CAMBODIAN TEACHERS' READINESS OF USING ICT: THE CASE OF RURAL UPPER-SECONDARY SCHOOLS

Sina Pang[1], Ravy Nhor[2], Sereyrath Em[3]

[1,2]School of Foreign Languages, The University of Cambodia, Phnom Penh, Cambodia,
[3]National University of Cheasim Kamchaymear, Kompong Cham Campus, Cambodia
Email: pang.sina.hs@moeys.gov.kh[1*], ravynhor@hotmail.com[2],
sereyrathem.edu@gmail.com[3]

Abstract: Many people in the twenty-first century are familiar with technology. The Education Ministry of the Kingdom of Cambodia has also included ICT subjects in the school curriculum. However, due to the lack of preparation, many Cambodian teachers, especially those living in the countryside, face many challenges with ICT applications and seem unprepared to use ICT in their teaching. The current study employed a quantitative method through survey techniques. It aimed to examine Cambodian teachers' perceptions of ICT use in the classroom, the level of training on ICT, and the challenges of technical support and ICT infrastructure in schools. 109 teachers (25 females) were asked to participate in the study. The results show that all the teachers had a positive attitude toward using ICT in teaching. Although most of them are confident in their ability to use ICT, less than half use it in their teaching. The result also shows that most teachers received training on using ICT, but they possessed only basic computer skills. Most of them reported that having poor access to computers and the internet was their main challenge. Future studies should be conducted using a qualitative or mixed-methods design with similar topics. The study regarding the challenges of implementing an ICT school curriculum provided by MoEYS is also recommended.

Keywords: Information and Communication Technology (ICT), Teachers' Readiness, ICT Application

Abstrak: Banyak orang di abad kedua puluh satu yang akrab dengan teknologi. Kementerian Pendidikan Kerajaan Kamboja juga telah memasukkan mata pelajaran TIK dalam kurikulum sekolah. Namun, karena kurangnya persiapan, banyak guru Kamboja, terutama yang tinggal di pedesaan, menghadapi banyak tantangan dengan aplikasi TIK dan tampaknya tidak siap untuk menggunakan TIK dalam pengajaran mereka. Penelitian ini menggunakan metode kuantitatif melalui teknik survei. Ini bertujuan untuk menguji persepsi guru Kamboja terhadap penggunaan TIK di kelas; tingkat pelatihan TIK; dan tantangan dukungan teknis dan infrastruktur TIK di sekolah. 109 guru (25 perempuan) diminta untuk berpartisipasi dalam penelitian ini. Hasil penelitian menunjukkan bahwa semua guru memiliki sikap positif terhadap penggunaan TIK dalam mengajar. Meskipun sebagian besar dari mereka percaya diri dengan kemampuan mereka untuk menggunakan TIK, kurang dari setengah dari mereka menggunakan TIK dalam pengajaran mereka. Hasilnya juga menunjukkan bahwa sebagian besar guru menerima pelatihan tentang cara menggunakan TIK, tetapi mereka hanya memiliki keterampilan komputer dasar. Sebagian besar dari mereka melaporkan bahwa memiliki akses yang buruk ke komputer dan internet adalah tantangan utama mereka. Studi masa depan harus dilakukan dengan menggunakan desain kualitatif atau metode campuran dengan topik serupa. Kajian mengenai tantangan penerapan kurikulum sekolah TIK yang disediakan oleh MoEYS juga direkomendasikan.

Kata Kunci: Teknologi Informasi dan Komunikasi (TIK), Kesiapan Guru, Aplikasi TIK

INTRODUCTION

Technology advancement, especially the current development of the internet, computers, and smartphones, has led to the new development of various language teaching methods and approaches (Law et al., 2008). These approaches and methods blend real classroom activities with synchronized videos and other ICT tools, which positively impact learning and teaching. ICT has changed the roles of teachers and learners and improved the quality of their teaching and learning (Jager & Lokman, 2000). With personal computers or smartphones, teachers and students can share, manage, and discuss their class activities anywhere and anytime (Shin et al., 2011). These technologies effectively enable teachers to manage their classes, teaching materials, and student relations. Likewise, teachers can access various teaching tools and resources that assist them in developing materials, administering their tests, and monitoring their students' progress efficiently and effectively (Lim et al., 2005). Besides, these technologies have provided students with more options for exposing themselves to learning resources through the use of social networking sites (Tess, 2013).

As in the Cambodian context, much effort has been put into developing various ICT resources in its education system. Unfortunately, most teachers teaching in rural secondary schools find adopting these technologies in their classrooms challenging (Richardson, 2011). Teacher-centered approaches are still commonly practiced by most Cambodian government teachers (Tan, 2007). The grammar-translation method is still seen to be popular (see Houn & Em, 2022). Traditional classroom activities such as physical materials, face-to-face communication, and printed tests are still the sole basis of core learning and teaching activities. In some rural secondary schools, smartphones are forbidden in the classrooms.

In the context of Cambodian secondary schools, the main challenges of ICT adoption are insufficient training for the teachers, poor access to electricity and internet connection, the lack of computers, and unawareness of the benefits of technology, according to Em (2021), Em et al. (2022), and Richardson (2011). As a result, the application of traditional teaching approaches, the use of traditional classroom management styles, insufficient ICT infrastructure, and teacher training are still the main issues that have not been completely addressed in rural secondary schools in Cambodia.

Notably, ICT was formally included in the Cambodian school curriculum in 2015. At the primary level, among the other subjects, computers, being the basic need to start ICT, is a subject included in the curriculum from Grade 4 to Grade 6. From Grade 7 to Grade 12, the computer subject is changed to ICT. After completing all the requirements, students are expected to have good knowledge, skills, and attitude accordingly (see MoEYS, 2015). Table 1 presents information about computer and ICT subjects in the Cambodian curriculum according to grades and the number of hours for each grade.

Table 1. Information about computer and ICT subjects in the Cambodian curriculum

No.	Subjects	Grades								
		4	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1.	Computer	1[*]	1[*]	1[*]	0	0	0	0	0	0
2.	ICT	0	0	0	2[**]	2[**]	2[**]	3[***]	3[***]	3[***]

* Students are required to study computer skills for 1 hour a week.
**Students are required to study ICT for 2 hours a week.
***Students are required to study ICT for 3 hours a week.

Insufficient training and inappropriate classroom technology use cause barriers to students' engagement and learning outcomes. The challenges of ICT integration in the classrooms, such as the lack of training, negative perception, resources, and time, are the major problems for teachers and students in terms of increasing student achievement. By knowing their problems and understanding their perceptions, secondary school teachers will be assisted in applying these skills properly and efficiently in their classrooms. Therefore, this study aimed to investigate the readiness of ICT use in the classrooms among teachers in secondary schools in Cambodia by investigating their perceptions of ICT use in the classrooms, their level of training on ICT, and the challenges of technical support and infrastructure of ICT in their schools. This study has three objectives: to examine the teachers' attitudes toward using ICT, to examine if teachers have adequate training and qualifications to use ICT, and to identify the technical barriers hindering the use of ICT in their classrooms.

Understanding teachers' problems, their levels of training on ICT, and their attitudes that affect their readiness to use ICT are important as this knowledge can provide the entire English language education process with information regarding their readiness to use ICT. This information can, in turn, be used to design ways to integrate ICT into English language teaching in rural secondary schools in Cambodia. In addition, the study findings can help education policymakers identify challenges in ICT integration among teachers, especially those working at secondary schools in rural Cambodia, provide the right solutions, and develop a policy framework that can lead to the total adoption and embracing of ICT amongst teachers at the secondary school level. Most importantly, the information from the study helps the schools deal with teachers' issues when working on integrating ICT into teaching at the secondary school level. Finally, the information will help teachers identify their strengths and weaknesses in the area of ICT integration into their classrooms.

LITERATURE REVIEW
Policy Framework

To align with the regional goal and improve its education development and quality, Cambodia has introduced various initiatives, plans, and strategies that aim to boost the development of ICT across the country. To improve the quality of secondary education and the adaption of technologies in secondary education, the Ministry of Education, Youth, and Sport (MoEYS) have taken numerous strategic actions. These include upgrading the national curriculum, improving teachers' qualifications and school facilities, encouraging secondary schools to use ICT in their operations, seeking funds to support internet access at rural schools, restructuring its teacher training centers, and establishing a New Generation Schools (MoEYS, 2019).

In March 2018, the Cambodian government announced its plan to be ready to transform into a digital economy by 2023 (Heng, 2019). In January 2005, MoEYS released its first version of policy and strategies on ICT in education. The second version of the same document was released on May 07, 2018. Besides these policies, MoYES also released many versions of master plans for ICT. The first version, which is from 2009 to 2013, was released on December 31, 2010, and the second version, the Master Plan for ICT in 2020, is called "ICTopia Cambodia". This plan was made following the release of the ASEAN Master Plan 2020 in 2015 and as an attempt to align with the vision and mission of the Connect Asia-Pacific Summit (KOICA, 2014).

In addition to the development of these policies, strategies, and plans, it was also observed that the government has also garnered resources from all sectors to help boost the development of ICT. In 2016, MoYES, in collaboration with local NGOs, established a New Generation School, which is part of the government's intention to restructure its secondary education system profoundly. One of these schools' key strategies is to use technology as a key element in its system, including student usage of new educational software that will enhance teaching, learning, and assessment (MoEYS, 2016).

However, there has been criticism that all these plans, policies, and strategies have not effectively reduced the technology gaps between secondary education in rural and urban areas. One of the reasons hindering this is the government's failure to plan the implementation process thoroughly (Richardson, 2008). Tinio (2003) analyzed ICT in education reform in some countries, including Thailand, Mexico, India, Indonesia, China, Japan, and South Korea. Tinio found that the nations that have successfully implemented ICT in education policy thoroughly assessed their current education system to determine goals, needs, and implications.

Challenge of ICT Application in Education

Richardson (2011) found in his study on the challenges of adapting ICT in developing countries: a case study in Cambodia, that language skills, poor internet access, the lack of ICT and computer skills, computer maintenance capacities, and internet services were the main challenges that teacher trainers had been confronting. This finding leads to the assumption that most secondary school teachers also face similar challenges, especially those working in rural secondary schools in Cambodia.

Khan et al. (2012) also mentioned many similar barriers that prevent using ICT in the classroom in Bangladesh. These include limited access to computers, insufficient technical support, and teachers' illiteracy of computer skills. In addition, the challenges can also be classified into poor equipment, limited skills, and a lack of interest by the teachers. Richardson (2008) also noted the importance of technical and infrastructure support as the main factors that ensure long-term ICT development in the system.

According to Salehi and Salehi (2012), insufficient technical support, poor access to the Internet and ICT, and the nature of existing classroom time and schedules are the main challenges hindering the adaption of ICT in the classroom. Carnoy (2004) argued that although teachers have good access to the internet and ICT, they may not be willing to apply it in the classroom if they do not have enough training.

Factors Hindering Teachers to Use ICT in the Classroom

Galanouli et al. (2004) noted that the training provided to the teachers might enable them to use ICT in their classrooms. However, their reaction to the content and skills provided will determine whether they are willing to use the skills or not. It has a connection to their attitude to using ICT. The teachers are the principal actors or stakeholders in the learning process (Nunan & Lamb, 1996). Teachers' attitudes toward ICT are key factors determining successful integration (Law, 2008; Teo et al., 2009). Their perception of ICT influences their support, willingness, and determination to apply ICT using their skills and knowledge (Chai et al., 2009). The teacher's negative attitude toward using ICT may impact the whole integration process of integrating ICT in teaching and learning.

Knowledge and skills are important for teachers to use ICT in the classrooms (Chuan & Ho, 2011). However, if they are unwilling to apply this knowledge and skills in their classes, the school support, knowledge, and facilities will become useless. Thus, teachers' perception of the use of ICT is important; it strongly affects their motivation to use it. With their strong support, the schools and relevant stakeholders can implement an ICT program successfully.

Teacher competence refers primarily to the ability to integrate ICT into pedagogical practice. The lack of knowledge is regarded as a significant teacher-related barrier to ICT integration (Angeli & Valanides, 2009). A teacher's lack of knowledge is a considerable challenge to using computers in teaching methods and practices (Williams et al., 2000). In addition, if teachers have a high level of ICT knowledge, there will be a higher level of ICT use in classrooms. According to some researchers, these barriers vary from country to country (Sife, 2007). The lack of technological knowledge among teachers in developing nations is the primary obstacle to the uptake of ICT in education.

Successful integration of the use of ICT in education requires high-quality, frequent training and professional development (Jung, 2005). If this training is not provided, then all the effort put into integrating will be useless. The training of teachers in integrating ICT into the learning and teaching process is cost-effective. It is so because it involves several complex factors to ensure effective training. These include finding the time for training, training in pedagogy, skills training, and the use of ICT in the teacher's initial training.

The environment in various institutions or schools can also be a factor that will prevent the integration of ICT into the learning and teaching process (Tondeur et al., 2008). These conditions can be varied depending on where the school is located and the type of class or school. Some of these include technical problems and the shortage of computers in a laboratory; a lack of detailed plans on how ICT can be used to enhance teaching and learning; timetable difficulties; and the willingness of school authorities to provide the needed funds when need arises.

RESEARCH METHODOLOGY

Research Design

This research was designed using a cross-sectional study that aimed to determine teacher readiness to use ICT in the classroom in secondary schools in Cambodia. It was a conceptual framework within which research was conducted. This study adopted a quantitative approach, in which quantitative research generates numerical data through survey studies and questionnaires. This type of research involves many people. However, contact with participants is much quicker than in qualitative research.

Population and Sampling

The target population for this study was the teachers in upper-secondary schools in Takeo province, Cambodia. The eligible teachers for the study were those currently teaching in upper secondary schools in Cambodia. It also includes on-contract teachers who are currently active in their service at the upper secondary level. The total number of samples for the study was 109 upper secondary school teachers. The total sample consists of only 25 female teachers. Convenient sampling was used as the main technique for selecting the participants.

Participants' Information

Table 2. Demographic information of participants

Demographics	Values	N	Percentage
Genders	Male	84	77.00
	Female	25	23.00
Ages	18-25	7	6.00
	26-30	41	38.00
	31-36	49	45.00
	37-40	11	10.00
	46-50	1	1.00
Education	Bachelor's degree	22	20.00
	Master's degree	67	62.00
	PhD	20	18.00
Length of Teaching Experience	Less than 1 year	9	8.00
	2-5 years	55	51.00
	6-10 years	33	30.00
	11-15 years	7	6.00
	16-20 years	4	34.00
	Over 20 years	1	1.00
Subjects	English	47	43.00
	Non-English	62	57.00

Research Instrument

The research instrument was a closed-ended questionnaire, which offered the advantages of being easy and cost-effective to administer to a large population. The questionnaire consisted of four sections and 29 questions. The questionnaire for data collection was designed based on the literature review. The questionnaire was partly

adapted from Barde (2017). It has four sections covering the following areas: demographic information; the teacher's attitude toward using ICT; the extent to which prior computer training influences teachers' readiness to use ICT; and the extent to which ICT infrastructure and other technical support influence teachers' readiness to use ICT.

Data Collection Procedure

The questionnaire was designed using Google Forms and was administered via email, social media, in person, or by telephone. Using a convenient sampling technique, we contacted the teachers individually. The respondents were given relevant instructions and assured of confidentiality before being given or sent the questionnaires. The researchers also collected the hard-copy questionnaires, and the online ones were automatically stored on Google drive.

Data Analysis

The purpose of data analysis is to find meaning in the collected data. Descriptive statistics, including frequency distribution and percentages, were computed and analyzed with the aid of the computer software Statistical Package for Social Sciences (SPSS). The mean (M) and standard deviation (SD) of teachers' computer skills were also analyzed. Quantitative data results from the report were then presented in the following.

FINDINGS AND DISCUSSION

Teacher Attitudes towards ICT Use in the Classroom

Table 3. Teacher perception of using ICT

Variables	Values	N	Percentage
Teacher's perception of using ICT in teaching	Very Good	53	49.00
	Good	56	51.00
Their experience of Using ICT	Yes	63	58.00
	No	46	42.00
The change in their belief	Yes	36	33.00
	No	73	67.00

As shown in Table 3, all teachers reported that they had a positive attitude toward the use of ICT in teaching. Out of 109 participants, 56 participants, accounting for 51%, agreed that ICT was good. 53 participants, representing 49% of the total participants, thought that ICT was very good for their teaching. Although all participants positively believed in the usefulness of ICT in their teaching, almost 50% of these teachers had never used ICT in their teaching. 46 participants, representing 42% of the respondents, reported never using ICT in their teaching. Most respondents who have never used ICT in their teaching reported that they had considered using ICT in their teaching. Most teachers, accounting for 67%, change their beliefs toward applying ICT in their classes. Overall, all the teachers perceived ICT use positively. Even though some have never used ICT in teaching, they are probably willing to do so in the future.

Teachers' Confidence

Table 4. Teachers' confident in using ICT

Variables	Response	N	Percentage
Teachers' Confidence in Using ICT	Very confident	19	17.00
	Confident	60	55.00
	Fairly confident	28	26.00
	Least confident	2	2.00
	Total	109	100

Table 4 illustrates the level of confidence of secondary school teachers in using ICT in their classrooms. Overall, the majority of teachers were confident in their ability to use ICT in their teaching. More than 50% of the teachers believed they were confident in using ICT in their teaching, with 55% being confident and 17.4% being very confident. Of all the teachers, 28 were fairly confident in their ICT ability, representing about 25.7%. Only 2 of all respondents, accounting for 2%, reported that they were not so confident in using TCT. This finding shows that most teachers are confident in their ability to use ICT.

Table 5. Gender and teachers' confidence in using ICT

Variables		Response	Very Confident	Confident	Fairly confident	Least confident	Total
Gender	M	Count	16	45	21	2	84
		% Within Gender	19%	54%	25%	2%	100%
		% Of Total	15%	42%	19%	2%	77%
	F	Count	3	15	7	0	25
		% Within Gender	12%	60%	28%	0%	100%
		% Of Total	3%	14%	6%	0%	23%

As shown in Table 5, female teachers indicated that they are more confident in using ICT in their classrooms. They accounted for 60% and 28% of the confident and fairly confident, respectively. In addition, the table shows that the male teachers were perceived to be less confident than their counterparts, and they were rated as confident by 54% and fairly confident by 25%. Furthermore, the table displays that 2% of the male teachers are reported to be less confident in using ICT while none of the female respondents are. Finally, the table illustrates that male teachers who are very confident (19%) are higher than females (12%). This result means that female teachers are more confident than male teachers.

Teachers' Experience and Confidence

Figure 1. Length of teaching experience and level of confidence in using ICT
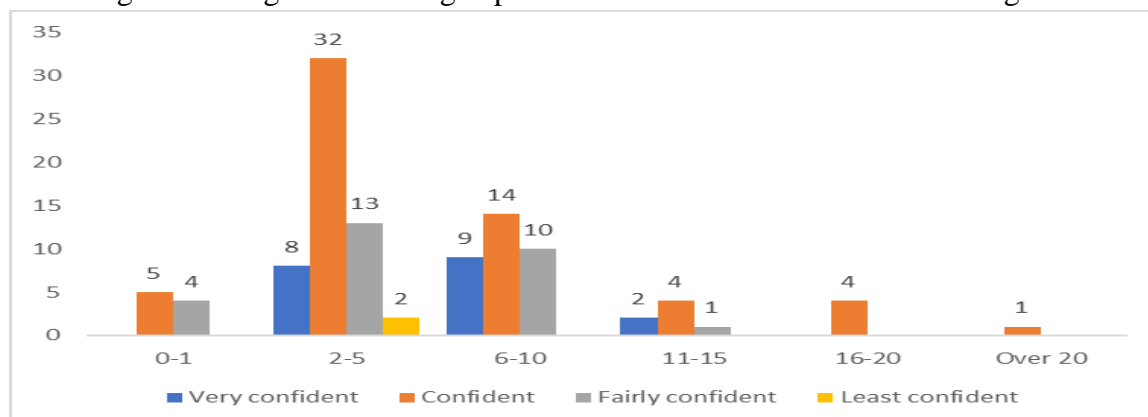

Figure 1 illustrates the level of confidence the teachers have based on the length of their teaching experience. The figure indicates that the teachers whose experience is 2-5 years have the highest level of confidence; 55% for confident; 26% for fairly confident; 17% for very confident; and 2% for least confident. It is followed by those with teaching experience of 6-10 years (30%), with 43% saying they are confident, 30% saying they are fairly confident, and 27% saying they are very confident. The confidence level seems lower among the respondents with 11-15 years (6%) and 16-20 years of experience (4%), and the lowest is for the teachers with more than 20 years of teaching experience, accounting for 1%. The figure also illustrates that the novice teachers with experience of 0-1 year also showed that their confidence level is low, as they perceived themselves as confident and fairly confident, representing only 8% of all respondents. This result means that the level of confidence in using ICT is very high for teachers who have been teaching between 2-5 years and 6-10 years; however, this confidence level seems very low for inexperienced teachers (0-1 year) and teachers with a lot of experience (from 11 years up).

The Training That Prepares Teachers to Use ICT in the Classroom

Table 6. Teacher's perception of ICT training

Variables	Responses	N	Percentage
	Yes	82	75.00
Training on ICT	No	27	25.00
	Total	109	100
	Yes	82	77.00
The usefulness of the training	Not Applicable	25	23.00
	Total	109	100
	Yes	102	94.00
Effect of training on teacher motivation	No	7	6.00
	Total	109	100

According to table 6 above, 82 teachers, accounting for 75%, reported that they were trained when they were in teacher training college. In comparison, only 27 teachers, about 25%, reported never receiving any ICT training. It means most of our teachers

received ICT training. The same table also shows that the majority of the teachers, which was about 77%, said the training they received was useful for their teaching. In contrast, 25 teachers, representing 23%, reported that their training was useless.

Almost all teachers reported that the training on ICT would motivate them to apply ICT in their classes. 102 teachers, representing about 94%, believed that with training, the teacher would use ICT in the class, while only seven teachers, representing 6%, said the training would not encourage them to use ICT. The finding shows that most teachers will use ICT in their classes if they have enough high-quality training.

Computer Skills

Table 7. Levels of computer skills

Variable	Responses	N	Percentage
Computer Skills	I cannot use a computer at all	4	4.00
	I can operate basic computer functions	19	17.00
	I can use Word, Excel, and PowerPoint for the school assignment	21	19.00
	I can use Word, Excel, PowerPoint, and the Internet	59	54.00
	I can use Word, Excel, PowerPoint, Internet, and have advanced computer skills	6	6.00
	Total	109	100

The finding reveals that most teachers possess basic computer skills. According to Table 7, as many as 105 (56%) teachers knew the basic functions of computers. There are 19 (17%) teachers who knew only the basic function of computers and 21 (19%) teachers who could use Office Applications. 59 (54%) teachers can use Office Applications and the Internet, and 6 (6%) teachers have advanced computer skills such as development and graphic design. There are only 4 teachers who cannot use a computer.

The ICT Facilities

Table 8. Teachers' access to a computer

Variables	Responses	N	Percentage
Access to computer	Yes	97	89.00
	No	12	11.00
Use of computer	Daily/almost daily	61	56.00
	Once a week	24	22.00
	Once a month	16	15.00
	Never	8	7.00
Computer in office	Yes	93	86.00
	No	16	15.00
Number of computers in the office	Less than 5	69	63.00
	6-10	18	17.00
	11-15	10	9.00
	16-20	2	2.00
	More than 21	10	9.00

According to the data shown in Table 8, as many as 97 teachers, representing 89% of the total teachers, could use a computer, while 12 teachers, representing 11%, have no access to a computer. However, only about half of them (56%) used computers every day. Of the 24 teachers, representing 22% use a computer once a week. 50% of teachers used computers at least once a month, and 8 (7%) of them reported having never used a computer.

Almost all teachers also reported that their school offices had computers. Although most of their schools have computers, this number is not enough. However, more than 63% of them reported that their office had fewer than five computers. 28 teachers, marking up 26% of the total participants, said their office had computers between 6 and 15, and only about 12 teachers' school offices have more than 20 computers.

Teachers' Access to the Internet

Table 9. Teachers' access to the internet and their preferred mode of learning

Variables	Responses	N	Percentage
Access to the internet	Yes	108	99.00
	No	1	1.00
Source of access to the internet	Smartphones	86	79.00
	Workplace	12	11.00
	Mini Mart/Coffee Shop	6	6.00
	College/University	2	2.00
	Other	3	3.00
Mode of Learning	Physical activities	59	54.00
	Online lectures/tutorials	40	37.00
	CD, DVD, and other multimedia	5	5.00
	Other	4	4.00

According to table 9 above, 108 (99%) teachers reported having internet access. Only one of them said he/she did not use the internet. The table also shows that smartphones were the most common source of internet access. As many as 86 teachers reported that they used the internet using smartphones. The second common source of internet access was their workplace. 12 teachers, accounting for about 11%, said their school also provided internet service. Besides these two sources, a few of them reported that they could access Mini Mart/Coffee Shop, college/university, and other sources, representing 11%. This finding shows the main source of their internet access is their smartphones.

As shown in the same table, physical activities are still teachers' most popular learning mode. 59 teachers, representing about 54% of the total, preferred traditional learning activities in the classroom setting. Online lectures and tutorials are the second most popular method of learning. 40 teachers, who are about 37%, like online activities and materials, such as lectures and tutorials. Only five teachers still used CDs, DVDs, and other multimedia, and four teachers did not mention their favorite learning method. This result shows that traditional classroom activities are popular among these teachers.

Other Factors Affecting Teachers' Use of ICT

Table 10. Teachers' computer skills

No.	Computer Skills	Mean	SD
1	Ability to use a computer	3.69	.32
2	Access to the internet	3.63	.30
3	Personal computer	3.62	.25
4	Cost of buying a personal computer	2.94	.21
5	Overall	3.47	.27

Note: Mean score of 1.00-1.80 = Lowest, 1.81-2.60 = Low, 2.61-3.40 = Moderate, 3.41-4.20 = High, and 4.21-5.00 = Highest

According to table 10, teachers reported moderate perceptions of items 1, 2, and 3. Teachers reported low perception in item 4. Overall, teachers reported moderate perceptions regarding the factors affecting the use of ICT (M = 3.47, SD = .27). The results mean that only about half of the participants were able to use a computer, access the internet, and have a personal computer. Notably, more than half of the participants could not afford to buy a personal computer, as reported in item 4. Overall, the factors sum up to M = 3.47, SD =.27.

The Main ICT Facility Challenge

Table 11. Main ICT facilities challenges

Responses	N	Percentage
No/not enough computers	39	36.00
No/poor internet connectivity	58	53.00
No electricity/frequent electricity failure	4	4.00
Other	8	7.00
Total	109	100

The finding shows that limited access to computers and the internet is still teachers' main challenge in rural areas. As shown in Table 11 above, 58 (53%) reported that no/poor internet connectivity was the main problem they faced. As many as 39 teachers, or about 36%, said they did not have enough computers. Only 4% of teachers still had a problem with electricity, and about 8 reported having problems unrelated to these categories.

DISCUSSION

The current study employed a quantitative method through survey techniques. It aimed to examine Cambodian teachers' perceptions of ICT use in the classroom, the level of training on ICT, and the challenges of technical support and ICT infrastructure in schools. According to the survey, all the teachers have a positive attitude toward using ICT in teaching. Although most of them are confident in their ability to use ICT, less than half of them use ICT in their teachings. The result also shows that most teachers received training on using ICT, but they possess only basic computer skills. The majority of them agreed that their main challenges are a lack of computers and internet access.

Teacher's Attitude toward the Use of ICT in Teaching

As teachers are one of the main factors that hinder the integration of ICT in education, having a good understanding of their attitude is very important to assess their readiness to use ICT (Drent & Meelissen, 2008). Some studies have shown that teachers are the principal stakeholders in the learning process (Law et al., 2008). It means that teacher-related issues are very important to determining ICT use in the classroom. It is argued that teachers' attitudes toward ICT are another key indicator that ensures the successful integration of ICT into the classroom. From the above, it is clear that the teacher is one key determinant factor among the other factors in the integration of ICT. It, therefore, implies that the barriers to ICT integration can hurt the whole integration process.

The present study found that upper-secondary school teachers who participated in this research study had a positive attitude toward using ICT in education. Teachers unanimously agreed that ICT was good for their teaching. However, the current study's findings confirmed that although these teachers had a positive attitude toward the use of ICT and knew the importance of ICT, almost 50% of them still did not use ICT. This finding implies that teachers' attitudes may not be the main challenges that hinder the utilization of ICT in the classroom. If this is true, if the school introduces ICT, they will support and cooperate. With training and facilities, these teachers will be willing to apply ICT. From this, we can conclude that these teachers are ready to use ICT in terms of their attitude toward the application of ICT.

Teachers' Level of Training and Qualification in ICT

The result of this study showed that most teachers had received ICT training while in teacher training colleges. All of them reported that the training was very useful and motivated them to use ICT. However, almost half of all the teachers did not use ICT in their teachings. More than half of the teachers had basic computer skills. Almost all of them can access computers, but not many use them for teaching-learning and administrative purposes. Only a small number of them use computers every day. They can use only the basic functions of computers and Microsoft applications for simple tasks.

From this result, we can see that although teachers have a good attitude toward the use of ICT, they may not apply it if they do not have enough training on ICT. The training they received at teacher training colleges might not be enough or relevant to their real classroom needs. It is also observed that most of these teachers lack the knowledge and competence to use ICT to facilitate the teaching-learning process. Most of them know only basic computer functions. They can use the computer only for simple typing tasks for their assignments. According to current technology, ICT becomes useful for teaching and learning only with the assistance of the internet and basic graphic design. Without skills in downloading, browsing, designing, and surfing the internet, teachers may not be able to successfully exploit the benefits of ICT technology in their teaching and learning. Currently, teachers can use Microsoft Word to type questions and other documents in schools, but they can use the computer to keep records only. They cannot use PowerPoint to present lessons. These teachers do not have internet skills, such as

browsing the internet to get materials for teaching, using software to download documents, using a computer to teach online materials, and using other online platforms to keep their students in touch and share the materials. Most of the teachers were in the process of learning how to use tools and applications that enable them to use ICT in their classrooms effectively.

It means that more responsibility could be left to individual teachers to decide how ICT might be integrated into the classroom so long as this is accompanied by more effective professional development processes and opportunities (Chuang & Ho, 2011). Without the necessary capacity building and training, there remains the ongoing risk of variation among students, classrooms, provinces, and even the country and an increased digital divide locally and more broadly.

Smeets & Mooij (2001) suggest that building teachers' digital competence in terms of knowledge and awareness of pedagogical platforms for integrating ICT could help teachers make effective professional choices in terms of planning ICT integration in the class. As mentioned above, some research suggests that the most successful integration of ICT in the classroom often emerges when teachers utilize tools or practices they feel most comfortable with. By being more aware of the range of approaches, methods, and platforms and the ICT that complements their teaching platform, teachers become more suitably digitally competent in integrating ICT. Successful ICT integration into education requires a broader understanding of what such a term encompasses (Sife, 2007). From the above, we can see that, at the very least, it requires an understanding of some key issues affecting guidelines and directives set out by the authorities regarding what constitutes sound policy (Tondeur et al., 2008).

The Challenges of ICT Infrastructure and Technical Support

The findings of the current study show that the facilities for ICT in rural schools in Cambodia are still inadequate. Generally, teachers have limited access to computers and the internet. The most common source of internet access is smartphones. Although some schools provide internet service inside the campus, the service is limited. Some teachers have computers but rarely use them for teaching and learning purposes. There are not enough computers that can be used for learning and teaching activities.

Yuen et al. (2003) found that teachers can act as catalysts for integrating technology via ICT. However, without the incentive, equipment, and technological support provided by the school's relevant stakeholders, the development and integration of ICT might be impossible. Fakeye (2010) confirmed that the unavailability of ICT facilities greatly slows the process of integrating ICT and affects teachers' motivation to apply ICT in their classrooms or develop their ICT skills since they think it will be useless to know without facilities. We can also assume that the current study reveals that most teachers lack the basic skills to use computers and other ICT devices. This result is similar to other researchers' findings in other developing countries. A research study on secondary schools in other countries has shown that most secondary schools have either insufficient or no ICT tools to cater to the ever-increasing population of teachers in schools where they are available (Adebi-Caesar, 2012).

Khan et al. (2012) conducted a study on the challenges of introducing ICT in education in developing countries: the example of Bangladesh. They found that the lack of resources within educational institutions is still the major hindrance to implementing ICT in the classroom. These resources include the lack of computers (both software and hardware) and other ICT-support tools. According to Richardson (2011), the lack of computer skills, broken computers, internet service, and language skills are the common problems teachers face when implementing ICT in their schools. These studies' findings are similar to what the current study has found.

CONCLUSION

The current study used a quantitative approach using survey methodologies, with the objectives of examining how Cambodian teachers felt about using ICT in the classroom, their degree of ICT training, and the difficulties associated with the technical infrastructure and support for ICT in schools. The results indicated that every teacher favored using ICT in the classroom. Less than half of them employ ICT in their teaching, although most feel confident in their ability to do so. The research also reveals that while most instructors have received training in ICT, they only have rudimentary computer literacy. The majority of them concurred that access to computers and the internet was their biggest difficulty. Thus, the ICT readiness of some rural school teachers in Cambodia is quite inadequate at this stage. Therefore, the current study suggests the following recommendations:

It is recommended that ICT infrastructure should be provided to rural secondary schools for effective teaching and learning processes since it is the basic stage of equipping the students with the necessary skills and knowledge for national development. Teachers should be provided with the necessary ICT training to be familiar with modern pedagogy for imparting knowledge and skills and possibly become part of the curriculum structure for their professional training.

Modern ICT laboratories should be built for our secondary schools to accommodate enough students simultaneously, considering their population size for effective and efficient teaching and learning environment. It is also suggested that policymakers be clear about their ICT policies. They should have a direction to implement these policies by following the necessary guidelines. Furthermore, teachers in the 21st century should also try to learn how to use technology in education to apply knowledge and skills to their students. Em et al. (2021) noted that knowledge of technology in education is one of the teachers' qualifications these days. Therefore, all the related parties should seriously consider the current results and take action to promote the improvement of ICT use in schools, especially those in rural areas. Not different from other studies, the present study also has some limitations. The number of participants is still small, so a study with a larger sample size is recommended. Qualitative and mixed-methods designs are also clues for future studies regarding ICT use in the Cambodian context.

REFERENCES

Adebi-Caesar, T. E. (2012). *Assessment of ICT situation in senior high schools: A case study in lower Manya Krobo district.* [Unpublished Master's Thesis, Kwame Nkrumah University of Science and Technology].

Angeli, C., & Valanides, N. (2009). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: Advances in technological pedagogical content knowledge (TPCK). *Computers & Education, 52*(1), 154-168.
https://doi.org/10.1016/j.compedu.2008.07.006

Barde, M. (2007). *Teachers' readiness for integration of information communication and technology in the teaching of biology in secondary schools of Bauchi state, Nigeria.* [Doctoral Dissertation, Kenyatta University].

Chuang, H. H., & Ho, C. J. (2011). An investigation of early childhood teachers' technological pedagogical content knowledge TPACK in Taiwan. *Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi*, *12*(2), 99-117. https://dergipark.org.tr/en/pub/kefad/issue/59495/855162

Carnoy, M. (2004). Las TIC en la enseñanza: posibilidades y retos. *Lección Inaugural Del Curso Académico*, *2005*, 1-19. http://www.e-historia.cl/cursosudla/12-EDU603/textos/24%20%E2%80%93%20Martin%20Carnoy%20%E2%80%93%20Las%20TIC%20en%20la%20ense%C3%B1anza%20(1-18).pdf

Drent, M., & Meelissen, M. (2008). Which factors obstruct or stimulate teacher educators to use ICT innovatively?. *Computers & Education*, *51*(1), 187-199. https://doi.org/10.1016/j.compedu.2007.05.001

Em, S. (2021). Challenges of online learning during the COVID-19 pandemic: A survey of Cambodian high school students. *Cambodian Journal of Educational Research*, *1*(2), 96-108.
https://cefcambodia.com/2021/07/07/challenges-of-online-learning-during-the-covid-19-pandemic-a-survey-of-cambodian-high-school-students/

Em, S., Nun, N., & Phann, S. (2021). Qualities, personal characteristics, and responsibilities of qualified teachers in the 21st century. *Cambodian Journal of Educational Research*, *1*(2), 49-63.
https://cefcambodia.com/2021/11/18/1191/

Em, S., Phann, S., & Khan, S. (2022). Cambodian EFL university students' perceptions of online learning effectiveness during COVID-19 pandemic: A survey study. *Cambodian Journal of Educational Research, 2*(2), 0-0.

Fakeye, D. O. (2010). Assessment of English language teachers' knowledge and use of information and communication technology (ICT) in Ibadan Southwest Local Government of Oyo State. *American-Eurasian Journal of Scientific Research, 5*(4), 270-276.
https://idosi.org/aejsr/5(4)10/8.pdf

Galanouli, D., Murphy, C., & Gardner, J. (2004). Teachers' perceptions of the effectiveness of ICT-competence training. *Computers & Education, 43*(1-2), 63-79. https://doi.org/10.1016/j.compedu.2003.12.005

Heng, P. (2019, September 30). *Digitizing Cambodia's economic future.* Khmer Times. https://www.khmertimeskh.com/565882/digitising-cambodias-economic-future/

Houn, T., & Em, S. (2022). Common factors affecting grade-12 students' speaking fluency: A survey of Cambodian high school students. *Jurnal As-Salam*, *6*(1), 11-24.
https://www.jurnal-assalam.org/index.php/JAS/article/view/360

Jager, A., & Lokman, A. H. (2000). *The impact of ICT in education: The role of the teacher and teacher training*. WorldCat: Stoas Research. https://www.worldcat.org/title/impact-of-ict-in-education-the-role-of-the-teacher-and-teacher-training/oclc/67376873

Jung, I. (2005). ICT-pedagogy integration in teacher training: Application cases worldwide. *Educational Technology & Society, 8*(2), 94-101. https://www.jstor.org/stable/jeductechsoci.8.2.94

Khan, M. S. H., Hasan, M., & Clement, C. K. (2012). Barriers to the introduction of ICT into education in developing countries: The example of Bangladesh. *International Journal of Instruction*, *5*(2), 61-80.
https://dergipark.org.tr/en/download/article-file/59739

Law, N. (2008). Teachers learning beyond knowledge for pedagogical innovations with ICT. In Law. N (Ed), *International handbook of information technology in primary and secondary education* (pp. 425-434). Springer. https://link.springer.com/chapter/10.1007/978-0-387-73315-9_25

Law, N., Pelgrum, W. J., & Plomp, T. (2008). *Pedagogy and ICT use in schools around the world: Findings from the IEA SITES 2006 study*. Springer Science & Business Media.

Lim, C. P., Pek, M. S., & Chai, C. S. (2005). Classroom management issues in ICT-mediated learning environments: Back to the Basics. *Journal of Educational Multimedia and Hypermedia*, *14*(4), 391-414. https://www.learntechlib.org/p/5867/

MoEYS. (2004). *Policy and strategies of information and communication technology in Cambodia education*. Phnom Penh: Ministry of Education, Youth and Sport. http://www.moeys.gov.kh/index.php/en/policies-and-strategies/ict-in-education-cambodia.html#.YwKkm3bMI2w

MoEYS. (2010). *Master plan for information and communication technology in education 2009-2013*. Phnom Penh: Ministry of Education, Youth and Sport. http://www.moeys.gov.kh/index.php/en/policies-and-strategies/esp-2009-2013.html#.YwKk1HbMI2w

MoEYS. (2015). *Curriculum framework of general education and technical education*. Phnom Penh: Ministry of Education, Youth and Sport. http://www.moeys.gov.kh/en/dge/2328.html#.Ys90I3ZBw2x

MoEYS. (2016). *Policy guidelines for New Generation Schools for basic education in Cambodia*. Phnom Penh: Ministry of Education, Youth and Sport. http://www.moeys.gov.kh/index.php/en/policies-and-strategies/2468.html#.YwKk_3bMI2w

MoEYS. (2019). *General Secondary Education*. Phnom Penh: Ministry of Education, Youth and Sport. http://www.moeys.gov.kh/index.php/en/general-secondary-education.html#.YwKmbHbMI2w

Nunan, D., & Lamb, C. (1996). *The self-directed teacher: Managing the learning process*. Cambridge: Cambridge University Press. https://eric.ed.gov/?id=ED394351

Richardson, J. W. (2011). Challenges of adopting the use of technology in less developed countries: The case of Cambodia. *Comparative Education Review*, *55*(1), 8-29. https://www.journals.uchicago.edu/doi/abs/10.1086/656430

Richardson, J. W. (2008). ICT in education reform in Cambodia: Problems, politics, and policies impacting implementation. *Information Technologies & International Development*, *4*(4), 67-82. http://itidjournal.org/index.php/itid/article/view/311.html

Salehi, H., & Salehi, Z. (2012). Challenges for using ICT in education: teachers' insights. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 2(1), 40-43.
http://ijeeee.org/Papers/078-Z00061F10037.pdf

Shin, D. H., Shin, Y. J., Choo, H., & Beom, K. (2011). Smartphones as smart pedagogical tools: Implications for smartphones as u-learning devices. *Computers in Human Behavior*, 27(6), 2207-2214.
https://doi.org/10.1016/j.chb.2011.06.017

Sife, A., Lwoga, E., & Sanga, C. (2007). New technologies for teaching and learning: Challenges for higher learning institutions in developing countries. *International Journal of Education and Development Using ICT*, 3(2), 57-67.
https://www.learntechlib.org/p/42360/

Smeets, E., & Mooij, T. (2001). Pupil-centered learning, ICT, and teacher behavior: observations in educational practice. *British Journal of Educational Technology*, 32(4), 403-417.
https://doi.org/10.1111/1467-8535.00210

Tan, C. (2007). Education reforms in Cambodia: issues and concerns. *Educational Research for Policy and Practice*, 6(1), 15-24.
https://link.springer.com/article/10.1007/s10671-007-9020-3

Teo, T., Chai, C. S., & Hong, H. Y. (2009). Singaporean and Taiwanese pre-service teachers' beliefs and their attitude towards ICT use: A comparative study. *Asia-Pacific Education Researcher*, 18(1), 117-128.
http://researchrepository.murdoch.edu.au/id/eprint/48725

Tess, P. A. (2013). The role of social media in higher education classes (real and virtual): A literature review. *Computers in Human Behavior*, 29(5), A60-A68.
https://doi.org/10.1016/j.chb.2012.12.032

Tinio, V. L. (2003). *ICT in education: e-Primers for the information economy, society, and policy*. New York: United Nations Development Programme.

Tondeur, J., Van Keer, H., Van Braak, J., & Valcke, M. (2008). ICT integration in the classroom: Challenging the potential of a school policy. *Computers & Education*, 51(1), 212-223.
https://doi.org/10.1016/j.compedu.2007.05.003

Williams, D., Coles, L., Wilson, K., Richardson, A., & Tuson, J. (2000). Teachers and ICT: Current use and future needs. *British Journal of Educational Technology*, 31(4), 307-320.
https://doi.org/10.1111/1467-8535.00164

Yuen, A. H., Law, N., & Wong, K. C. (2003). ICT implementation and school leadership: Case studies of ICT integration in teaching and learning. *Journal of Educational Administration*, 41(2), 158-170.
https://www.emerald.com/insight/content/doi/10.1108/09578230310464666/full/html