



# Teachers' Experience and Attitudes for Educational Application: A Case Study of a Local Secondary School in Hong Kong

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**Abstract:** Since its first ICT education policy statement had been implemented in Hong Kong in 1998, the focus has shifted from equipping classroom with ICT to the use of technology at the right time for the right task. Currently teachers and students have ample opportunities to access and use free and commercial tools for education purpose. However, there is not much research on how teachers use them and what factors influence their adoptions. This study interviewed 9 teachers in different subjects in a local secondary school to examine what their experience and perceptions were for educational apps. It is found that teachers have a positive attitude to these apps and they are eager to learn more about them. Owing to the lack of time, good quality resources and training, we suggest successful case-sharing, well-organized workshops, and effective time use to increase teachers' confidence and develop teachers' capabilities.

**Keywords:** Educational application, Teachers' expectations and needs, Teachers' attitude and preference, Case study

## 1. Introduction

Since the new online App Store was established in 2008 (Info), the number of application software dramatically increased from 800 in July 2008 to 1,200,000 by June 2014 (Costello), and the software acquired a new popular name: App (Application). These apps enhance social networks among users, and educational apps also reinforce the learning relationships between teachers and students, support professional development, and facilitate content creation and sharing.

Secondary school students are the main target audience of these online educational apps. However due to the limitation of access to online accounts, most students feel more convenient to use the paid desktop apps or those on school iPads. But the target product that meets the teachers' need is not easy to find, because their preferences are for both teaching and learning. Some researches (Fullan, 1993; So<sup>1</sup> & Swatman, 2006; Wang, 2002) point out that the way teachers teach is a product of their own schooling, training, and experiences. If a teacher has not received the corresponding professional development to master the technologies they would use in class, they would not have the confidence to appropriately combine them with their pedagogical knowledge and content/subject knowledge (Archambault & Barnett, 2010; Graham et al., 2009; Koehler & Mishra, 2009). Therefore, Technological Pedagogical Content Knowledge (TPACK) helps teachers to have a deep understanding of the integration of

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technology with pedagogical knowledge and content knowledge when teaching (Koehler & Mishra, 2009). Their understanding will reflect on the selection of the technology, which will influence their teaching quality and students' learning improvement. Reciprocally, the corresponding influence will update teachers' pedagogical knowledge and content knowledge. Besides, there are many other dimensions affecting teachers' choice and use of the educational apps, such as attitude, expectations and needs, appropriate resources, training time, and support.

This study investigates teachers' experience, attitudes, and the factors influencing teachers' decision in selecting and applying educational apps. Some recommendations for schools were provided in order to help teachers increase their confidence and develop the capability for using educational apps for teaching and learning.

## **2. Method**

### *2.1 Participants*

A local secondary school was approached for this study as it was equipped with various facilities to support the e-learning environment and the new administration team is eager to promote ICT-based teaching and learning from a basic level to higher level. Moreover, the principle of this school is pretty favoring the integration of teaching and technology. Invitations were sent out in the school and 9 teachers (4 female and 5 male) finally participated in the study. Three of them teach science subjects (Science, Chemistry, Biology), five teach language subjects (Spanish, English and Putonghua) and one teaches handicraft Class (Design and Technology).

### *2.2 Data Collection and Analysis*

Teachers were interviewed and each interview is about 15-25 minutes. Interview questions were semi-structured, and focusing on the issues such as "what the expectation do you like your students to achieve by using the apps" and "why do you want to use apps in your teaching". We summarize and sort out each teacher's interview into the five aspects: attitude, expectation, preference, influence factors, and support. According to these key words of different teachers in different aspects, we can conclude the teachers' general answer or thinking and the tendency they want to express on the attitude, expectation and preference. As for the influence factors, we list the educational apps that teachers are using in class currently. Then we count the number of users on each app to see the most popular apps in general, and discuss the reasons why most teachers would like to use them. Moreover, we separate the different subjects (science and language) to look at the popular apps again and analyze this preference based on TPACK. And for the support, we conclude with the teachers' experiences of support and what in their opinion would be an improvement.

## **3. Results and Discussion**

### *3.1 Attitude & Preference*

Teachers agree that the apps are necessary for teaching in e-learning environment. One Spanish teacher states "the daily life communication is limited while the apps help students to practice more than the traditional way". Yet, they prefer good quality, specifically-designed, official apps. One English teacher expressed "I don't like using too many platforms for my students, and I prefer the official resources". Therefore, teachers would like to use more appropriate educational apps that are suitable for their subjects. Before using these apps, teachers intend to try them intimately. One chemistry teacher said, "I would like to have a try to see whether they are appropriate for my class". All in all, these teachers have a positive attitude towards educational apps.

Google Apps is the most popular app among all teachers. It is because on one hand teachers can use school-based Google account to manage the day-to-day work, which is safe and easy. On the other hand, the aligned Google Apps allow teachers to combine general working and teaching through only one Gmail account, which saves teachers' time managing different files.

However, teachers' preference on using these apps varies in the different subjects. We separate the educational apps in two dimensions: creating and sharing. For example, Google Apps, J2E, and VoiceThread, these apps offer platforms for users to create original learning content and edit secondhand resources, or facilitate users management of learning materials. But like YouTube, e-book, and word-reference, the ownership of the resources in these apps belongs to others. The main purpose of these apps is as references to assist learning.

Table 1 shows that science teachers tend to use educational apps for creating and managing, whereas for language teachers, there is no obvious preference, which means they seemed like to use all kinds of apps that are appropriate for their teaching and learning.

Table 1. Teachers' preference on the educational application

Preference	Subject	
	Science	Language
For Creating and Managing	➤ Google Apps	➤ Google Apps
	➤ Nearpod	➤ Edmodo
	➤ Edmodo	➤ Three Ring
	➤ J2E	➤ Storytelling Apps
	➤ Keynote	
	➤ Dropbox	
For Using and Sharing	None	➤ YouTube
		➤ TED
		➤ Word Reference
		➤ Online Games

The subject of secondary school science is characterized by a tradition and requirement for practical work (Baggott la Velle, Wishart, McFarlane, Brawn, & John, 2007). Therefore, combined with the traditional pedagogical content knowledge, the benefit of educational apps in science education is “the models of the idealized system can be animated alongside a simulation of the real system to reinforce the relationship between practice and theory (McFarlane & Sakellariou, 2002)”. In this school, science teachers like using Nearpod to have a real-time test to examine the students' performance on a particular area of knowledge. One biology teacher indicated that all the students can do the same things simultaneously, and importantly, the teacher can control the platform to use it for teaching, do a quiz or examination. It helps the teacher to analyze which part of the theoretical knowledge should be focused on immediately. Moreover, some teachers would like students to use apps like Google Apps, J2E, Keynote plus the stimulate experiment apps to record, manage, and present the experiments they do in class. Teachers intend students to learning by doing. However, at present, there is limited access to reliable subject-specific resources. A chemistry teacher said: “Some apps just like an e-book.” Furthermore, although most teachers say they want to try more apps, the science curriculum is overloaded with content and the assessment requirements mean they lack of the time to experiment with more appropriate educational apps (Osborne & Hennessy, 2003).

Language teachers would like to use all kinds of appropriate apps on both the creating and sharing dimensions. As we can see from Table 1, these apps ideally provide opportunities for collaboration and interaction. A Spanish teacher indicated that game apps in Spanish offer opportunities for students to play by learning. Because students want to win the game, they have the motivation to use the wordreference to translate the language to understand the context deeply. But examples of sophisticated pedagogical thinking are explored to demonstrate that it is perhaps not so easy to transform the learning process with these apps (Gray, Pilkington, Hagger-Vaughan, & Tomkins, 2007). Although these apps provide a natural context for learner autonomy, that autonomy needs to be developed systematically, which teachers' instruction needs to be skillfully supported for learners to benefit from these apps

(Murray, 2005). One English teacher said, “Don’t be too ambitious on the educational apps. Even if different teachers use the same apps, the learning outcomes or performance would not be the same”. Because learning outcomes are set by each teacher, they choose the apps based on their own particular purposes.

Perhaps what matters most is the individual teacher’s ‘feel’ of how the changes that they are making are meeting their own personal priorities and needs; the technology becomes a tool in the ongoing organic development of the teachers’ practice, rather than an instrument of imposed transformation. (Gray et al., 2007)

### 3.2 *Expectation & Influence Factor*

Teachers’ expectations on educational application list as below:

- Enhance students’ engagement and confidence
- Offer a better interactive environment
- Provide appropriate of good quality learning materials
- Give 1:1 feedback
- Help students’ self-directed learning
- Access to learn in- and out-side school

If the teaching can be more interesting, and more engaging, students will be more motivated to learn (Cox, Preston, & Cox, 1999). Thus, teachers prefer to use the apps that have an interactive nature, because the interaction offers more opportunities for students to express their ideas, which engage them to take part in the activities and concentrate on the lecture. At the same time, teachers need good quality apps that meet the requirement of the specific subject learning outcomes, teaching and learning activities, and assessment tasks. Teachers are glad to see the apps that could help students’ self-directed learning outside school. Furthermore, under the ICT experts’ helping, teachers may create their particular apps based on both teachers’ and students’ needs in the future.

A number of factors were identified to influence teachers’ choice of apps. These factors can be categorized as content factor and function factor.

Table 2. Influence Factors on choosing educational application

Dimension	Factors
Content	➤ Engagement/Interesting
	➤ Access to retrieval
	➤ Possess abundant continuous renewed database
	➤ Pretty appearance
	➤ Easy to use/Convenience
	➤ Real time presentation
Function	➤ Monitoring/Tracing
	➤ Collaboration
	➤ Interaction
	➤ Giving feedback

Both science subject and language subject teachers will consider convenience and engagement as the main factors to select educational apps. Specifically, science teachers also focus on the interaction (e.g. a Biology teacher mentioned she would use NearPod for group-based discussion, and a Chemistry teacher said he would like students to use all the apps to facilitate their group work), and language teachers are concerned with the real-time presenting function mentioned above (e.g. an English teacher intends to use Google Docs to present or edit the content in real time in class, another English teacher would like use TED videos to present the particular content for the students to practice listening). Beside, because of the nature of the subject, the Design and Technology teacher would like students to use whatever apps that will support their design.

As mentioned before, this school is at the initial stage of using educational apps in class. Teachers need more successful cases and more confidence in using the apps. First of all, due to the time limitations, the apps should be easy both for teachers and students to manage, assess and even trace students' learning. Otherwise, teachers' confidence in them would be reduced, which would affect the sustainable and scalable usage. Secondly, only if the students are interested in the class, can they concentrate on the lecture and interact with teachers. Then teachers would be more motivated in their teaching. Thirdly, science teachers prefer problem-based learning that calls for collaboration and cooperation. One chemistry teacher said, "I hope they can have a better discussion by using the apps on iPad." Yet, for language teachers, besides the factors of easy to use and engagement, they like the real-time presenting function because they can use apps to control the lecture when they have a general question or explanation. At last, in different stages of educational apps use, the influence factors are different. When the teachers' capability improves from the basic level to intermediate or advanced level, their attitude and confidence will change as well.

### *3.3 Support*

Recently peer-working and networking as well as by the latest government approach to ICT training as "Hands-on support" is an efficient mode of sustaining professional development (Gray et al., 2007) in this school.

#### *3.3.1 Peer-working*

Science subject department is keener to use educational apps in this school. One chemistry teacher has expertise in ICT in education and he always holds some individual workshops for the other subject teachers based on their needs. One biology teacher said, "He will give me individual instruction on using these apps if I have problems" And ICT teachers will help peer teachers to deal with these apps as well. They have a positive influence on each other. However, as one teacher mentioned, they need more successful cases and more recommendations of appropriate resources. In addition to peer teacher support, peer schools experience sharing and exchange visits are also important to support ICT in education.

#### *3.3.2 Networking*

This school has a connection with Apple, Google, and some other commercial education-related companies. They will get help from these companies for professional development. One chemistry teacher said, "Sometimes, we have the training from the education department of Apple on how to use the apps on iPad." The networking with these companies helps school become aware of and select more appropriate educational apps. Nonetheless, these apps may be based on general usage instead of teacher-specific needs. And some teachers prefer the official educational apps rather than the commercial ones. For example, one English teacher expressed she would select the apps that were recommended by official authorities.

#### *3.3.3 Government Support*

The Education Bureau of Hong Kong will hold some conferences and workshops each term. Teachers have the opportunities to see what is happening in IT in education on some conferences, and learn some IT skills in some workshops. A Spanish teacher expressed that the workshops held by the government always teach a basic knowledge or skill that did meet some skillful teachers' expectations.

Above all, although teachers get the support from different dimensions, the support do not cover all the teachers' needs. We should give school-based support that is more suitable to the school e-learning background and digital culture.

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