An Action Research in Hong Kong: How Does e-Learning Act as a Catalyst for Change in Pedagogy?

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Abstract—Nowadays, students of the twenty-first century shake their heads to traditional learning methods which they think are dull and spoil their interest in learning. Learning is all about motivation and is the most effective when students have an internal interest in a particular topic. With the rapid development of information technology, students indeed regard technology as part of their life. As a result, e-learning and the use of online resources have become the major trend in education in recent years. This paper focuses on how e-learning has changed and enhanced the way of teaching and learning. Action research has been conducted on two subjects - English Language and Science Education. The observation reveals that through understanding students' needs and interests, integrating e-learning into lessons have helped teachers to teach meaningfully and students to learn successfully.

Index Terms—E-learning in Hong Kong, learning motivation, effective learning.

I. INTRODUCTION

Recent years have seen increased attention being given to e-learning in the education field. Many scholars have shown a positive attitude towards the use of information technology in education, thinking that learning can be more effective [1], [2]. In the United Kingdom, Ofsted [3] recommended schools to set up a systematic e-learning environment outside classroom so as to improve students' experience in information and communications technology. In Hong Kong, the Education Bureau (formerly known as the Education and Manpower Bureau) has proposed three different plans regarding information technology in education since 1998. In 2010, the Government provided sixty-eight million Hong Kong dollars for the "School e-Learning Pilot Project" to provide resources for the education sector to introduce e-learning.

According to "Textbooks and e-Learning Resources Development" Task Force report of Hong Kong Education Bureau, e-learning serves three main elements which are
1)   An electronic tool;
2)   electronic learning resources; and
3)   e-learning courses.

This study will be starting from a psychological theoretical level, coupled with frontline teachers' classroom practice, analyzing how the use of e-learning elements facilitates teaching and learning.

II. BACKGROUND

Hong Kong's education sector has introduced computer curriculum early in the eighties. The new generations of young people who have access to computers from a young age are called "Digital Native" [4], [5] or "Screenager" [6]. According to the Hong Kong Census and Statistics Department, near 80% of households have personal computers at home. Households using broadband connection even reached 82.3%. With the rapid development of computer technology, the existing home computers have been equipped with high-speed processors and high-capacity memory, suitable for multimedia playback. Thus, computers and the Internet in Hong Kong have gained a high degree of popularity; hence provide favourable conditions for the use of multimedia for e-learning.

E-learning in the education sector is not only about computer hardware, network set up and teacher development, but also gradually moving towards students. Purchasing electronic textbooks, using online learning platform and cooperating with software companies to develop e-learning packages are not uncommon nowadays in Hong Kong. However, business people and technicians of different areas of expertise are generally unable to understand the real needs of frontline teachers, hence e-learning may not effectively play its performance.

III. DIFFICULTIES AND CHALLENGES FRONTLINE TEACHERS ARE FACING

Difficulties are inevitable during the implementation of e-learning. Based on past experience as well as co-workers' sharing, the problems faced are summarised in the following three aspects:

A. Failure to Effectively Coordinate Hardware and Software Configurations

This is the most common problem encountered by frontline educators. For instance, the status of computers or browsers is not updated in line with new teaching materials; no instructions are provided to install the plug-in. More serious problems include the breakdown of campus network when hundreds of students log into the system. Apparently, these problems can be obstacles for teachers to carry out their lessons efficiently.

B. Different Opinions among Parents, Teachers and Schools on e-Learning

The Education Bureau and school administrators have advocated the use of e-learning as its effectiveness has long been supported [1]. However, the public still carries a relatively conservative attitude towards e-learning. Rosas *et*

al. [2] also pointed out that it was likely for teachers and parents to oppose significantly against e-learning during its early stages of promotion. The main reason is that before seeing the success of e-learning, they are worried that students may be addicted to the electronic world rather than genuinely learning through information technology.

C. The Current e-Learning Methods Suggested Cannot Improve Learning Interests and Achievements

At present, the most popular and commonly-used e-learning programme is believed to be the online self-learning systems of English and Chinese Language. Many primary and secondary schools have to integrate them into the curriculum in order to provide more opportunities for students to listen, speak, read and write at home as well as to cater for learner diversity. The online learning systems involve fewer human resources, are rich in content and also contain incentive schemes. However, the reality is not necessarily satisfactory; the following are the feedback of some of the e-learning students:

"Doing online exercises means using the search engines for answers. You see, many people are sharing answers online!" (Student A)

"In this online platform, we have three chances to answer the questions. The order and options of each question never change. So, I can finish the exercise in a short time with a high score. Then, I can have more time to use the Internet for my own leisure." (Student B)

Summing up the above three major difficulties, the first two cases can be solved immediately through sufficient communication. Currently, as the development of e-learning is still in its infancy, many service providers aim to win a larger market share. As a result, they introduce a considerable amount of electronic question banks and other teaching resources to support teaching and reduce teachers' workload. In fact, these resources are only an electronic version of the printed textbooks. If teachers or the systems simply reward students who answer a question correctly after reading online, and expect this behavioral incentives package can motivate students to learn independently, then it seems a little far-fetched. The above feedback from the two students is indeed worthy of evaluation. It is expected to have the existing e-learning products integrated into the online world, but these products are an intruder. To make e-learning becomes meaningful, we must understand students' needs in order to improve their motivation to learn.

IV. THEORETICAL FOUNDATION

A. Meaningful Learning

Mayer advocates meaningful learning rather than rote learning [7]. In rote learning, students can only take advantage of repetition of existing knowledge to solve problems; while in meaningful learning, students not only remember the knowledge, but also use the existing knowledge in different situations in order to solve problems.

This is the learning model proposed by constructivism. Students should take the initiative to explore and identify problems but not passively absorb knowledge from the teacher.

B. Motivation

Motivation is the force that energizes and directs a behavior towards a goal [8]-[11]. Motivation is the process of teaching an important element. Students who love learning can explore and learn anything, but make sure all students in the classroom can enjoy the learning process; the teacher shall arouse students' motivation to learn the subject.

C. Intrinsic Motivation

Intrinsic motivation is defined as people engaging in the learning process because of their interest in it. This motivation is internal, so no additional incentive is needed as the activity itself is the greatest driving force [12]. Conversely, extrinsic motivation is caused by external factors such as praise and prize. People are interested in the learning outcomes or rewards rather than the learning process or knowledge [13].

D. Five Basic Needs

The Hong Kong Federation of Youth Group has analyzed the reasons for teenagers' interest in using the Internet and the results are worthy of our attention to the implementation of e-learning. First, young people think that they can establish their own identity in the online world to help meet social needs. On the other hand, the virtual world brings a sense of success. Psychologist William Glasser [14] has described that each act of life is to satisfy the five needs, which include survival, a sense of belonging, power and a sense of achievement, autonomy and fun. Among the five needs, autonomy and a sense of achievement are the two most important needs. Applying the intrinsic motivation theory, teenagers are engrossed in the Internet because it gives them satisfaction and they enjoy the process.

E. Identity

In reality, youngsters often find it difficult to confirm one's identity and some even engage in identity crisis. However, in the electronic world, digital natives can get identity recognition easily [15]. Therefore, many parents have found that their children are frantic in connecting to the Internet, especially social networking websites, not to mention playing online games which is an important way for them to gain recognition and a sense of power.

F. Way of Thinking

Creativity and knowledge management theory proposes two ways of thinking — vertical and lateral thinking. Traditional learning focuses on vertical thinking which categorizes knowledge and stores in the brain. As for lateral way of thinking, it processes between different categories organised via vertical thinking so as to find a solution for a problem. The triple enrichment mode, high-level questions require students to use lateral thinking to discover the problems themselves, then to explore, research, and finally solve the problem [16].

V. ACTION RESEARCH IN ENGLISH LANGUAGE AND SCIENCE EDUCATION

Action research has been conducted in two subjects – English Language and Science Education.

A. English Language

Students on different subjects have different levels of motivation to learn. Some subjects are fun to students and can trigger their interest to learn so teachers do not have to provide extrinsic motivation. However, it is not surprising that traditional learning methods can hardly motivate students to learn effectively in this era, especially for lower achievers, who perceive learning English as a second language a great challenge and a boring process. Therefore, this action research is conducted to rekindle students' intrinsic motivation to learn with the help of e-learning.

In English Language learning, vocabulary learning occupies a certain degree of importance. According to the vocabulary learning theory [17], students learn a second language through the following steps:
1) noticing;
2) retrieving; and
3) generating.

In this section, learning descriptions on human facial features has been used as an example. In traditional learning process, the teacher first taught students the vocabulary items and had dictations with them so as to help transfer the words into their long term memory. Finally, quizzes and tests were given so as to consolidate and assess their understanding.

As predicted, students did not show effective learning through traditional learning as students were uninterested in the subject. Therefore, the teacher tried to use some electronic resources such as online puzzles and word search games to help students learn. As in Fig. 1, the word search game includes vocabulary items related to facial features. These electronic resources not only helped students to visualise various vocabulary items, but also improved students' interest and motivation to learn English. However, these resources which are defined as e-learning are merely printable online worksheets and games. These resources were more interesting than learning through blackboard and chalk, but still failed to inspire students to learn with intrinsic motivation, enjoy the learning process and self-learn.

Fig. 1. Printable online worksheets and games.

In view of this, researchers tried to understand and collect information on students' interest and what triggered their intrinsic motivation in the online games that they often play. Having known that students would be interested in making criminal faces using jigsaw puzzles, this activity became the major e-learning method to learn facial descriptions. As in Fig. 2, the website shows different facial features and provides a platform for students to make different faces. After making the faces, students were asked to describe the faces using the vocabulary items learnt. Students were interested in playing the jigsaw puzzles [18].
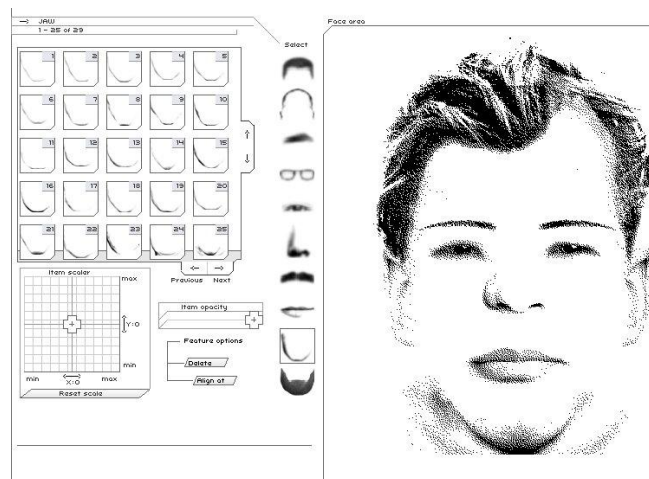

Fig. 2. Online jigsaw puzzle.

According to Guthrie & Cox [19], authentic learning in the classroom can significantly improve students' intrinsic motivation to learn various topics. Therefore, to further their learning, the teacher found free online software. As in Fig. 3, the teacher first introduced web-based application software "Bebeline Game" [20] and played a recording session to simulate real-life police as a witness statement-taking process. Students could use electronic tools to collage prisoners images. As the software is free online software, students can also use it to self-learn outside the classroom.

Fig. 3. Web-based application software " Bebeline Game".

Surprisingly, the students completed their class exercises and found it interesting to look at each other's collage. Thus, it showed that students' intrinsic motivation was stimulated by e-learning. This vocabulary learning process was meaningful to students as e-learning has made the memory process fun and it was also practical.

B. Science Education

Science education emphasizes theories, formulae and logics. In Hong Kong, most teachers use a traditional method to teach science, that is to show the theories to students and proving the correctness of the theories by formulae. However, this method cannot motivate students to explore and learn.

According to Leidner and Jarvenpa [21], the use of information technology can facilitate student access to information to improve the availability or reality of learning materials. At the same time, students can be motivated by the visual materials and start inquiry learning by themselves. Therefore, the researcher tried to use some information technology tools such as interactive computer software and mobile apps in teaching these subjects.

In science education, some experiments are dangerous, for example, the dilution of acid and alkaline, and cannot be done in school laboratory. Teachers usually tell students the process and results and ask them not to do in the laboratory. However, students cannot visualize the situation. Therefore, the researcher integrated a school based mobile application to the lesson. As in Fig. 4 and 5, the application simulated the dangerous experiment so students could experience the simulated explosion for a wrong procedure.

Fig. 4. Mobile Apps: the dilution of acid and alkaline.

Fig. 5. Simulated explosion for a wrong procedure.

By integrating the e-learning materials into the curriculum, students found that learning became meaningful. They were motivated by the visualised animation and were willing to find out the cause and effect of the phenomenon

However, the above strategy cannot provide enough motivation for self-learning nor becoming problem discoverers, explorers and solvers [16]. Therefore, the researcher established an online platform through Web2.0 for students to chat instantly. By using the online platform, students could read, discuss and search information at the same time, as a result, it strengthened students' lateral thinking.

VI. CONCLUSION

E-learning is believed to play a large role in enhancing students' motivation to learn and has contributed to the gradual change of pedagogy in recent decades. No doubt, there are numerous ways to implement e-learning, however, if teachers want to develop a teaching method to make learning meaningful, it is of paramount importance that they first understand students' needs and interests. Otherwise, it will only be an increase in teacher workload and a decrease in learning motivation.

This study suggests that purchasing a lot of hardware does not necessarily contribute to the success of e-learning. Instead, it is essential for teachers to gain insights through trial and error as well as to explore more existing and free resources in order to design a suitable e-learning package for their students.

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