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Technology Acceptance Model as Explanatory Factor Influence the Use of Digital Technology by Ideological and Political Teachers in Universities

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Abstract: The aim of this study is to provide educational administrators with information on the factors that influence the willingness of ideological and political education (IPE) teachers to use digital technology in their teaching. This can be explained by the Technical Acceptance Model (TAM). By examining the impact of perceived ease of use, perceived usefulness, and attitude on the intention to use digital technology in teaching, this study elucidates the key factors influencing the willingness of ideological and political education teachers to use digital technology in teaching, and addresses the intention behavior gap in technology adoption. By identifying these factors, educational institutions can better enhance their understanding of the relationship between technology availability, practicality, and adoption decisions, prepare teachers to utilize digital technology, and thus improve the quality and effectiveness of IPE.

1. Introduction

In the context of digital transformation in education, ideological and political theory courses in higher education face new opportunities and challenges. To enhance the attractiveness and quality of these courses, it is imperative for them to actively adapt to the changes of the times and integrate deeply with digital technology. This integration can significantly boost students' interest and engagement, and foster innovation and diversity in teaching content (Zhao et al., 2020)[1]. This shift requires educators to continuously enhance their digital literacy and adopt advanced teaching tools and methods to meet the needs of contemporary students (Huang et al., 2021)[2].

The development of digital capabilities among university teachers is influenced by various factors. Only by identifying the key factors affecting their digital capabilities and exploring the mechanisms through which these factors operate can we provide a basis for formulating strategies to enhance university teachers' digital capabilities. Currently, there is a lack of research on teachers'

digital capabilities in China, and studies specifically focusing on university teachers' digital capabilities are even rarer. This has, to some extent, restricted the development of digital capabilities among university teachers (Wang, 2020)[3].

This study aims to explore how Perceived Usefulness (PU), Perceived Ease of Use (PEU) and Attitude (AT) influence the Intention to Use digital Technology (IUT) of Chinese IPE teachers in their teaching practices. By identifying the key factors affecting the adoption of digital technology, this research can inform targeted professional development programs and supportive policies. Consequently, it can enhance IPE teachers' digital literacy and improve the quality and effectiveness of IPE in China.

2. Literature Review

In this section the researcher will discuss relevant theories that are essential to incorporate into this study. These theories play a crucial role in ensuring high quality results, as they serve as preparatory groundwork prior to data collection and analysis, as well as prior to participants engaging in the assigned tasks.

2.1 Digital Technology

With the vigorous rise of digital technologies such as AI, cloud computing, and big data, digital technology has become an important opportunity for all walks of life to pursue digital value dividends and achieve rapid growth (Zheng, 2011)[4] Digital technology refers to the process of using digital technology to achieve business optimization, process improvement, efficiency improvement, and value creation. For schools, the efficiency improvement, social synergy, and optimization of resource allocation brought about by digital technology have provided new applications and new momentum for the high-quality development of schools.

In the context of IPE, digital technologies have been used to create more interactive and engaging learning experiences. Digital platforms can provide students with access to a wide range of ideological and political resources, including articles, videos, and online discussions, which can help them gain a deeper understanding of political concepts and ideologies (Zhang et al., 2023)[5]. Moreover, digital technologies can facilitate the delivery of IPE courses through online platforms, making them more accessible to students who may not be able to attend traditional classroom-based courses (Means et al., 2024)[6].

2.2 The Ideological and Political Education

IPE is an important part of the school's IPE work, and it is also an important part of the school's student affairs management. IPE is “a social practice activity in which students' ideological and political educators cultivate college students' ideological and political morals in a purposeful, planned and organized manner in accordance with the requirements of my country's social development and the laws of students' IPE” (Fang, 2014)[7]. It refers to “a social practice activity in which a society or a social group uses ideological, political and moral concepts that meet the needs of a certain social class to exert an organized, purposeful, and planned influence on social personnel and standardize their ideology and morality” (Deng, 2021)[8].Future research and practice in IPE should focus on developing more interactive and engaging teaching methods. Utilizing digital tools and platforms can significantly enhance the reach and impact of IPE, making it more accessible and appealing to a broader student audience (Gao et al., 2018)[9].

2.3 Digital Transformation of Ideological and Political Education

The rapid development of digital technology has driven profound changes in the political, economic, social, and cultural fields, significantly affecting the ideological and political education in universities. The needs and behavior patterns of students, the primary subjects of education, have evolved significantly with the advent of digital technology. Modern students increasingly rely on digital tools and platforms for their learning activities. This shift has led to more diverse and flexible means of information acquisition and cognitive processing. Digital platforms like online forums, social media, and educational websites provide students with a wealth of resources that can be accessed anytime and anywhere, promoting a more self-directed and personalized learning experience (Zhang, 2021)[10]. The flexibility and accessibility of these digital tools cater to the varied learning styles and paces of different students, thereby enhancing overall educational effectiveness (Wang et al., 2019)[11].

2.4 Influencing Factors

Influencing factors are variables or conditions that can affect the outcomes or processes within a particular system or context (Steffen, 2018)[12]. These factors can be internal or external, and they can influence various domains such as economics, education, healthcare, and environmental science. In research, identifying and analyzing influencing factors is crucial for understanding causal relationships and for developing strategies to optimize outcomes (Marmot, 2019)[13].

2.5 Theories Framework

The TAM delineates individuals' attitudinal dispositions towards technological systems, categorizing them based on positive or negative evaluations concerning their intent to utilize a given system. These evaluative dispositions are principally mediated by two determinants: the perceived utility and the perceived ease of operation associated with the technology. Originally conceptualized by Davis in 1986, TAM posits that the perceived ease of system operation not only directly correlates with the intention to employ it but also indirectly shapes the perceived utility of the technology. Moreover, an individual's intention to adopt a system is contingent upon their attitudinal disposition towards it and its perceived utility. These inclinations, sequentially, predict the actualized interaction with the system.

While many technology acceptance paradigms have gained the global acknowledgment and application, TAM is distinguished by its succinctness and efficacy, especially in collating expansive insights regarding technological engagement perspectives. This characteristic was accentuated in a comprehensive meta-analysis undertaken by Legris et al. in 2003.

TAM is a popular and strong model used to understand why users accept or reject technology and is prominently recognized as a predominant framework in scholarly investigations seeking to elucidate and forecast individual technology adoption predicated on users' perceptual evaluations (Bedregal-Alpaca et al., 2019[14]; Legramante et al., 2023[15]). It suggests that if people find something easy to use and helpful, they're more likely to use it. External factors also play a role, but how easy and useful they perceive the technology to be is key (Coelhoso, 2019)[16]. Researchers often use TAM theory to identify factors that influence users' intentions to adopt a technology (Mustafa, 2021)[17]. According to the TAM theory, an individual's PU and PEU of a specific technology will affect the user's Attitude, thereby affecting the intention and behavior to use the product (Davis, 1989)[18].

Elaborating on the framework of TAM, it is predicated on five foundational variables. A subsequent section will provide an in-depth examination of each constituent of TAM:

Perceived Ease of Use (PEU): This refers to the extent to which individuals believe they can understand and operate computer systems without undue effort (Davis, 1989)[18].

Perceived Usefulness (PU): This dimension represents an individual's belief that utilizing a particular application can augment the efficiency and effectiveness of their job tasks (Davis, 1989)[18].

Attitude Toward Using (AT): This denotes an individual's affective evaluation, encompassing both positive and negative sentiments, associated with engaging in a specific behavior (Natalia, 2004)[19].

Behavioral Intention to Use (B): This captures an individual's predisposition to persistently engage with technology, reflecting their anticipated future interactions (Davis, 1989)[18].

Actual System Use (AU): This reflects the practical engagement with a system. An individual's satisfaction with the system, stemming from its PEU and potential to enhance productivity, correlates with the tangible instances of system utilization (Natalia, 2004)[19]. In this study, the objective was to explore the influencing factors of IPE teachers' IUT, and the research scope did not include Actual System Use. Therefore, this variable was not used in subsequent studies.

3. Research Hypothesis

3.1 Perceived Usefulness Positively Impacts Intention to Use Technology

Fasima et al. (2015)[20] expande TAM to examine faculty use of LMS In Higher Education Institutions, describing this influence as users acquiring a positive intention to use a technology when they find it useful. This influence/relationship has been empirically confirmed in previous technical education research (Al-Hattami, 2023)[21].Sánchez-Prieto et al. (2017)[22] conducted a study on the use of mobile devices and 678 participants were elementary school teachers with a bachelor's degree. Results indicate a strong relationship between PU and behavioral intentions. Yadegaridehkordi et al. (2019)[23] conducted a study involving 209 respondents from four leading Malaysian universities to explore the decision-making process regarding the adoption of online collaborative learning tools in higher education. Their findings indicate that the intention to adopt these tools is significantly influenced by perceived usefulness (PU). Based on these research findings, the following research hypotheses are proposed:

H1. There is a significant relationship between PU and IUT.

3.2 Perceived Usefulness Positively Impacts Attitude

PU is “the extent to which a person believes that using a particular system will improve his or her job performance” (Davis, 1989)[18]. The TAM posits that PU positively influences both attitude toward using (AT) and behavioral intention (BI). Fasima et al. (2015)[20] expanded TAM to investigate faculty use of Learning Management Systems (LMS) in higher education institutions, highlighting that users tend to develop a positive attitude and intention to use a technology when they perceive it as useful. This relationship has been empirically validated in previous research on technology in education (Al-Hattami, 2023)[21]. Alshurafat et al. (2021)[24] examined the factors influencing accounting students' use of online learning systems in Jordanian public universities, drawing on Social Cognitive Theory (SCT), the Theory of Reasoned Action (TRA), and TAM. Multiple studies have shown that PU is one of the important factors influencing users' attitudes towards using technology (Hamid et al., 2016[25]; Mou et al., 2017[26]). Therefore, based on the above research findings, the following research hypotheses are proposed:

H2- There is a significant relationship between PU and Attitude.

3.3 Perceived Ease of Use Positively Impacts Attitude

In the context of library resource format selection, Yoon (2016)[27] investigated the factors influencing the acceptance of mobile library applications among academic library users and found a positive relationship between PEU and personal Attitudes toward mobile library applications. Additionally, numerous studies have confirmed the importance of PEU as a key predictor of attitudes toward technology acceptance (Abdullah & Ward, 2016[28]; Briz-Ponce & Garc á-Pe ñalvo, 2015[29]; Calisir et al., 2014[30]; Mailizar et al., 2021[31]). Alshurafat et al. (2021)[24] investigated the factors influencing the use of online learning systems among accounting students in Jordanian public universities, utilizing Social Cognitive Theory (SCT), the Theory of Reasoned Action (TRA), and the TAM. Their study found that PEU is a significant predictor of attitudes toward use decisions. Based on these research findings, the following research hypotheses are proposed:

H3 PEU can positively impact Attitude.

3.4 Perceived Ease of Use Positively Impacts Intention to Use Technology

Mailizar et al. (2021)[31] investigated the factors influencing experienced teachers' intention to use e-learning in teaching mathematics, using a questionnaire completed by 161 secondary school mathematics teachers. Yadegaridehkordi et al. (2019)[23] conducted a study with 209 respondents from four top Malaysian universities to explore the decision to adopt online collaborative learning tools in higher education, finding that the intention to adopt these tools is significantly influenced by PEU. Wong (2015)[32] demonstrated that PEU has a direct effect on the behavioral intention to use technology. Based on these research findings, the following research hypotheses are proposed:

H4- There is a significant relationship between PEU and IUT.

3.5 Attitude and Intention to Use Technology

Al-Hattami (2023)[21] employed the TAM to study the perceptions of Yemeni university academics regarding the adoption and integration of technology in accounting education, concluding that PU is significant in determining behavioral intention. Mailizar et al. (2021)[31] examined the factors influencing experienced teachers' intentions to use e-learning in their mathematics teaching, utilizing a questionnaire from 161 secondary school mathematics teachers. Their study found that attitude toward e-learning use was the most significant construct in predicting e-learning utilization. These findings suggest that attitude is a crucial predictor of students' intention to use e-learning. Based on these research findings, the following research hypotheses are proposed:

H5- There is a significant relationship between Attitude and IUT.

4. Research Methodology

4.1 Research Design

This study is grounded in an empirical research paradigm that emphasizes theory covering a broad sample. This paper uses technology acceptance theory to study the influencing factors of my country's IPT' intentions to use digital technology. Due to the limitations of qualitative methods in examining relationships between variables, a quantitative approach was chosen for this study. This method can accurately measure and analyze the interrelationships between factors that influence intentions to use digital technologies.

Survey research is a widely used method in quantitative research (Creswell, 2013)[33]. It is

generally considered a reliable and straightforward investigative strategy (Saunders et al., 2016)[34]. This study utilized survey methods to obtain standardized data on various variables and their interrelationships. The survey questionnaire uses closed ended questions. To address issues such as ensure clarity of responses, all of the questions were closed-ended, requiring respondents to choose from the options provided. Ratings were conducted using a Likert scale from 1 to 5 (strongly agree, agree, neutral, disagree, strongly disagree), thereby increasing the complexity of the survey in terms of completion, data recording, and analysis.

4.2 Population of Study

In this particular study, the aim is to explore the factors that influence the intention of Chinese IPT to incorporate digital technology into their teaching practices. Therefore, the population of this study is specifically defined as individuals currently serving as IPT in Chinese universities, and these teachers also need to meet the condition of having taught IPTC in the past two years. This standard not only specifies the occupations of the population sample, but also ensures that the population sample has sufficient teaching experience and expertise, providing quality assurance for achieving research objectives.

4.3 The Sampling Technique

This study primarily used purposive sampling. Purposive sampling has strong targeting and helps to select samples with specific characteristics or experiences that can provide the most relevant and meaningful insights for research topics. Compared to random sampling, purposive sampling can quickly find participants who meet the research requirements, saving time and resources. The population sample of this study is IPE teachers from universities across the country, with a wide and targeted range of population samples. This method helps to gain a deeper understanding of the behavior, Attitudes, and perspectives of specific groups. Moreover, where the researcher used their own judgment and specific criteria to select participants best suited to answer the research questions and achieve the study objectives (Saunders et al., 2016)[34]. Selection criteria include:

1) Respondents must be Chinese citizens.
2) They must be IPE teachers from various higher education institutions in China.
3) They must have at least two years of experience teaching IPTC.

4.4 The Sampling Size

Determination of sample size is influenced by a variety of factors, including study complexity, available time and resources, population size and accessibility, estimation procedures, and expected rates of missing data (Hair et al., 2010)[35]. According to statistics, as of November 2021, the number of registered full-time and part-time teachers of IPTC in Chinese universities in the database has reached 127000, with over 91000 full-time teachers. Considering the issue of a large population size, this study uses Krejcie and Morgan's (1970)[36] sample size determination table, which recommends a minimum sample size of 382 with a 95% confidence interval for a population estimated to exceed 75,000. Figure 1 shows a table for determining the sample size of a known population.

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	1000000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

Figure 1: Table for Determining Sample Size of a Known Population

Response rate is also a key factor in determining sample size. To account for potential unqualified responses and ensure a robust sample size, Bartlett, Kotrlik, and Higgins (2001)[37] suggest increasing the sample size by 10%-20% above the minimum to accommodate nonresponse and incomplete surveys. Considering the expected response rate of 85%, based on previous studies (Dillman, Smyth, & Christian, 2014[38]; Groves & Peytcheva, 2008[39]), the appropriate sample size after adjustment for this study is 450 (382/85% = 450). Therefore, further adjustments are needed to take into account response rate variability, sample diversity, and data reliability. Additionally, it is more convenient and cost-effective to use online surveys and send out large numbers of questionnaires. Therefore, after comprehensive consideration of these factors and the current epidemic situation, and after consultation with experts, it was decided to issue 500 questionnaires.

4.5 Findings from the Pilot Study

Pre-testing and pilot testing are an integral part of questionnaire development and are critical safeguards against potential errors and weaknesses. Reynolds & Diamantopoulos (1998)[40] emphasize the need to resolve any issues with these tests before commencing data collection. This pre-emptive approach is critical to ensuring the reliability and validity of research instruments before dissemination to a wider audience.

Pretesting of this study was conducted by distributing a draft questionnaire to a panel of at least three experts. The task of these experts is to evaluate the consistency between the questionnaire and the research objectives, particularly its relevance to IPE. They reviewed and evaluated the draft questionnaire separately, assessed the appropriateness of the terminology used, and gave positive feedback on the structure and content of the questionnaire.

The pretest was followed by a pilot test as outlined by Zikmund et al. (2013)[41], to further identify and address any weaknesses in the questionnaire. Pilot testing represents a more comprehensive evaluation that includes changes to instrumentation, procedures, sampling methods, and other aspects of the research process. Stover et al. (1996)[42] suggested that pilot testing should

ideally involve a subject group of 25-40 people, depending on the total number of subjects in the planned study. Insights gained from the pilot survey, including participant feedback, play a crucial role in determining whether the questionnaire needs to be revised or completely redesigned.

This study was experimentally tested on 30 respondents according to the method proposed by Hertzog (2008)[43]. This step is crucial to verify the validity of the questionnaire and identify areas for improvement. After the experimental testing, a preliminary study was conducted using the statistical software SPSS to analyze the collected data. This comprehensive approach, including pre-testing and pilot testing, ensured that the questionnaire was thoroughly reviewed and refined before widespread use in the main study, thereby improving the overall quality and accuracy of the study results.

According to Nunnally and Bernstein (1994)[44], the internal consistency of measurement items in a questionnaire is considered satisfactory if the Cronbach's α value exceeds 0.70. This threshold is a standard benchmark in research for assessing the reliability of a set of measurement items, indicating that the items consistently measure the same underlying construct. The results of the pilot test were encouraging, indicating that all variables in the questionnaire achieved the necessary level of internal consistency, as indicated by Cronbach's alpha values of 0.70 or higher. This finding is systematically documented in Table 1 of the study, which details the reliability values for all variables considered. This table is important evidence to support the reliability of the questionnaire and reflects the meticulous approach taken by this study to ensure the validity and reliability of the questionnaire.

Table 1: Results of the Pilot Study

	Final study (n=30)	
Construct	No. of Items	Cronbach's Alpha
PU	6	0.67
PEU	6	0.74
Attitude	5	0.64
IUT	8	0.80

Overall, the combination of expert review in the pre-test phase and empirical testing in the pilot phase resulted in a comprehensive evaluation of the questionnaire. This rigorous process ensured that the research instruments were not only conceptually sound and contextually relevant, but also empirically reliable, providing a solid foundation for data collection and analysis in subsequent stages of the study.

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