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THE INFLUENCE OF DIGITAL TECHNOLOGY ON ART TEACHING AND LEARNING IN CHINA HIGH SCHOOLS

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ABSTRACT – The role of the teacher in the teaching and learning process is crucial to ensuring that students comprehend the material being taught. However, teachers are now faced with the issue of teaching with technology. Today, technology encompasses many disciplines, including the fine arts. Therefore, technology-savvy educators are crucial in ensuring a successful learning experience. Therefore, instructors' use of technology should be prioritised for this process to function more smoothly. The present paper sought to propose a framework to examine Fine Art teacher technology adoption of Fine Art Digital technology tools based on the Extended Unified Theory of Acceptance and the Use of Technology (UTAUT2) model and Technological Pedagogical Content Knowledge (TPACK) factors.

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INTRODUCTION

The literature on the use of digital technologies in education has increased in recent decades (OECD, 2015; Sung et al., 2016)). Digital technologies serve a variety of educational goals and offer numerous advantages over traditional learning tools (Faber et al. 2017). Experiments have shown that digital technologies can be used not only as practical tools to promote learning outcomes and collaborative learning (Laakso et al., 2018) but also as valuable assessment tools to measure student progress and improve their teaching (Faber et al., 2017; Kurvinen et al., 2014; Laakso et al., 2018). Digital technologies, such as digital learning environments, are available for educators to use in the classroom (Laakso et al., 2018; Umek et al., 2017).

For technology to impact learning, certain conditions must be met, including support from school leaders, frequency of technology use and teaching methods (Greaves et al., 2010). For technology to impact learning, certain conditions must be met, including support from school leadership, frequency of technology use, and instructional practises (Bendici, 2019). For this to succeed, teachers need to know more about technology and its use. For example, Vancouver Public Schools in Vancouver, Washington, offers individual training to improve the use of technology in the classroom (Bendici, 2019). This training changes teachers' perspectives on how to support their students in using technology. As a result, teachers are exposed to classroom activities that promote digital skills development. Digital facilitators visit schools to help create lesson plans, teach technology-based lessons, and conduct demonstrations and model lessons (Bendici, 2019). The use of technology empowers educators with sound teaching and learning concepts and facilitates the delivery of comprehensible lessons. Digital and networked technologies enable the convergence of information, communication and educational resources. (Fulton & Sibley, 2003).

PROBLEM STATEMENT

A Chinese high school student must pass the Gaokao and the Yikao examinations to enrol in a college-level art programme. According to the Chinese National Ministry of Education, the academic (Gaokao) score of an art oriented (Yikao) student can be at least 70 per cent of the academic score of a regular student. If the regular student scores 500 on Gaokao, the art-oriented student must score at least 350 to be accepted into the same university (Ding, 2018).

In addition to demonstrating at least 70 per cent of the academic proficiency expected of regular Gaokao students, art students must also perform well on the Yikao. In China, the Yikao score often accounts for 60 per cent of the admissions process for "arts-oriented" high school students, while the Gaokao score accounts for 40 per cent (Ding, 2018). This nearly doubles the challenge for art students,

as they must study at least 70 per cent of academic materials and achieve the same level of art proficiency as their peers who only followed "normal" academics.

Ministry of Education of the People's Republic of China (MOE of PRC) stated that around 1,170,000 arts students took the College Entrance Examination, also known as Gaokao, representing approximately 11% of all Gaokao students (Ministry of Education of the People's Republic of China, 2020). Even though the number of art students decreased significantly in 2021 due to the pandemic and the reform of the college admission exam, a big proportion of high school students still choose art as their major

Due to the increased difficulty of the competition in China, teachers should educate themselves with art technology expertise to prepare for both components of the examination. Teachers who intend to refrain from utilising technology will make it difficult for students to take this examination. If this study is not conducted, many students may abandon their art studies, causing the country to lose brilliant artists.

RESEARCH QUESTION REVIEW

This paper proposes the following Research Questions:

1. Is there a positive effect of Extended Unified Theory of Acceptance and the Use of Technology (UTAUT2) or Technological Pedagogical Content Knowledge (TPACK) factors on teachers' Behavioral Intention to use Fine Art Digital Technology Tools in their teaching?

2. Does Behavioral Intention, Facilitating Conditions, Habit, or Technological Pedagogical Content Knowledge (TPACK) positively impact teachers' Fine Art Digital Technology Tools use behaviour?

RESEARCH OBJECTIVE

This paper proposes the following Research Objectives:

1. To examine the effect of Extended Unified Theory of Acceptance and the Use of Technology (UTAUT2) and Technological Pedagogical Content Knowledge (TPACK) factors on teachers' Behavioral Intention to use Fine Art Digital Technology Tools in their teaching.

2. To assess the teachers' Fine Art, Digital Technology Tools behavioural use on Facilitating Conditions, Habit, and Technological Pedagogical Content Knowledge (TPACK).

LITERATURE REVIEW

Art Education

The definitions of arts education focus on the themes covered in the arts and the connections between the arts and education. Numerous interpretations and perspectives regarding which subjects should form the Arts are constantly in flux (Ewing, 2010; Goldberg, 2012). Included among the arts subjects are "craft, dance, drama, film, literature (from picture books to poetry), media arts, music, photography, and so on" (Barton & Baguley, 2017).

One of the most important objectives of art programmes is to assist students in making connections between concepts and between disciplines (Stokrocki, 2005). Multidisciplinary integration in the arts enables pupils to build meaningful relationships. Personal identity, freedom, independence, the self, social structures, heroes, and environments as topics that assist pupils in connecting with the more fantastic world. In an arts programme, this link is vital (Stokrocki, 2005).

A comprehensive arts education provides a rich and fascinating curriculum that fosters students' capacity to think, reason, and comprehend global cultures. The creative skills children acquire through

the arts propel them toward new concepts, new experiences, and challenges and provide them with personal fulfilment (Bolujide, 2016).

Chine Art Education

Chinese high school students spend nearly every day of their three years preparing for the "Gaokao" (The National College Entrance Examination, or NCEE), an academic exam whose scores are used by all Chinese colleges to determine entrance. However, in addition to the well-known academic Gaokao college entrance test, many students opt for the "Yikao" (NCEE for Arts Students) to enter their selected colleges and majors. Yikao has been criticised for its classism and rejected for its "irrelevance" in Chinese culture, despite its increasing popularity (Ma, 2022). Even though the number of art students decreased significantly in 2021 due to the pandemic and the college admission exam reform, many high school students still choose art as their major.

A Chinese high school student must pass the Gaokao and the Yikao examinations to enrol in a college-level art programme. According to the Chinese National Ministry of Education, the academic (Gaokao) score of an art-oriented (Yikao) student can be at least 70 per cent of the academic score of a regular student. If the regular student scores 500 on Gaokao, the art-oriented student must score at least 350 to be accepted into the same university (Ding, 2018). In addition to demonstrating at least 70 per cent of the academic proficiency expected of regular Gaokao students, art students must also perform well on the Yikao. In China, the Yikao score often accounts for 60 per cent of the admissions process for "arts-oriented" high school students, while the Gaokao score accounts for 40 per cent (Ding, 2018). This nearly doubles the challenge for art students, as they must study at least 70 per cent of academic materials and achieve the same level of art proficiency as their peers who only followed "normal" academics.

To qualify for the Yikao, a student must possess artistic mastery in music, dance, fine art, or acting. In contrast to math, language, and science topics, art is typically never taught in depth at conventional high schools. Thus, an unusual circumstance develops art students must seek education outside the high school to prepare for the Yikao exam. It is hardly unexpected that high school ACI students report attending weekly extracurricular classes in their chosen art form. "75.5% of Yikao students spent more than 50,000 Yuan every semester on "Yikao training," and 19.2% spent between 30,000 and 50,000 Yuan" (Liu, 2020).

Technology in Art Education

Arts education in China has included technology for some time and is categorised into two stages (Zhao & Xu, 2010). From 1986 through 2000, schools and teachers ordered technology hardware, such as computers and printers. Second, since the year 2000, the efficacy of technology in education has increased substantially, and teachers' technological proficiency has increased. The Chinese government has established numerous technical arts education policies and programmes (Zhao & Xu, 2010).

The Chinese government declares that the technologist of education should be part of the state's strategy for comprehensive computerisation. By 2020, all schools in urban and rural areas will be covered by a nationwide network of online education services to promote the modernisation of teaching content, pedagogy and methodology. Secondly, the use of technology is to be popularised throughout the population. Finally, China sets requirements for essential data management in schools to accelerate the computerisation and standardisation of school operations.

Wei (2013) pointed out that the traditional Chinese art education model is 'teaching'. However, using technology in arts education is to optimise the teaching-learning process. Regardless of the traditional or modern models of art education, it would lead to the technologising of art education in China if art teachers could use technology to make this teaching-learning process as perfect and effective as possible. Teachers' behaviour is crucial because they are the main actors in visual and fine arts teaching-learning. Digital literacy involves an individual's interest, attitude, and ability to appropriately use digital technologies and communication tools to access, manage, integrate, analyse and evaluate information, create new knowledge and communicate with others (Premier's Technology Council, 2010).

Technology Pedagogical Content Knowledge (TPACK)

To successfully deploy technology in education, a vast body of research suggests that the content of a module must be tailored to the technology chosen and the pedagogical strategy employed (Rienties et al., 2013). The Technological Pedagogical Content Knowledge (TPACK) model offers educators a conceptual framework for efficiently designing and implementing technology-enhanced learning (Mishra & Koehler, 2022). The TPACK model is based on Shulman's pedagogical content knowledge (PCK) concept in 1986. In 2008, PCK was enhanced to its present form (M. J. Koehler et al., 2017).

Seven components are defined in TPACK, which are pedagogical knowledge (PK), technological knowledge (TK), pedagogical content knowledge (PCK), content knowledge (CK), technological pedagogical knowledge (TPK), technological content knowledge (TCK), and lastly, is Technological Pedagogical Content Knowledge (TPACK) (M. J. Koehler et al., 2017).

Content Knowledge

Teachers' content knowledge is their knowledge of the subjects they teach. Fundamentally, it refers to the topic being taught (Harris et al., 2014; M. J. Koehler et al., 2017; Schmidt et al., 2009) and, in particular, the breadth and depth of instructors' content-area knowledge. It has also been described as teachers' knowledge of the facts and concepts of their respective disciplines (Hughes & Hughes, 2005). This is essential knowledge for educators (M. J. Koehler et al., 2017). According to Shulman (1986), this knowledge comprises their understanding of concepts and ideas.

Pedagogical Knowledge

Pedagogical knowledge pertains to the teaching strategies employed by educators. In other words, it is an in-depth understanding of teaching. It also relates to learning how students learn (Harris et al., 2014; M. J. Koehler et al., 2017; Mishra et al., 2011), which can involve learning theories and cognitive development (Hughes & Hughes, 2005). This information encompasses the approaches teachers implement in their classrooms and their understanding of how students develop knowledge and gain skills (Harris et al., 2014).

Technological Knowledge

As technology evolves and develops, any definition of technological knowledge will quickly become obsolete (M. J. Koehler et al., 2017; Mishra et al., 2011; Mishra & Koehler, 2022). Technological knowledge is " how to employ developing technology" (Cox & Graham, 2009). This constantly expanding knowledge encompasses cutting-edge digital tools and conventional technologies such as the whiteboard (M. J. Koehler et al., 2017).

Technological Pedagogical Knowledge

Technological pedagogical knowledge is understanding how instructors' and students' approaches to teaching and learning change when technology is deployed in particular ways (M. J. Koehler et al., 2017). It has been described as how technology influences teachers' pedagogical approaches and how they implement their chosen technology (Abbitt, 2014; Ling Koh et al., 2014). This is especially crucial because most technologies still need to be developed for instructional purposes.

Therefore, implementation necessitates modifications and tweaks to determine the most effective educational approaches. Teachers must go beyond merely utilising the common aspects of technology and reject their fixed nature and instead consider ways to customise them to fulfil the aim of their lessons. Instructors should be innovative and receptive to new concepts; therefore, they should accept this challenge (M. J. Koehler et al., 2017). In addition to the primary objective of understanding the capabilities of the chosen technology to be utilised in their instructional processes, this is also a goal (M. J. Koehler et al., 2017).

Knowledge of technological pedagogy may also involve the ability to encourage and engage pupils in learning more effectively with technology. Teachers must refrain from focusing on how technology is utilised for educational purposes and instead look beyond their common application.

Technological Content Knowledge

Technological content knowledge (TCK) pertains to the reciprocal relationship between content and knowledge (Abbitt, 2014; M. J. Koehler et al., 2017). It understands how technology and content duties complement or conflict with one another. Teachers must learn which technologies best suit their disciplines and how they will assist them in presenting or teaching subject knowledge to their pupils (Harris et al., 2014). TCK essentially comprises the perception of how technology influences instructors' practises when building technological instruments for educational objectives and how the subject matter is modified after implementing this technology (M. J. Koehler et al., 2017). Examining the topic matter is the most effective method for determining which technology to employ.

However, it is essential to recognise that content might occasionally restrict the technologies that can be successfully implemented. Therefore, teachers must comprehensively understand which technologies best benefit their courses (M. J. Koehler et al., 2017). Simultaneously, the use of technology offers subject matter presentations that are more diverse and contemporary. The subject taught influences how educational technologies are utilised more than the technological instruments themselves (Harris et al., 2014)

Pedagogical Content Knowledge

Pedagogical content knowledge (PCK) refers to how teachers teach their students the subject matter based on their understanding of the material. The resources teachers draw on determine how to teach the topics covered to students to achieve the learning objectives. PCK looks at the pedagogical method of using specific information and what makes it easy or difficult for students to acquire a particular topic (M. J. Koehler et al., 2017).

This subject knowledge involves using activities and representations of the subject to facilitate student learning. This pedagogical expertise is subject-specific rather than general. Teachers must comprehensively understand the benefits of activities in the classroom and how they help students learn effectively and master the subject matter (Cox & Graham, 2009).

The relationships between TPACK and teachers' knowledge and skills

When incorporating new technologies, teachers should be familiar with flipped learning, a pedagogical concept introduced in 2006 that can support student-centred learning, teacher role change and institutional change (Hutchings & Quinney, 2015). This is an instructional strategy in which teachers reverse traditional classroom learning so that students become familiar with the subject matter at home by using technology and improving their understanding through classroom conversations (Mazur et al., 2015). In this scenario, teachers need to guide students to engage with the subject through personal interest outside the classroom (Bledsoe & Pilgrim, 2015) to develop more personalised and individualised instruction (Berson et al., 2012) and promote collaborative learning (Burden et al., 2012; Hashim, 2014).

This new educational paradigm requires incorporating technology, new skills and capacities to enhance student learning (Oyanagi & Satake, 2016). Teachers must have the knowledge and skills to combine technology with content and pedagogy to improve teaching and learning processes to create student-centred learning environments. Teachers who need essential knowledge or skills to integrate technology successfully may need support (Harris et al., 2014; M. Koehler et al., 2009; M. J. Koehler et al., 2017; Mishra & Koehler, 2022). The TPACK framework is beneficial because it identifies the different areas of knowledge teachers need to acquire to integrate technology into their profession. If teachers are to develop the necessary skills to use technology, e.g. technical skills, professional skills, cognitive skills and digital literacy, researchers believe that training is crucial (Avidov-Ungar & EshetAlkalai, 2011; Lehiste, 2015). Training can help teachers connect technical skills to the subject matter and classroom practice (Harris & Hofer, 2009). They must also move from teacher-centred, lecturebased instruction to student-centred, interactive, constructivist learning. In moving from a teachercentred model to one where the teacher is the facilitator, teachers need ongoing professional development to acquire technical skills and implement new pedagogical approaches to improve teaching and learning (Lehiste, 2015).

Unified Theory of Acceptance and the Use of Technology Model (UTAUT Model)

UTAUT is one of the most comprehensive technology adoption models, as it integrates components from eight major theories/models of information technology research. The UTAUT model was validated with performance expectancy (PE), effort expectancy (EE), social influence (SI) and facilitating conditions (FC) as the main determinants of technology adoption. The authors reported the role of UTAUT in explaining information technology use behaviour and advised researchers to validate and test the model with different technologies, participants and contexts (Venkatesh et al., 2003).

UTAUT2 is an extension of UTAUT and includes Hedonic Motivation (HM), Price Value (PV) and Habit (HT), i.e. a total of seven separate components (variables). Usage behaviour (USE) is the dependent variable, while behavioural intention (BI) is the mediating variable. Age, gender and experience (individual differences) attenuate the effects of these factors on BI and technology use according to the UTAUT2 model. UTAUT2 can be used in the introductory phase of the target technology (e.g. adoption, first use) (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Performance Expectancy (PE)

In the context of this study, Performance Expectation is the strongest predictor of Behavioural Intention (BI) to use technology. Performance Expectation is a fundamental component that determines the adoption and use of the relevant technology. It is the degree to which teachers believe that technology will assist them in achieving their instructional objectives and improving their performance (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Effort Expectancy (EE)

Effort Expectation is a driver of personal intention regarding using new technology in this study; it is related to instructors' expectations of the ease of technology in their teaching (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Social Influence (SI)

Social Influence refers to teachers' impressions of others (colleagues, school principals, or consultants) beliefs about them; in this case, these beliefs are related to teachers' use of technology in the classroom (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Facilitating Conditions (FC)

Facilitating Conditions indicate teachers' perceptions regarding suitable organisational and technological infrastructure to facilitate the use of technology in their classrooms (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Hedonic Motivation (HM)

Hedonic Motivation is used as a synonym for enjoyment perception. This study focuses on the pleasure/enjoyment arising from the use of technology by instructors in the classroom (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Price Value (PV)

Price Value is hypothesised to predict teachers' propensity to use technology; in this study, it is associated with perceptions of the worth of technological access (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Habit (H)

Habit is measured by the degree to which a person considers a behaviour to be automatic (because of learning). It predicts both intention and technology use; this study demonstrates the impact of prior technology usage experiences (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Behavioral Intention (BI)

Behavioural Intention was found as a critical predictor of actual technology use in several intention models; here, it is the amount to which instructors intend (and continue) to use technology in their classrooms (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Use Behavior (UB)

In this study, "Use Behavior" refers to teachers' actual technology usage for educational reasons (Venkatesh, Thong, et al., 2012; Venkatesh, Walton, et al., 2012; Venkatesh & Zhang, 2014).

Integration of TPACK and UTAUT2

This study used the UTAUT2 (Venkatesh, Thong, et al., 2012; Venkatesh & Zhang, 2014) and TPACK models because they examined different areas of interest: UTAUT2 constructs were unique to introducing and using technology in arts education. In contrast, TPACK constructs were areas of knowledge related to technology, pedagogy, and content. Some elements from the UTAUT2 and TPACK models were found to be a good theoretical fit for examining teachers' views of technology art tools and their intentions, providing the conceptual framework for this study.

Proposed Model

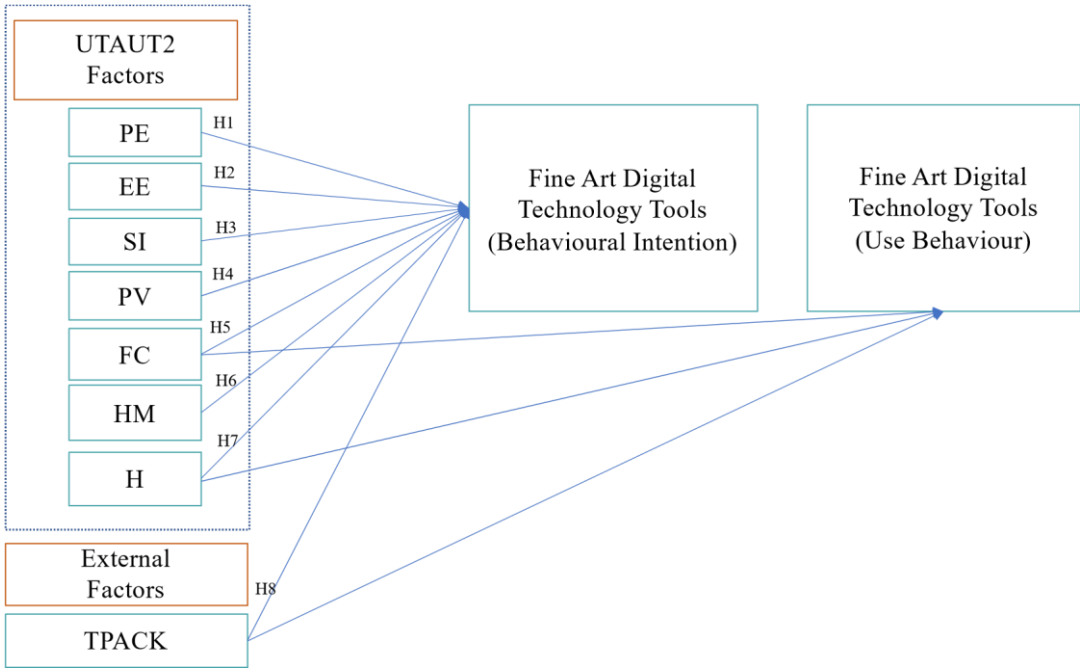

Figure 1. Proposed Model Framework

Hypothesis

This study proposes the following hypothesis:

H1: Performance expectancy positively influences Fine Art teachers' behavioural intention of Digital Technology Fine Art tools.

H2: Effort expectancy positively influences Fine Art teachers' behavioural intention of Digital Technology Fine Art tools.

H3: Social Influence positively influences Fine Art teachers' behavioural intention of Digital Technology Fine Art tools.

H4: Facilitating Condition positively influences Fine Art teachers' behavioural intention and use behaviour of Digital Technology Fine Art tools.

H5: Hedonic Motivation positively influences Fine Art teachers' behavioural intention of Digital Technology Fine Art tools.

H6: Price Value positively influences Fine Art teachers' behavioural intention of Digital Technology Fine Art tools.

H7: Habit positively influences Fine Art teachers' behavioural intention and use behaviour of Digital Technology Fine Art tools.

H8: TPACK as external factors influences Fine Art teachers' behavioural intention and use behaviour of Digital Technology Fine Art tools.

SIGNIFICANCE OF THE STUDY

The research findings are anticipated to provide policymakers, such as the Ministry of Education and school administration, with insight and information for drafting and implementing policies to understand the technology acceptance behaviour and increase the usage of Fine Art Digital Technology Tools. Moreover, by understanding the technology acceptance behaviour, academicians can seek solutions to improve the use and enhance their intended behaviour.

DISCUSSION

This paper is the overview of the planned research by researcher based on the literature review that the researcher has studied. Based on this study, the researcher identified that integration of the UTAUT2 and TPACK factors could be conducted as this research previously done by another researcher to study the technology acceptance behaviour (Mohammad-Salehi et al., 2021; Nikolopoulou et al., 2021; Zhang et al., 2021).

CONCLUSION

Researcher proposed a model to examine the how Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, Hedonic Motivation, Price Value, Habit, or TPACK on teachers' influence of Behavioral Intention to use Fine Art Digital Technology Tools and Behavioral Intention, Facilitating Conditions, Habit, or Technological Pedagogical Knowledge influence teachers' Fine Art Digital Technology Tools use behaviour. The variables under study are UTAUT2 Factors with the external factors, TPACK.

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