

A Study on Deep Integration of One-to-one Digital Learning into EFL Teaching

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Abstract—English Learners' initiative and enthusiasm for English learning and research are fully aroused in such active learning environment as self-exploration, multiple interaction, cooperative study, and resources sharing under the support of information technology. One-to-One Digital Learning is the innovative upgrade in education on the basis of informatization learning. Chinese formal research in this area began from one-to-one digital learning program supported by Intel Company in 2007. The paper mainly discusses theoretical basis and approaches to integrate one-to-one digital learning model into EFL teaching, which include the construction of the specific learning environment appropriate to this particular learning model, and the construction of the integrated framework composed by three stages: pre-class self-exploration study based on problems, in-class group cooperative study based on projects, and after-class reflective and deep study based on contents. One-to-one teaching is an educational practice to optimize resources and teach students in accordance with their aptitudes in the modern society. To promote deep integration of information technology into EFL teaching renders assistance in sharing high-quality English resources and constructing creative models for developing English talents.

Index Terms—one-to-one digital learning, EFL teaching, integrated framework of one-to-one digital learning in EFL teaching

I. INTRODUCTION

The rapid development of information and network technology has brought forth revolutionizing influence on Chinese education. To resolve the problems in the process of education and teaching with the assistance of information technology and to realize the deep integration of technology into education gets to become the central concept to guide the Chinese educational development. Nowadays, one-to-one digital learning represented by one student with one digital device turns to the research focus, which refers to a new learning pattern in which each student owns a computer or a smart phone connecting with teachers' computer and network to realize online teaching and learning anytime and anywhere. (Yu & Chen, 2007) Being as a brand-new educational atmosphere, one-to-one digital learning reflects the educational concept of taking the human being as the fundamental point of education. Teaching contents and learning resources should be designed and provided according to the students' specific features and individual requirements which just corresponds to Chinese traditional educational principle: **to teach students according to their aptitudes**.

In the process of EFL teaching generally involving three teaching steps of pre-class, in-class and after-class, English teachers tend to put computers, network learning platform, and smart phones into full play. At first, they should construct a one-to-one digital learning environment under the support of digital software and hardware, and network resources as well. Then, in this shared learning environment, teachers and students can interact and cooperate to conduct online test, interactive discussion, and subject exploration. One-to-one English digital learning environment, as a totally fresh environment revolving around the students, enhances the students' English learning efficiency and enriches their English class experience. Admittedly, English teachers have to reflect on their teaching contents, teaching patterns, and evaluation systems, which triggers off English teaching and learning reforms

II. THEORETICAL UNDERPINNING OF ONE-TO-ONE DIGITAL LEARNING AND ITS RESEARCH DEVELOPMENT

A. Theoretical Underpinning of One-to-one Digital Learning

Constructivism: Knowledge can be constructed by the learners who obtain resources, tools and support from peers, experts and teachers in some social and cultural background; it cannot be passed on by others. As a result, circumstances, conversation, coordination, and meaning construction constitute four major elements of constructivism. Collection and analysis of learning resources, recording and feedback of learning process, analysis and evaluation of learning results, all these learning links between teachers and students require coordination. Conversation, also called communication, is the basic form in the process of coordination. Through communication, group members can discuss how to fulfill their required learning tasks; students can get teachers' and peers' guidance and assistance. Everyone's ideas and solutions are shared by the whole learning community which is also the birth place of individual and collective intelligence.

Learning community and distributed cognition: Learning community involves from knowledge-constructing community and finally turns to a systematic learning environment. It involves community members, the common practice, the shared dialogues, the common resources and cultures. In this learning environment, learners can obtain multiple support and contribute to their own knowledge construction and increase by means of supporting others learning. The fundamental function of learning community is reflected by social consolidation (group belonging sense, collective sense, and identified sense can meet the learners' belonging requirement and promote their participation extent) and information communication (to view the problem from different perspective can develop learners' divergent thinking and reflective abilities). (Zhao, 2005) Distributed cognition refers to the fact that cognition distributes in such matters as inside and outside of individuals, environment, media, society, culture, space, and time. (Zhou & Fu, 2002) Distributed cognition stresses not only the function of the cognitive subjects, but also that of the environment. The single cognitive element cannot hold up complicated and vital digital learning environment. Only the distributed cognitive elements bringing into their common play can make learning become meaningful.

Connectivism: Connectivism Learning Theory is known as the connective view in digital age. George Siemens put forward the theory of connectivism, thinking that learning isn't one person's activity, but the process connecting special nodes and information origin. Connectivism is a complete theoretical exploration from chaos, network, complication to self-organization. Learning is a dynamic and interactive process with inter-connection. With network and prompt terminal devices, connection tends to connect any learning elements anytime. The starting point of connectivism is individual which organizes a knowledge network to set up network connection with others. The individuals extend their own tunnel through self-formed network, and enrich knowledge to construct learning conditions. (Qiu & Gao, 2010)

B. The Research Areas of One-to-one Digital Learning Home and Abroad

Many developed countries including America, Britain, Germany, and Australia have conducted practice and research concerning one-to-one digital learning programs. Such typical programs as One-to-One Computing Initiatives joined by schools of more than ten American states, Classmate PC launched by Intel Company, and Hybrid Mobile Learning initiated by London Urban University are very popular among pupils, high school students and college students. The application of one-to-one digital learning has been developed very rapidly in extent and number, and even some schools can provide the students with 24 hours use of digital devices. Although the relative research seems simple and rough for lack of abundant teaching experience, however, most of researches conclude that application of one-to-one digital learning into different areas achieves positive results, for instance, it contributes to the improvement of computer attainments and writing competence through one-to-one digital learning devices.

In 2001, China proposed the concept of E-bag. Although the concept of one-to-one digital learning in Chinese education has been delayed several years, its technological application can date back to 2002. Many information technologies were integrated into class teaching environment, such as TI, IRS, Laptop, portable learning device with PDA style. The formal research began from one-to-one digital learning program supported by Intel Company in 2007. Intel Future Education Program is a professional development plan among global teachers, which provides supporting training for teachers, helping them develop student-centered learning activities and improve students' learning abilities. This program spurred other educational institutions to develop researches and practice of one-to-one digital learning. E-bag program initiated in Shanghai in 2010 is the launch vehicle to promote nationwide one-to-one digital learning. At present, the experimental schools to participate into this teaching program has reached 100 schools in more than 20 provinces, and these numbers will be surmounted. We should keep in mind that this brand-new learning concept introduced from foreign countries, so its native integration requires a long-term process of adjustment. Our research should put more emphasis in development of learning devices and teaching resources, construction of learning environment and teachers' professional training.

C. The Educational Reform Triggered by One-to-one Digital Learning (Xu, Song, Di & Gao, 2014)

Class reform: With information technology being integrated into class teaching, our class has been changed from traditional classroom with one piece of chalk and one mouth, one blackboard and one book to network classroom with multimedia and various learning platforms, and to mobile classroom with one computer or smart phone per student. Class teaching contents and forms are changed significantly: learning resources are enriched with intelligence, digitalization, network and multimedia; learning space is stretched to social and cyber space.

Learning contents reform: The marked feature of one-to-one digital learning contents is digitalized, running in network device and environment. In this environment, textbook isn't the single teaching content, and the students can obtain various knowledge from learning objects and resources through self-study, teachers' guidance and cooperative communication. Teachers can adopt multiple approaches to enrich closed and isolated class teaching, adding to teaching contents greatly. Meanwhile, learning forms of expression are changed from linear to electronic form which arouses learners' passion for learning and promotes knowledge construction.

Teaching concept reform: One-to-one digital learning changes teaching concept from teacher-centered to student-centered, from knowledge passing on to capability training, from teachers' single technological application to common application. One-to-one plays more emphasis on self-study, cooperative and project-based study. Therefore, such teaching strategies as resources-based self-study, platform-based cooperative study, and space-based project study

should be selected preferentially. Brain Gonzalez, the global educational chief inspector of Intel, advanced Flipped Classroom, which means educators empower the students with more freedom, encouraging them to choose the most suitable way to learn new knowledge outside the classroom and to internalize knowledge inside the classroom by means of interactive communication and discussion among teachers and students.

Learning approaches reform: After constructing one-to-one digital learning environment, learning can take place anywhere so long as the network is connected, which means learning approaches are very flexible and diverse: self-exploratory study, peer-cooperative study, group-study. One-to-one digital learning put an end to traditional passive learning approach and turned to the new one of self-exploration and cooperative interaction. In other words, learners can apply digital platform and resources to conduct discussion with teachers and peers, fulfilling cooperative learning. Learning isn't confined to the regular classroom, for every student is equipped with a computing device, beginning their study anytime and anywhere according to their interests and features. This is the combination of formal and informal learning, which can enhance learners' interests and efficiency, expanding their thinking sphere.

III. CONSTRUCTION AND PRACTICAL ANALYSIS OF ONE-TO-ONE DIGITAL LEARNING MODEL INTEGRATED INTO EFL TEACHING

A. Construction of Specific Learning Environment of One-to-one Digital Learning Integrated into EFL Teaching

Learning platform: To construct the specific learning environment corresponding to one-to-one digital learning is the first priority. At first, campus learning platform for college English should be established and operated. On this platform, massive resources of preview and review concerning college English, professional English (policing English) and self-evaluation system are installed to meet the requirements of students to complete the tasks of preview and review before and after the class. Meanwhile, the students test their learning effects at any time and these digital evaluation data will become vital component of students' formative evaluation. Fig.1 and 2 are homepages of two learning platforms in our police academy; one is Virtual Policing in English (VPIE) homepage, and the other is the homepage of Cross-cultural communication and professional English training platform for policeman.

EFL Labs: To construct several EFL Labs with computing devices including teachers' and students' computers connected with network or smart phones. It is the basic infrastructure and technological support to realize one-to-one digital learning in English class. Teachers' host computer can be connected with students' devices, carrying out interactive activities. During the class, teachers and students can explore various relative resources about the new text; teachers can transfer those personalized learning materials to students' computer or smart phone.

Interactive communication space: To construct wireless network platform and interactive communication space. In their informal learning, the students can apply their mobile devices under the students' guidance to begin their individualized English learning, participating into English practical activities. Fig. 3 is English interactive activities through online learning community Sharing & Improving in QQ group.



Figure 1: Virtual Policing in English (VPIE) homepage.



Figure 2: The homepage of Cross-cultural communication and professional English training platform for the policeman

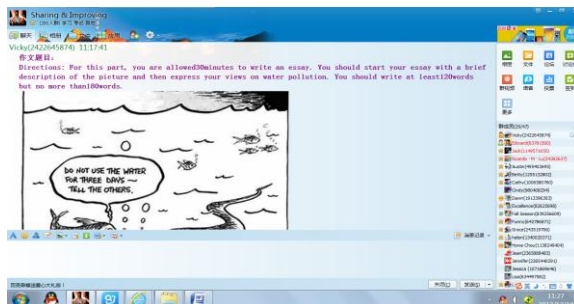


Figure 3: English composition training through Sharing & Improving Online Learning Community in English

B. Construction of Integrated Framework of One-to-one Digital Learning in EFL Teaching

The Integrated Framework of One-to-One Digital Learning in EFL Teaching includes three main stages: pre-class, in-class, and after-class. In each stage, it involves three components including technological support, learning tasks and evaluation formats.

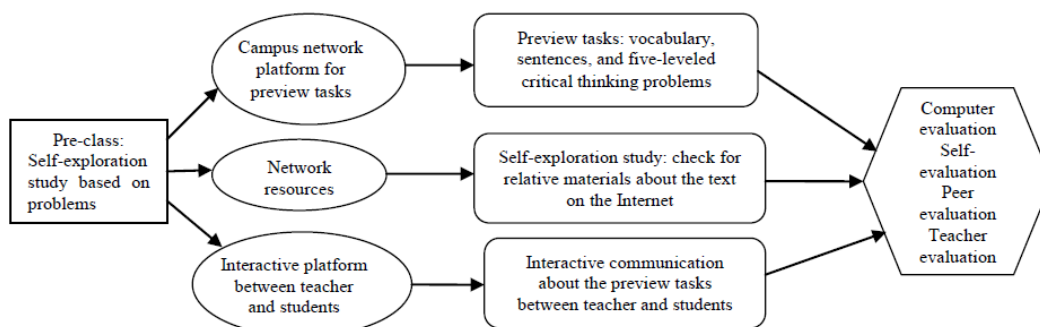


Figure 4: Pre-class self-exploration study based on problems: recourses, tasks and evaluations

Pre-class stage: In this stage, teaching objective stresses online explorative and interactive learning strategy. The students should carry out self-exploration study to seek answers for preview problems and interactive study to think the problems in different perspectives. The main technological support comes from campus network learning platform and online interactive platform. Learning tasks refer to preview vocabulary and five-levelled critical thinking problems about the text. Evaluation formats include computer evaluation, self-evaluation, teacher’s evaluation and peer-evaluation.

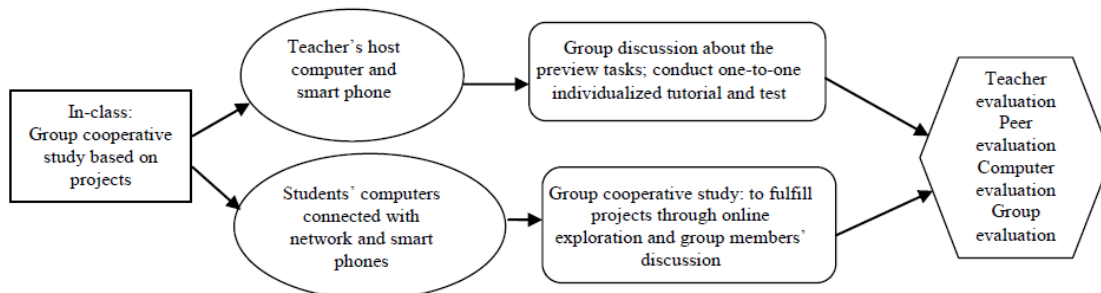


Figure 5: In-class group cooperative study based on projects: devices, activities and evaluations

In-class stage: In this stage, teaching objective stresses online cooperative and discussion learning strategy based on problems and projects among teacher and students. Teachers should guide the students to conduct discussions about the preview questions among each group members and to hold inter-group dialogues about group answers. Here, teacher can use host computer to supervise and guide the group discussions in an efficient and appropriate way, and each student can exchange ideas with his peers and ask for help from teachers simultaneously. Group discussions can also center around a concrete learning project through online free conversation and common exploration. This is a cooperative learning pattern in which students and teachers are learning partners who are willing to share their opinions and resolutions with others. The whole teaching and learning process progress smoothly under the support of network, and the evaluation task is fulfilled by four elements: teacher, peers, computer and group in order to guarantee the completeness and accuracy.

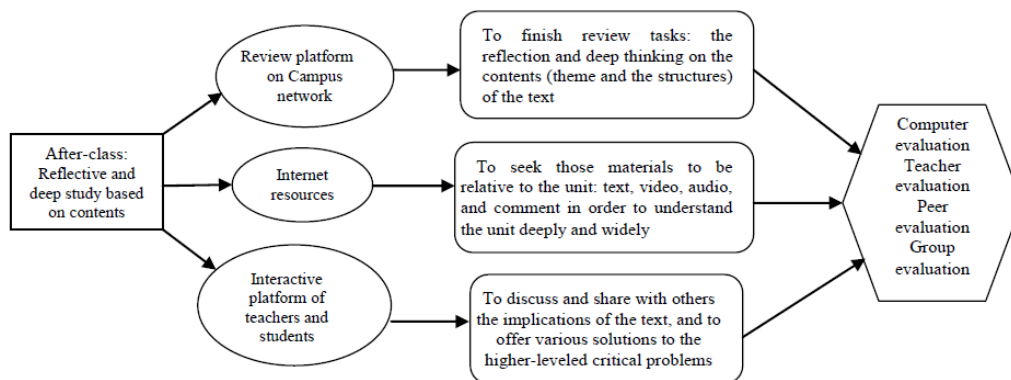


Figure 6: After-class reflective and deep study based on contents: devices, tasks and evaluations

After-class stage: In this stage, teaching objective stresses online reflective and deep study based on contents. Teacher and students fully apply review platform and interactive platform to finish not only the review tasks as to the main contents (the theme and main structures) of the text, but also the deeply-hidden implications of the text and also the higher-levelled critical problems in reasoning and analysis. Students seek those learning materials to be relative to the text which help understand the contents deeply including video, audio, lyrics, and book comments. Internet is a huge resources bank from which we can acquire massive knowledge and information to be applied into English learning and critical thinking. The process of reflective and deep study is vital to train the students' individualized and specific thinking abilities.

C. Practical Analysis of Integrated Framework of One-to-one Digital Learning in EFL Teaching (Qu, Shen & Zhang, 2014)

One-to-one teaching is an educational practice to optimize resources and teach students in accordance with their aptitudes in the modern educational society. (Zhang, 2014) One-to-one strategy means that every student owns a set of digital device and enjoys various platforms and resources supplied by that device, so as to learn effectively under the guidance of teachers. One-to-one teaching defines that teachers can provide one-to-one special instruction which gives consideration to not only students' learning traits but also teachers' teaching styles. Teachers can instruct the students with a definite object; students can learn knowledge with high efficiency and good results.

Design for EFL teaching contents: Students' knowledge acquisition should be selected as the core of EFL teaching contents, and meanwhile, students' improvement in foreign language ability and comprehensive cultural attainment to promote professional development should be achieved. In EFL class, teachers can begin the class with showing pictures and playing courseware to introduce the topic for discussion. Then, the students read the articles or essays relative to the topic through EFL websites and various learning devices, doing exercises of listening and reading. The students can also use online dictionary to look for the meanings of those new words and take e-notes. After finishing the preparatory tasks, the students set about understanding the main contents of the text, organizing the clear materials through online collection and self-reflection. Under one-to-one digitalized environment, textbook isn't the only teaching contents, and the students can get teaching and learning resources from multiple channels via self-study and cooperative communication guided by teachers. One-to-one digital EFL encourages students to start research-based study, self-study, and cooperative study. Through the practice, reflection and comprehensive application of various higher-levelled thinking activities, the students' critical thinking and application abilities are improved greatly. The presentation styles of multimodal information contributes to stirring the students' enthusiasm for learning, and inspiring them to ponder over those critical problems and participate into teaching activities. The students reconstruct learned knowledge according to their understanding by means of collection, sorting, analysis, and induction of information.

Enrichment in EFL teaching styles: The adjustment of teaching styles has direct influence on teaching effects. One-to-one digital learning environment fully reflects the collective features of practicability, knowledge and interest, stimulating initiatives from both teachers and students. EFL can be divided into three parts: in-class teaching activities guided by teacher, pre-class learning activities developed by students, and after-class practical activities centred on the new knowledge. As to in-class activities, the main teaching and learning style is group cooperation which trains the students' communicative capabilities and team spirits. This cooperation can promote mutual help and mutual learning, discussing together how to organize those known materials, which enhances the students' logical thinking and judging abilities. One-to-one digital learning environment provides broad platform for pre-class and after-class activities. Students are encouraged to write blog, reflective diary in English, to submit online composition and project paper. Those online discussion, question-answering and inter-communication have become normalized activities applied by teachers and students in their spare time. Both of teaching styles and learning strategies have been radically changed; teaching pays more attention to connect learning courses with learners' real lives, and learners' initiatives for English study make English class filled with the characteristics of individual instruction, mobile learning, and network teaching.

Improvement in EFL teaching evaluation: Teaching evaluation is a vital link in course teaching. Teachers can obtain teaching feedbacks immediately, and then revise teaching plan, supervising teaching progress in this new teaching

environment. Those learning records, personal study logs, teachers and peer review on the information platform can offer reference for adjusting learning strategies, improving learning methods, and enhancing learning efficiency. Teachers can apply the function of online exams to test the students' mastering the new knowledge before the class. According to the test results, teachers can determine their appropriate teaching contents and strategies; students can understand their learning effects and improve learning methods. Teachers and students can make evaluation on assignment, works, and achievement through online polling system or evaluation platform. For instance, teachers apply data regulating system and data processing capacity to make formative evaluation on English writing. Furthermore, teachers can devise more appropriate writing plan for different students through data statistical and analytical function of intelligent evaluation system, making more objective analysis concerning teaching effects.

In fact, one-to-one digital learning environment breaks traditional learning model: leaning is extended in time and space; students are not confined to class learning. Digital evaluation model also breaks the bonds of time, space and territory; the prompt and proper information feedback contributes to knowledge review and consolidation. The students can understand their learning status almost anywhere at any time, and understand others' learning progress and effects through online evaluation. Moreover, peer review and online discussion can lead to mutual learning and evaluation, which enriches students' thinking modes and improve their critical thinking abilities.

IV. CONCLUSIONS

The educational reform that one-to-one digital learning is integrated into EFL teaching may be rated as a great contribution to EFL teaching, which changes the current bottleneck position of EFL reform completely. For a long time, Chinese EFL teaching was in the difficult position, for one thing, most of students kept silence in English class without active thinking and wide participation; for another, most of teachers adopted commonly used teaching methods with simple interpretation and repeated training. It's well-known to us that Chinese students tend not to think in critical manner, but rather, they tend to think in a middle way without direct disagreement or open discussion, which results in the shortage of creative talents with abundant critical thinking abilities. (Wei, 2014) This new combination of technology and education, however, infuses with new ideas and media into EFL teaching. Student becomes teaching subject, and teacher becomes teaching guide. With the help of network platform, students can begin learning according to their own demands to realize self-exploration study and multi-perspective interactive study. Teachers have to attach much importance to their expertise development in English and information technology. Under one-to-one digital EFL learning environment, the main target of learning is to grasp self-study ability, communicative ability, critical thinking ability, and above all, the abilities to resolve professional problems in English. To promote deep integration of information technology into EFL teaching renders assistance in sharing high-quality English resources and constructing creative model for developing English talents.

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REFERENCES

- [1] Qiu Chongguang, Gao Anbang. (2010). New Development of Learning Theory in Network Age: Connectivism. *Journal of Guangdong Broadcasting and TV University*: 19 (3):2-7.
- [2] Qu Xin, Shen Yunhua, Zhang Yanying. (2014). A Study on the One-to-One Mobile Learning of EFL Teaching for the Students' Critical Thinking Development. *China Educational Technology*: (5) 80-84.
- [3] Wei Li. (2014). College English Network Teaching and Learning Model Oriented by Critical Thinking Problems through Community of Practice. *Theories and Practice of Language Studies*: (12) 2485-2491.
- [4] Xu Le, Song Lingqing, Di Miaoci, Gao Ting. (2014). The Areas and Challenges of One-to-One Digital Learning. *China Educational Technology*: (5) 58-63.
- [5] Yu Shenquan, Chen Ling. (2007). Teaching Reform under the Network Teaching Environment in Class. *China Educational Technology*: (11) 25-29.
- [6] Zhang Wei. (2014). New Approach of One-to-One Teaching: The Study of Using iPad as a Teaching Aid for Loud-reading Teaching. *China Educational Technology*: (5) 74-79.
- [7] Zhao Jian. (2005). Learning Community: on the learning's social cultural analysis. Ph. D, doctoral dissertation. East China Normal University.
- [8] Zhou Guomei, Fu Xiaolan. (2002). Distributed cognition: A New Cognitive Viewpoint. *Psychological Science Development*: 10 (2)147-153.



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