

# The role of the exposure of education technology on learners' internet self-efficacy

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**Abstract.** The advancement of educational technology has undoubtedly had a influence on how teachers present learning materials and interact with students in the language teaching context over the last few decades. Despite the fact that many studies have been conducted in the field of educational technology, few of them have focused on the relationship between educational technology and internet self-efficacy. Based on social cognitive theory, which views learners as active agents who can not only affect but also be affected by environment, the purpose of this research is to evaluate how exposure to educational technology impacts learners' internet self-efficacy. Furthermore, this research explores how potential variables such as gender, grade, and discipline influence learners' internet self-efficacy. Seventy-one students from a Chinese vocational institute were asked to finish the College Students' Internet Learning Self-efficacy Questionnaire (Xie, 2011) and a questionnaire designed on the basis of the AECT committee's definition, and some participated in a semi-structured interview. The findings indicate that the relationship between exposure to educational technology and learners' internet self-efficacy has significantly facilitated our understanding of how to improve teaching and learning with educational technology. The implication of this study is that when incorporating educational technology into English teaching, teachers should consider the quantity, quality, and methods.

**Keywords:** educational technology; internet self-efficacy; vocational institutes.

## 1. Introduction

Over the past few decades, the development of educational technology has undoubtedly exerted a remarkable impact on how teachers present instructional material and interact with learners in the language teaching context. Especially the pandemic has accelerated the advancement and application of online educational technology in language teaching due to the restriction on in-person meetings (Li, 2022; Moorhouse & Kohnke, 2021; Tafazoli & Meihami, 2022). In this sense, learners are expected to improve their technology skill set as well as their corresponding internet self-efficacy to efficiently adapt themselves to this new learning environment in this digital era (Bandura, 2012; Blanco et al., 2020; Joo et al., 2000).

The term self-efficacy, as defined by Bandura (1997), refers to "the beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments" (p. 3). The four main factors that affect a person's self-efficacy, according to Bandura (1997), are enactive experiences, vicarious experiences, verbal persuasion, and physiological indicators. It is further claimed that perceived self-efficacy contributes to a wide variety of individual behaviors, including changes in coping behavior produced by different modes, physiological stress reactions, self-regulation, growth of intrinsic interest, and choice of career pursuits, which play a role in learning outcomes (Bandura, 1997). This study was conducted in the context of online teaching because self-efficacy has a meaningful impact on learners' academic performance. For example, in the online teaching process, although face-to-face instant communication is lacking, the learning effect could be compensated if students have a strong sense of self-efficacy.

Empirically, a meta-analytic review of thirty-nine educational studies concludes that self-efficacy beliefs are positively related to students' learning persistence and academic performance in the contexts of different subject areas, experimental designs, and grade levels (Multon et al., 1991). Bandura (1997) also finds that students with good self-efficacy are inclined to participate more readily,

work harder, persist longer, and have more positive emotional reactions when encountering difficulties than those who doubt their capabilities. Therefore, self-efficacy, to a certain degree, outweighs the required knowledge and skill for learners to perform a task and get it done, especially when facing obstacles.

Regarding the research perspective, reviewed by Tsai et al. (2011), another cluster of 46 papers from 1999 to 2009 regarding self-efficacy in Internet-based learning environments demonstrates primary research focuses in the previous studies, include 1) learners' internet self-efficacy, assessing learners' confidence in their skills or knowledge of performing general Internet functions or applications in Internet-based learning context; 2) the interplay between learners' general academic self-efficacy and their Internet-based learning outcome.

Overall, as for the research findings, students' self-efficacy has been proven to motivate their engagement and thus improve their learning outcomes in the context of internet-based learning. Regarding research methodology, the previous studies failed to elaborate on the scientific criteria to measure self-efficacy in educational technology, with most studies only involving searching skills in examining internet self-efficacy. In this sense, the previous studies did not integrate educational technology into evaluating internet self-efficacy. In addition, the previous studies mainly selected students in higher education institutes as their samples, without looking at learners in other educational contexts, like vocational institutes. Moreover, few studies focus on what factors contribute to learners' internet self-efficacy. Therefore, exploring the role of exposure to education technology on learners' internet self-efficacy is of great significance, which would offer implications for language teaching practice.

Against this background, utilizing two questionnaires regarding educational technology and internet self-efficacy, this article offers a comprehensive overview of how education technology interacts with learners' internet self-efficacy. To be specific, This study is threefold: (a) to describe the extent of learners' internet self-efficacy and learners' evaluation of the implementation of educational technology in vocational institutes in China; (b) to examine how the potential variables, including gender, grade impact learners' self-efficacy in vocational institutes in China; (c) to explore the correlation between exposure of educational technology and learners' internet self-efficacy.

## **2. Literature Review**

### **2.1. Educational technology**

Over the past years, educational technology research has substantially contributed to our understanding of learning processes (Fonseca et al., 2014; Jesus et al., 2015; Lailiyah and Cahyono, 2017; Zhao, 2003). Specifically, Toetenel & Rienties (2016) state that students' academic achievement to a certain degree could be attributed to learning design in which educational technology has been employed. Due to ongoing technological advancements and developments that impact teaching and learning processes, the definition of educational technology has been constantly changing and evolving. From the first decade of the 20th century to 1963, educational technology was regarded as instructional media—the actual medium by which teaching was delivered to students (Reiser, 2012). In 1963, Educational Technology was termed "Audio Visual Communication"(Ely, 1963, p.22), demonstrating that rather than focusing solely on media, the definition emphasizes the design and messages that govern the learning process. In 1970, educational technology was viewed as "the process that makes up instructional technology; television, film, overhead projectors, computers, and other items of hardware and software" and "a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives" (Commission on Instructional Technology, 1970). However, in 1972, the definition was changed to "a field involved in the facilitation of human learning through systematic identification, development, organization, and utilization of a full range of learning resources and through the management of these processes" (Association for Educational Communications and Technology, 1972, p. 36). A new

concept "a complex, integrated process involving people, procedures, ideas, devices and organization for analyzing problems and devising, implementing, evaluating and managing solutions to those problems involved in all aspects of human learning" (Association for Educational Communications and Technology, 1977, p. 1) was adopted by the Association of Educational Communication and Technology (AECT) in 1977. While many developments impacted the field of instructional technology, the term "Educational Technology" was replaced with "Instructional Technology" in 1994. The 1994 definition of the field divides it into five domains (design, development, utilization, management, and evaluation) or areas of study and practice (Seels & Richey, 1994). The 2008 definition included some key terms, such as ethical practice, facilitate learning, improve performance, technological processes, and technological resources, which were not mentioned in previous definitions, exhibiting the diversity of the field and its potential growth in the coming years. A recent review of research by Ibrahim (2015) stresses the necessity of defining educational technology by discussing the evolutionary nature of it. Given that it reveals the diversity of the field and the path forward, particularly with the requirements of the modern educational classroom environment, this study adopts the 2008 definition proposed by the Association for Educational Communications and Technology. Educational Technology was specified as "the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources" (Association for Educational Communications and Technology, 2008).

There has been an increasing number of studies on the trend of educational technology development (Baydas et al., 2015; Hew et al., 2007; Kucuk et al., 2013; Latchem, 2006; Randolph, 2007; Ross et al., 2010). Researchers mainly addressed learning approaches/theories and learning environments among the related research studies (Baydas et al., 2015). However, studies on the cognitive learning process were identified to be lacking.

According to social cognitive theory, humans are conscious agents who can shape and be affected by their environment (Bandura, 1999). The theory elaborates on how conceptions, judgments, and motivations can affect a person's behavior and the environment that shapes it (Benight & Bandura, 2004; Lent & Brown, 2013). Learners actively regulate their learning by interpreting the results of their actions, which in turn influences their settings and personal factors and informs and modifies subsequent behavior rather than passively absorbing knowledge from environmental inputs (Schunk, 2012).

As a result, it is critical to analyze the relationship between educational technology, conceptions and judgments. A review shows that to some extent, self-efficacy might influence how well online courses work (Bandura, 2002; Bradley, Browne, & Kelley, 2017). Students with higher levels of self-efficacy showed improved performance in online courses (McVay, 2000; Tsai & Tsai, 2003; Roper, 2007;).

## **2.2. internet self-efficacy**

Self-efficacy is defined as individuals' beliefs about their ability to achieve goals successfully and manage environments that affect their lives (Wood & Bandura, 1989) and is a crucial proximal determinant of behavior (Bandura, 1986, 1989, 1997). With the development of technology, to better understand self-efficacy in the context of the internet, the term "internet self-efficacy" was put forward by Eastin and LaRose (2000) and has been widely applied to the field of educational technology. Internet self-efficacy, or the belief in one's capabilities to organize and execute courses of Internet actions required to produce given attainments, appears to be critical in efforts to close the digital divide that separates experienced Internet users from novices (Eastin and LaRose, 2000).

It is important to note that the definitions of internet self-efficacy vary from one expert to another. For example, Tsai and Tsai (2003) define internet self-efficacy as "people's perceptions about their abilities to use the Internet." Tsai (2004) defines it as the "degree of one's perceptions about his or her abilities to use the Internet". Liang and Tsai (2008), and Tsai et al., (2011) define internet self-efficacy as one's "confidence of his/her skills or knowledge of operating general internet instructions or applications on the internet-based learning". Eastin and LaRose (2000) define internet self-efficacy

as "the belief in one's capabilities to organize and execute courses of Internet actions required to produce given attainments." Furthermore, Joyce (2014) defines internet self-efficacy as "a person's belief in their capabilities to achieve specific goals with the Internet". While IGI Global (2021) defines internet self-efficacy as "confidence or one's belief about his/her capability to use the internet" or "one's judgment about his/her capability or level of confidence to use the internet for academic purpose". Though different authors present various definitions, they show the consensus about internet self-efficacy, which refers to one's self-confidence in his/her capability to use the internet in the performance of his/her duty to achieve his/her goals.

In the field of internet self-efficacy, there is also a growing body of empirical studies conducted in Chinese context (Zhang, 2014; Zhang, 2015). For instance, Zhang (2014) examined 498 college students using the self-efficacy questionnaire of e-learning, the perceived social support scale, and the social support questionnaire of e-learning. The results show that the self-efficacy of e-learning of college students is at a medium level. College Students' self-efficacy, real social support, and network social support are positively correlated. College Students' self-efficacy in e-learning can directly predict social support and its dimensions. Furthermore, Zhang (2015) conducted the online self-efficacy scale and the revised online deep learning scale to examine 240 students from Beijing Normal University and Jiangsu Normal University. The empirical exploration was based on three aspects: overall descriptive statistics, differences between online self-efficacy and deep learning in different independent variables (gender, grade, enrolled residence, academic level, time spend online, and correlation between online and deep education. Deep learning refers to a key factor in measuring whether they have the capacity to learn in an effective manner. Consequently, the author claimed that internet self-efficacy can predict deep learning. Taken together, the studies from internet self-efficacy so far were mainly conducted among students of Chinese universities, but only a few studies were conducted in the context of vocational institutes. Overall, the results demonstrate the great potential of studying different variables of internet self-efficacy in Chinese contexts, and further empirical evidence is needed in the specific context.

### **3. Methodology**

Based on social cognitive theory, it is hypothesized that the exposure to education technology is closely related to learners' internet self-efficacy. The specific research questions are as follows:

1. What is the extent of learners' internet self-efficacy in vocational institutes in China?
2. How does the potential variables, including gender, grade, discipline impact learners' internet self-efficacy in vocational institutes in China?
3. What is the correlation between exposure of educational technology and learners' internet self-efficacy?
4. What is the extent of learners' evaluation of implementation of educational technology in vocational institutes in China?

#### *Participants*

This study was conducted in a vocational institute of Guangdong province, and 71 students from the institute were recruited. Students are about 20-22 years old, with 42 males and 29 females. They are from various majors and in grades 1, 2, and 3.

#### *Instruments*

The College Students' Internet Learning Self-efficacy Questionnaire (Xie, 2011) was employed in the study because of its reliable dimensions and scientific validation. The questionnaire (Xie, 2011), implementing Bandura's three-dimensional interaction theory, categorizes Internet learning self-efficacy into four components: sense of ability, sense of effort, sense of the environment, and sense of behavioral control. The cronbach alpha of the questionnaire is 0.921, indicating that it is homogeneous. According to Xie (2011), the most important dimension of internet self-efficacy is the

sense of ability, as well as their expectations of the results and objectives of e-learning. Sense of effort refers to an individual's perception of his or her ability to study hard, regulate himself well, and focus on network learning. Sense of the environment is related to the overall evaluation of the network learning environment and his understanding of whether he can use the network learning environment effectively and turn to others for assistance when necessary. Sense of behavioral control refers to the ability of an individual to manage their learning behavior and internet learning activities.

In order to measure the exposure of educational technology in the English classroom context, a systematic definition of Education Technology proposed by an AECT committee is adopted in this study. On the basis of the adopted definition, three dimensions were applied in the study -- material source (textbook; textbook and internet); type of internet tool (online teaching; computer; mobile tools, email, QQ, we-chat); presentation form (teachers' presentation; passive involvement of learners, active involvement). The scale ranges from low to high on a scale from one to five (1: never; 2: occasionally; 3: sometimes; 4: often; 5: always).

After collecting data, some subjects were selected for a semi-structured interview. The structured part focused on instructional materials and instructional methods. They were asked to answer a series of questions. During the process, based on their responses, questions or structure were modified or elaborated on in a flexible manner. Conducting the interview took approximately 90 minutes for each participant.

#### 4. Results

In this part, the descriptive statistics of students' overall internet self-efficacy is presented first, thereafter followed by the in-depth analysis of four dimensions of internet self-efficacy. Then the role of gender and grade on students' internet self-efficacy and the results is presented in this part.

##### 4.1. The descriptive statistics of students' overall internet learning self-efficacy

**Table 1.** Students' overall internet self-efficacy

Dimension	N	Min	Max	Mean	SD
sense of ability	71	1.0	5.0	3.51	.83
sense of effort	71	1.0	5.0	3.48	.81
sense of environment	71	1.0	5.0	3.61	.79
sense of control	71	1.0	5.0	3.46	.81
overall Internet learning self-efficacy	71	1.00	5.00	3.52	.79

Among the four dimensions of internet self-efficacy, *sense of environment*, ranks the highest with the mean score of 3.61, being higher than the mean value in total (3.52). However, the mean value of other three dimensions are all lower than 3.52 (the mean score of internet self-efficacy), indicating that the majority of the participants express a lack of confidence towards their sense of ability and sense of effort and sense of behavior. Based on the value of standard deviation, the deviations of the four dimensions are lower than 1.00, which means no significant difference exists among the participants'; *sense of ability*, *sense of effort*, *sense of environment* and *sense of control*. In general, the internet self-efficacy of the participants is above the intermediate level.

##### 4.2. The descriptive statistics of four dimensions regarding internet self-efficacy

*Sense of ability* refers to the individual's cognition of their own ability, the expectation of the results and goals, and it is the most important dimension of internet self-efficacy.

**Table 2.** Four dimensions regarding sense of ability

Dimension	N	Min	Max	Mean	SD
Sense of ability-confidence	71	1	5	3.28	1.06
Sense of ability-setting goals	71	1	5	3.41	.99
Sense of ability-downloading material	71	1	5	3.58	.94
Sense of ability-keeping material	71	1	5	3.58	.94
overall sense of ability	71	1	5	3.70	.98

As shown in the table, the mean values of downloading material, mastery of technology and keeping material are higher than the total mean value (3.51) of the first dimension. Among them, *keeping material* (mean value=3.58) ranks the first, which implies the participants show a confidence of their ability to keep learning material. However, most of the participants show a lack of confidence toward their overall ability, ranking the last among the five items with the mean of 3.28, much lower than the mean value 3.51. It can be concluded that most of the students are not confident with their ability to implement Internet technology and the level of student's Internet technology needs to be improved to some extent. In addition, the standard deviation (SD=1.058) of confidence is relatively higher than other items, more than 1.00, demonstrating participants vary to each other for this statement.

*Sense of effort* consists of five items (solving solutions, setting schedules, helping classmates, studying Internet knowledge and asking for advice). The detailed analysis of each item is presented as follows:

**Table 3.** Four dimensions regarding sense of effort

Dimension	N	Min	Max	Mean	SD
Sense of effort- solving solutions	71	1	5	3.48	.98
Sense of effort-setting schedules	71	1	5	3.38	.95
Sense of effort-helping classmates	71	1	5	3.44	.92
Sense of effort-studying Internet knowledge	71	1	5	3.54	.94
Sense of effort- asking for advice	71	1	5	3.56	.89
overall sense of ability	71	1	5	3.48	.81

As shown in the table, the mean values of *studying Internet knowledge* and *asking for advice* are higher than the total mean value (3.48). Among them, *asking for advice* (mean value=3.56) rank the first, which implies students are willing to ask for advice to learn in online environment. *Setting schedules* (mean value=3.38) ranking the last among the five items, which indicates that in vocational schools, most students are not good at making learning plans. Meanwhile, most of the participants think it is not a favorable choice for them to help their classmates.

*Sense of environment* refers to how the person feels about the network learning environment and how they think about their ability to use it effectively and seek for help when they need it.

**Table 4.** Four dimensions regarding sense of environment

Dimension	N	Min	Max	Mean	SD
Sense of environment -ease of e-learning	71	1	5	3.73	.96
Sense of environment-problem solving	71	1	5	3.63	.96
Sense of environment-Internet knowledge	71	1	5	3.58	.95
Sense of environment-Internet environment familiarity	71	1	5	3.65	.93
Sense of environment- e-learning knowledge confidence	71	1	5	3.46	.97
overall sense of environment	71	1.0	5.0	3.61	.79

As is shown in the table, *ease of e-learning* comes out on top (mean value=3.73), whereas e-learning knowledge confidence comes in last (mean value=3.46). This demonstrates that while the majority of participants believe that online learning is not very challenging, they lack sufficient confidence in their own network knowledge. The average results for the remaining categories (problem solving, Internet knowledge, and Internet environment familiarity) are comparable to the situational awareness composite average.

*Sense of control* refers to an individual's perception of their ability to control Internet learning activities and learning behavior.

**Table 5.** Four dimensions regarding sense of control

Dimension	N	Min	Max	Mean	SD
Sense of control -coping problems	71	1	5	3.28	.97
Sense of control- being undisturbed	71	1	5	3.25	.97
Sense of control-searching quickly	71	1	5	3.68	.91
Sense of control-protecting computers	71	1	5	3.62	.96
Sense of control- sharing material	71	1	5	3.48	.10
overall sense of control	71	1	5	3.46	.81

*Searching quickly* (mean value=3.68) was the highest of the five behavioral sense items, with both *being undisturbed* (mean value=3.25) and *coping problems* (mean value=3.28) significantly lower than the average (mean value=3.46). This means that the majority of participants believe they can rapidly find the information they require, but due to their lack of self-control and professional level, they are easily disturbed by the outside world and struggle to solve the problems they encounter.

#### 4.3. The inferential statistics of the Effects of Gender on internet self-efficacy

In order to examine whether gender plays a role in learners' internet self-efficacy, independent sample T-test was done to explore the relationship between the gender and internet self-efficacy. The statistics of the T-test are presented as follows:

**Table 6.** T-test of Internet efficacy of Gender

	Gender	No	Mean	SD	T	Sig.	95% confidence interval	
							lower	upper
Sense of ability	Male	42	3.48	.94	-.41	.69	-.49	.32
	Female	29	3.56	.66	-.44			
Sense of effort	Male	42	3.47	.91	-.15	.88	-.42	.36
	Female	29	3.50	.65	-.16			
Sense of environment	Male	42	3.59	.88	-.27	.79	-.43	.33
	Female	29	3.64	.65	-.28			
Sense of control	Male	42	3.50	.91	.47	.64	-.30	.48
	Female	29	3.41	.64	.51			
Overall self-efficacy	Male	42	3.51	.90	-.09	.93	-.40	.36
	Female	29	3.53	.61	-.10			

As is seen in the table, the mean value of the male is approximately the same with that of the female in all the four dimensions. The inferential statistics also indicates that there is no significant difference with regard to internet self-efficacy between the male and the female, including *sense of ability*, *sense of effort*, *sense of environment* and *sense of control*, with the sig (2-tailed) all higher than 0.05. In summary, gender exerts no significant influence on learners' internet self-efficacy.

**Table 7.** Analysis of Variance of Internet efficacy of Grade

	Grade	No	Mean	SD	F	Sig.	95% confidence interval	
							lower	upper
Sense of ability	1	27	3.78	.72	2.55	.09	3.50	4.06
	2	29	3.40	.88			3.07	3.73
	3	15	3.24	.86			2.77	3.71
	Overall	71	3.51	.83			3.31	3.71
Sense of effort	1	27	3.72	.70	2.62	.08	3.44	3.99
	2	29	3.43	.86			3.10	3.76
	3	15	3.15	.82			2.70	3.60
	Overall	71	3.48	.81			3.29	3.67
Sense of environment	1	27	3.84	.67	2.00	.14	3.58	4.11
	2	29	3.49	.83			3.18	3.80
	3	15	3.43	.86			2.95	3.90
	Overall	71	3.61	.79			3.43	3.80
Sense of control	1	27	3.76	.72	3.58	.03	3.47	4.04
	2	29	3.37	.81			3.06	3.68
	3	15	3.12	.82			2.67	3.57
	Overall	71	3.46	.81			3.27	3.65
Overall self-efficacy	1	27	3.77	.68	2.77	.07	3.51	4.04
	2	29	3.42	.82			3.11	3.73
	3	15	3.23	.81			2.79	3.68
	Overall	71	3.52	.79			3.33	3.70

It is shown in the table that the mean value of *grade 3* is lower than that of *grade 1 and 2* in all the four dimensions. There are distinctions among grades in terms of *sense of control* (sig = 0.033). There is no significant difference with regard to internet self-efficacy between the *grade 1, 2 and 3*, including *sense of ability, sense of effort, sense of environment*, with the sig (2-tailed) all higher than 0.05.

#### 4.4. Descriptive statistics of educational technology

**Table 8.** Five dimensions regarding educational technology

Dimension	N	Min	Max	Mean	SD
Source of teaching material	71	1.00	5.00	3.14	.77
Type of e-learning tool	71	1.00	5.00	3.42	.90
Implementation of digital resources	71	1.00	5.00	3.46	.87
PPT technology	71	1.00	5.00	3.49	.84
Learning effect	71	1.00	5.00	3.49	.92
overall sense of educational technology	71	1.00	5.00	3.40	.75

As shown in the table, the mean values of type of *e-learning tool, implementation of digital resources, PPT technology, learning effect* are higher than the total mean value (3.40). Among them, *PPT technology* (mean value=3.49) ranks the first, which indicates the participants are satisfied with teachers' application of PPT. However, *source of teaching material* ranks the last among the five items with the mean of 3.14, which is much lower than the mean value 3.40. It can be concluded that most of the participants think it is essential to improve the source of teaching material in various ways.

#### 4.5. Correlation between internet self-efficacy and educational technology exposure

In order to answer the research question in the present study, Pearson correlation analysis is conducted to explore the relationship between the internet self-efficacy and educational technology exposure.

**Table 9.** Inferential statistics regarding the effect of educational technology on internet self-efficacy

		internet self-efficacy	educational technology exposure
internet self-efficacy	Pearson correlation	1	.686**
	Sig.		.000
educational technology exposure	Pearson correlation	.686**	1
	Sig.	.000	

It can be seen from the table that the Pearson correlation coefficient between the internet self-efficacy and educational technology exposure is *significant at 0.01 level, with the value .686*. The results suggest the internet self-efficacy and Educational technology exposure have significantly positive correlations.

#### 4.6. Correlation between internet self-efficacy and five dimensions of educational technology exposure

**Table 10.** Correlation between internet self-efficacy and five dimensions of educational technology exposure

		source of teaching material	type of e-learning tool	implementation of digital resources	PPT technology	learning effect
internet self-efficacy	Pearson correlation	.472**	.604**	.652**	.610**	.630**
	Sig.	.000	.000	.000	.000	.000

The table shows a significant Pearson correlation between internet self-efficacy and the five variables of exposure to educational technology at the 0.01 level, with values of .472, .604, .652, .610, and .630. As a result, it is confirmed that the five variables of exposure to educational technology and internet self-efficacy have remarkably positive connections.

#### 4.7. Regression analysis

As is indicated above, internet self-efficacy is positively correlated with educational technology exposure. For the purpose of further examining to what extent the educational technology exposure impacts internet self-efficacy, linear regression analysis is performed.

**Table 11.** Model Summary

Model	R	R Square	Adjusted R Square	Std Error of the Estimate
1	.686a	.471	.463	.576

a. predictor: overall educational technology evaluation

As is shown in Table 11, the R square is 0.471, which means educational technology exposure explains 47.1% of the internet self-efficacy. Thereby, educational technology exposure is one contributing factor of the internet self-efficacy.

## 5. Discussion

Four research questions were addressed in this study in order to substantially add to the understanding of how educational technology can impact learners' internet self-efficacy. The first question concerned the extent of learners' internet self-efficacy in vocational institutes in China. Overall, the results showed that the internet self-efficacy of the students of vocational institutes in China is above

the intermediate level. However, it demonstrates that although students in vocational schools are more self-assured when learning online, their initiative needs to be improved. The second question involves whether the potential variables, including gender, grade, and discipline, impact learners' internet self-efficacy in vocational institutes in China. The results indicate that there is no significant difference concerning internet self-efficacy between the male and the female, which is in conflict with the findings in the previous studies (Bimer, 2000; Isman & Celikli; 2009) and is in line with previous research (Sam, Othman & Nordin, 2005; Wang, 2018). There might be some explanations for the findings: with the advancement of science and technology, educational technology is becoming increasingly popular, both male and female students are becoming more familiar with using the Internet. In the field of education in China, the social support system supports both male and female students equally. As for the hypothesis of the correlation between educational technology exposure and learners' internet self-efficacy, it is shown from our results that exposure to educational technology positively related to learners' internet self-efficacy. The response to the extent of learners' evaluation of the implementation of educational technology in vocational institutes in China addressed in the fourth question shows that the use of educational technology contributed to some extent to students' internet self-efficacy.

Given that these findings are promising, further studies concerning learners' self-efficacy are needed in the field of educational technology. For instance, for a deeper understanding of the impact on internet self-efficacy, methods and effect of educational technology should be explored.

## 6. Conclusion

The purpose of the study was to explore how educational technology impacts students' internet self-efficacy. In line with similar prior studies, our findings suggest that the exposure of educational technology and learners' self-efficacy is positively related to learners' internet self-efficacy. In a summary, the internet self-efficacy of Chinese vocational institute students is higher than the intermediate level. Students express confidence in sense of environment and a lack of confidence in their sense of ability, sense of effort, and sense of behavior. Meanwhile, most of the students are satisfied with teachers' application of PPT, but they believe it is critical to improve the source of teaching material in a variety of ways. In addition, there was no significant difference of internet self-efficacy between male and female students. However, some of the limitations of the study could be considered. For instance, the sample size and diversity could be enhanced in future research, which may provide a more comprehensive understanding of the field of educational technology and internet self-efficacy. Furthermore, new variables (e.g., age, residence, major) should be taken into account when examining the effect on internet self-efficacy. Online data collecting was used in this study therefore it was challenging to cover all categories of student.

To sum up, this study is to analyze how educational technology can be employed to stimulate learners' internet self-efficacy. Whether we can use task-based instruction with educational technology and allow students to work independently in small groups to experiment with the resources is needed to be studied in the future. It is of significance to explore how some other factors of educational technology affect students' internet self-efficacy.

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