satisfaction.

Existing research methods have long been blamed for their limitations in modelling and communicating constraints, including inability to cope with other-related mediating and moderating precedence constraints and difficulty to evaluate and communicate inter-dependencies at the field of e-grocery level (Yan et al., 2018; Ismagilova et al., 2020). As the level of competition in the Malaysian e-grocery market continues to rise, it is critical for Malaysian e-grocery businesses to gain a better understanding of their customers in order to expand their market share (Martín et al., 2019).

Therefore, assessing e-WOM has been an increasing topic of business owners to create new strategic marketing plan and the influence of many internal and external factors on consumers satisfaction in Malaysia found to be underwhelming nowadays (Choi et al., 2019). In the course of the investigation, the present study endeavours to illuminate this irregularity by building up a single integrated conceptual framework to connect and simultaneously inspect the connections between internal factors, external factors, user satisfaction and e-WOM in online grocery platform.

This study aims to carry out by utilizing classifications of user satisfaction and e-WOM involvement proposed by past studies. This coordinated e-WOM model would provide the foundation for building a consensual model, which may better clarify these relationships. In this regard, the current writing focuses on investigating the relationships between the antecedents and consequences of e-WOM from both, internal and external perspectives.

VARIABLES ANALYSIS

This section presents a review analysis of the variables of previous studies namely, e-WOM, user satisfaction, system quality, service quality, social influence, facilitating conditions and brand image.

E-WOM

Electronic word of mouth (e-WOM) is defined as the dynamic and ongoing information exchange process between potential, actual, or former consumers regarding a product, service, brand, or company, which is available to a multitude of individuals and institutions via the Internet (Ismagilova et al., 2020). One of the most comprehensive conceptions of eWOM was proposed by Litvin et al. (2018), who described it as all informal communication via the Internet addressed to consumers and related to the use or characteristics of goods or services or the sellers thereof. Where once consumers trusted WOM from friends and family today, they look to online comments (eWOM) for their information about a product or service (Huete-Alcocer, 2017). Therefore, e-WOM is defined as the influence of friends' words and advice on individuals, acquaintances, and other customers when they buy groceries online.

User Satisfaction

According to Ratnasari (2020), the definition of customer satisfaction has been widely debated as organizations increasingly attempt to measure it. User satisfaction deals with the characteristics of human behaviour (Ravichandran & Suriya, 2016). Some researchers define a satisfied customer within the private sector as one who receives significant added value in brief with a definition that

may apply just as well to public (Hamzah & Shamsudin, 2020). Therefore, user satisfaction describes a customer's reaction or feeling about his or her experience with all aspects of an e-grocery system.

System Quality

Quality of the system defined as perceived website performance by consumers through the uptake and transmission of information (Putri & Pujani, 2019). The quality of system is the perceived level of satisfaction of users to the technical and functional performance of the website (Tandon et al., 2018). Therefore, in the context of this writing, system quality refers to a metric for evaluating an e-grocery system portal that focuses on the end result of the user's interaction with the portal. It has all of the desirable characteristics of an e-grocery system, including intuitiveness, sophistication, adaptability, and response speed, as well as system flexibility, dependability, and ease of learning.

Service Quality

Service quality is a measure of how well the service level delivered matches customer expectations (Faruq & Hartini, 2014). Delivering quality service means conforming to customer expectations on a consistent basis. Service quality is defined as how customers judge and evaluate the service being delivered to them (Sari et al., 2018). Therefore, in this study the service quality refers to the level of support provided to system users by the online customer service department and support staff of e-grocery platform.

Social Influence

Argo and Dahl (2020) defined social influence as the processes whereby people directly or indirectly influence the thoughts, feelings and actions of others. According to Flache (2017), social influence is the effect on an individual based on behaviours of others. Friends, family, peers, co-workers and individuals or group of individuals who are related to a person behavioural intention can alter a person's thought, thinking and action (Garga et al., 2019). Therefore, in the context of this writing, the degree to which one person may influence another person's behaviour, attitude, sentiments, and thoughts to use new e-grocery apps and purchase groceries online is referred to as social influence.

Facilitating Conditions

Facilitating conditions defined as user perception that resources and support are available to use a new technology including availability of time, money and technological resources for technology adoption (Blaise et al., 2018). Facilitating conditions refer to objective conditions that can enhance adoption and the perception of consistency between what is offered by the technology and the user's immediate resources and values (Li et al., 2019). Therefore, facilitating conditions can represent easy access to the resources needed to use e-grocery apps and the subsequent support to purchase grocery online.

Brand Image

Brand image is the perception of the brand in the mind of the customer (Elina & Sany, 2013). It is an aggregate of beliefs, ideas, and impressions that a customer holds regarding the brand (Reddy & Ahmad, 2020). Brand image is the key driver of brand equity, which refers to consumer's general perception and feeling about a brand and has an influence on consumer behaviour (Ahmad & Guzmán, 2021). Therefore, the definition of brand image utilized as a part of this study is consumers' overall

perceptions about an e-grocery apps' brand based on their interactions and experience with the brand or their beliefs of what the brand could be.

THEORIES

Theoretical perspectives are defined as theoretical frameworks concerning a few aspects of a social or educational phenomenon that can be used as a conceptual model for explaining the research area (Picciano, 2017). Figure 1 shows in diagrammatic form of the two underpinning theories that may use in further study. Furthermore, the following sub-sections will explain the two theories that could be applied in the future research.

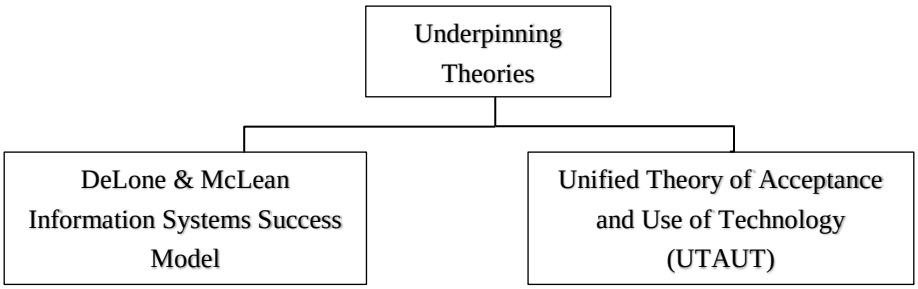

Figure 1: Underpinning Theories

DeLone & McLean Information Systems (IS) Success Model

The information systems success model is an information systems theory which seeks to provide a comprehensive understanding of information systems (IS) success by identifying, describing, and explaining the relationships among six of the most critical dimensions of success along which information systems are commonly evaluated (Grover et al., 2018). DeLone & McLean's comprehensive review of different IS success measures concludes with a model of interrelationships between six IS success variable categories (Angelina, Hermawan, & Suroso, 2019). The categories of the taxonomy are System Quality, Information Quality, IS Use, User Satisfaction, Individual Impact and Organization Impact. The model makes two important contributions to the understanding of IS success. First, it provides a scheme for categorizing the multitude of IS success measures that have been used in the literature. Second, it suggests a model of temporal and causal interdependencies between the categories (Mathar, 2020; Brings, Daun, & Brinckmann, 2018). A number of studies have undertaken empirical investigations of the multidimensional relationships among the measures of IS success e.g., (Harder et al., 2018; Cooper & Ritchey, 2019; Qiu & Dooley, 2019; Piehler, 2018; Busser & Shulga, 2018).

As a powerful communication and commerce medium, the Internet is a communication and IS phenomenon that lends itself to a measurement framework i.e., the DeLone & McLean model built on communication theory (Shi et al., 2018). In the e-commerce context, the primary system users are customers or suppliers rather than internal users (Abumalloh, 2020). Customers and suppliers will use the system to make buying or selling decisions and execute business transactions. These electronic decisions and transactions may affect individual users, organizations, industries, and even national economies (Lee et al., 2018).

The. DeLone & McLean proposed are evaluate for its usefulness in light of the dramatic changes in IS practice, especially the advent and explosive growth of e-commerce.

Unified Theory of Acceptance and Use of Technology (UTAUT)

In a bid to improve the predictive power of technology adoption models, UTAUT model provides a basic conceptual framework by combining models which forms the basis of this research (Bhatt et al., 2021). As a result of researches that emerged from different disciplines such as information systems, sociology and psychology many theories have been put forward and applied (Al-Saedi et al., 2019; Wrycza et al., 2017). In the research, eight main theoretical models: Personal Computer Usage Model; Innovation Diffusion Theory; Technology Acceptance Model; Theory of Reasoned Action; Combined TAM-PBT; Theory of Planned Behaviour; Social Cognitive Theory and Motivational Model were determined (Musleh et al., 2015).

UTAUT comprises of four main factors. These are; performance expectancy, social influence, effort expectancy and facilitating conditions are factors. In addition, UTAUT includes four intermediate individual variation variables, gender, age, experience and voluntariness of use, which predict the relationship between primary factors and behavioural intention and use behaviour (Musleh et al., 2015). According to UTAUT, there are determining factors that directly affect intention or use in models combined within the UTAUT framework. These determining factors are called performance expectancy (PE), social influence (SI), effort expectancy (EE) and facilitating conditions (FC). These factors play a prominent role as direct determinants of user acceptance and usage behaviour (Taherdoost, 2018).

The UTAUT model has drawn the attention of many scholars and has been applied to a varied number of technological innovations under different settings including internet banking, mobile banking, e-governance and e-learning (Sarfaraz, 2017).

It is a very common problem for end users to resist using such technologies. Users may not be very willing to use technology to perform their daily task. It is important to explain the acceptance and use of new technologies to better understand user-oriented problems and find solutions.

CONCEPTUAL FRAMEWORK

Given the past theoretical models accessible and investigations of conflicting discoveries, this writing proposed a conceptual framework from the literature approach by scholars that well-articulated with the result to system quality, service quality, social influence, facilitating conditions, user satisfaction and electronic word-of-mouth. In assuring this, DeLone & McLean Information Systems Success Model suggested that system quality and service quality can play an important role in the formation of user satisfaction and ultimately affecting the involvement of consumers in e-WOM. Whereas in view of the Unified Theory of Acceptance and Use of Technology (UTAUT), external factors ranging from social influence and facilitating conditions determine a consumer's satisfaction on e-grocery application to the spread of e-WOM.

Furthermore, the variables described in previous sub-topics have been used to form a diagrammatic view of the conceptual framework as shown in figure 2. Based on the review of the literature, it was posited that system quality, service quality, social influence and facilitating conditions have both direct and indirect influence on both user's satisfaction and e-WOM. The indirect influence is postulated to act through consumer's satisfaction. In other words, it was proposed that internal and external factors practices influence on e-WOM directly as well as, indirectly through the mediating effects of user satisfaction. In this conceptual framework, the writing attempts to

examine the influence of internal and environmental factor on user satisfaction and leading to e-WOM of the future selected population sample, namely grocery buyers.

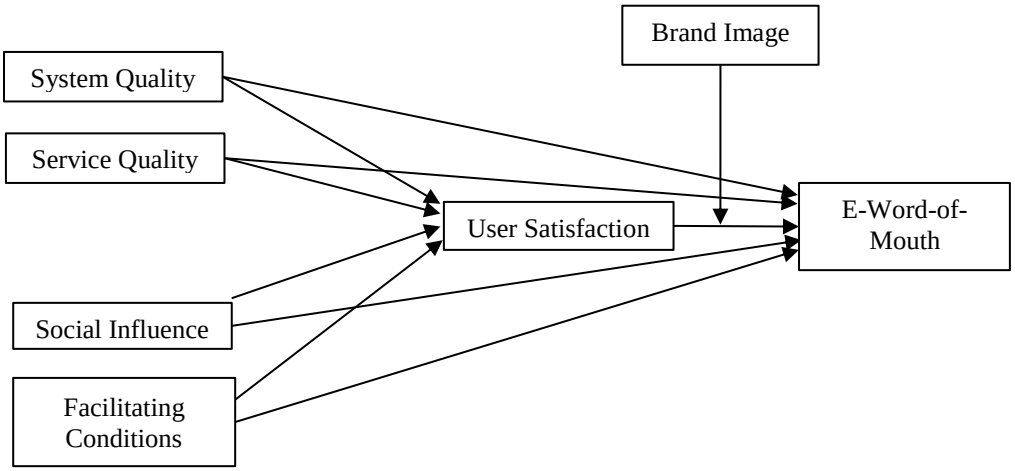

Figure 2: Conceptual Framework

CONTRIBUTION TO KNOWLEGE

This paradigm has also aided consumer participation in e-WOM in the context of online grocery shopping. The main contribution that conceptual framework adds to current theories in e-WOM studies is the studying and analysing the connection between the internal factors (system quality and service quality) and external factors (social influence and facilitating conditions) of online grocery buyers in Malaysia. Furthermore, the integration of the interceding variable - user satisfaction; and moderating variable - brand image offers a further contribution to the research.

Next, the combination of two theories (DeLone & McLean Information Systems Success Model and Unified Theory of Acceptance and Use of Technology) that formed the theoretical proposal will contribute to the e-WOM influence in the context of online grocery apps literature. Thus, this study provides a conceptual framework for further studies, especially for future research in online grocery industry.

CONCLUSION

The increasing usage of e-WOM by a new generation of grocery shoppers has been influenced by a variety of internal and external factors in grocery communities, all of which have an impact on user experience. This paper analysed related literature in order to present a framework of user satisfaction variables and their impact on e-WOM for Malaysian grocery customers. Furthermore, the relationship between brand image and individual user happiness needs to be further researched in order to understand the actual nature of the relationship and the magnitude of the influence. Ultimately, the purpose of this paper was to provide a clear knowledge of the actual link and determine if there is a good or negative association with customers' e-WOM, which could be verified by empirical research.

As a result, our proposed framework for e-WOM can lead to further research in quantitative research to confirm the model.

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