The University of Osaka
Institutional Knowledge Archive

Title	Study of Technology-Enhanced Learning Environments in China
Author(s)	張, 海
Citation	大阪大学, 2010, 博士論文
Version Type	
URL	https://hdl.handle.net/11094/57700
rights	
Note	著者からインターネット公開の許諾が得られていないため、論文の要旨のみを公開しています。全文のご利用をご希望の場合は、大阪大学の博士論文についてをご参照ください。

The University of Osaka Institutional Knowledge Archive : OUKA

https://ir.library.osaka-u.ac.jp/

The University of Osaka

【28】

氏　　名	張（チョウ）　海（カイ）
博士の専攻分野の名称	博　士（人間科学）
学　位　記　番　号	第　２３５１８　号
学 位 授 与 年 月 日	平成22年３月23日
学 位 授 与 の 要 件	学位規則第４条第１項該当 人間科学研究科人間科学専攻
学　位　論　文　名	Study of Technology-Enhanced Learning Environments in China （中国における技術を活用した学習環境に関する考察）
論 文 審 査 委 員	（主査） 教　授　前迫　孝憲 （副査） 教　授　井村　　修　　准教授　齋藤　貴浩

論 文 内 容 の 要 旨

As one subfield of Technology-Enhanced Learning, Information and Communication Technologies (ICT) use for learning has been gaining increasing attention in recent years. Although the validity and effectiveness of general ICT use has been studied by researchers around the world, previous methodological approaches can be criticized for considering data out of context without regard for several key factors that can affect study results. One such factor is social interaction, which has been taken for granted, yet will automatically occur in most Technology-Enhanced Learning Environments (TELE). Little information has been provided in these studies about the contexts and complexities of other key environmental factors such as activities, roles, and relations that characterize and differentiate specific processes of interaction between the environment and people (Bronfenbrenner, 1979, Kirshner, 2005, Engeström, 2009).

In this thesis, Technology-Enhanced Learning in the context of technological, societal, and cultural transformation is examined by focusing on ICT-Enhanced Learning Environments in China. The transition of TELE's in rapidly growing China from 1985 to 2005 provide a unique scientific opportunity to observe changes that would normally take many years to occur in a relatively short period of time. The study results also could prove beneficial for developing countries looking to use ICT to enhance their educational systems.

A development-oriented approach was used, which is also referred to as a systematic historical-cultural approach in this paper. Through this approach, the activities, roles, interactions and knowledge construction were analyzed as educational environments changed. The author of this paper has wide-ranging and in-depth experience in ICT use in education including policy making, university education, formal education, and informal learning. He participated in many large-scale experiments in elementary schools, submitted reports to the central government, and conducted research for three universities in the course of this study.

In the Introduction, issues with existing research on ICT use in education and the development of the improved methodology used for this research are explained. Also, the structure of thesis is outlined.

In Chapter 1, basic concepts and methodologies related to the study of TELE's are described. Due to the complexities of educational environments, an ecological theoretical framework and a systematic historical-cultural approach were chosen for this research. A context-aware descriptive framework was employed with the goal of spreading local tacit knowledge from the schools studied to other schools all over China.

In Chapter 2, a review of policy papers published and distributed by the Ministry of Education of China and other related essays, reports and white papers is conducted. A chronological record of the transition to TELE's is given. Core organizations and major projects are identified. A cultural and systematic analysis of the roles of the core organization, listed as the "Central Educational Technology Center (CETC)" in this thesis, in implementing a major national project, the Modern Distance Education Project for Rural Schools (2004-2007) which was funded for more than 9 billion yuan, is detailed. The functions of the CETC with regards to the varying infrastructural and environmental conditions across China are discussed. The organizational structure and roles of national institutions in infrastructure and digital resource development and distribution for TELE's in China are explored.

In Chapter 3, a meta-analysis of academic papers published in academic journals in China is conducted. Universities' roles in human development and the promotion of TELE's along with the paradigm shift of studies of educational technology in China are examined.

In Chapter 4, a large-scale project implementing TELE's in primary schools is reported in detail, describing and interpreting the roles, interactions and changes of practitioners as they enter new TELE's. Comparative analysis of test results of 5442 students shows that the achievement scores of the experimental group (3048 students) was 70.5±15.6, which is significantly higher than that of the control group (2394 students) (59.2±16.9). The reflections and teaching plans of teachers participating in the project are analyzed to determine how TELE's affected them. The results show that design of a Teacher-guided Learner-centered Learning instructional structure is iteratively developed and widely employed with the goal of supporting self-guided learning by children in a classroom which helps to improve student achievement. The findings from qualitative data also show that custom resource building, personalization of instructional models for teachers, and adjustment of school management models are particularly important. The results show that sustainable implementations of TELE's cause teachers to become more research-oriented and the organizational structures of schools tend to change.

Chapter 5 presents an experimental study of computers supporting collaborative learning conducted at a conference in 2007. Main attendees are bloggers and the others are reporters and journalists. Attendees listening to live audio casting of the conference proceedings were able to send messages to a large screen in the conference hall visible to participants watching live presentations. Message sizes were limited to 200 characters and the main display screen only showed 3 messages at a time, refreshing with new messages every 2 seconds. Filtering was used to prevent the posting of derogatory language. People could participate in this messaging system with 7 different kinds of instant messages tools including Google Talk, MSN Messenger, QQ, Skype, standard web browsers, and the SMS/WAP features of Chinese cell phone service providers. During the course of the 2-day conference, 3506 messages were contributed online. This study demonstrated how the availability of a ubiquitous network in a learning environment can facilitate communication among participants. Further analysis of the factors that contribute to effective communication in ubiquitous network systems like this could prove effective for other TELE's .

In this study, the cultural environment of Technology-Enhanced Learning and two experimental studies in China are introduced and features of TELE's were explored. This thesis provides a systematic historical-cultural framework for context-appropriate research that takes into account the dynamic and diverse cultural elements of learning environments. The results of the two experimental studies in introduced in this thesis provide a set of practical methods to examine elements and interactions, which include activities, roles and knowledge building, in learning environments have the potential to be widely applied in the field of education.

論文審査の結果の要旨

本論文は、中国における「技術を活用した学習環境」に関する一連の研究をまとめたものである。そして、中国における TEL(Technology-Enhanced Learning)のための社会基盤や理論的背景、人材育成の仕組みや教室／シンポジウム会場

等における実験的取組、モデル構築の試行などについて記述された5章から構成されている。

今世紀になって10年間に中国の大学では教育技術学部が急速に立ち上がり、全ての師範大学約100校のみならず、全国220大学に設置されてきた状況や、教室等でICTを活用する際に必要となるデジタル教材等リソース作成やインターネット等基盤整備を行う仕組みが、教育省中央電化教育館を中心に、各省市町村レベルまでトップダウンに構築されてきた様子を述べている。さらに、日々の授業に遠隔学習等ICTを活用する実験的取組「カエル跳び」プロジェクト（全国145校を10チームに分割）では、2003〜6年に大連地区5校および広州地区12校から構成されたチームのリーダを務め、小学校1年国語の授業でICTを活用した実験群3048名の成績が平均70.5点と、対照群2394名の59.2点に比して有意に高いという成果を得ており、その理由の分析を、独自開発した授業カテゴリー化等で試み、教育方法が教師中心から学習者主導へと変化したこと等を明らかにしている。これらの手法や成果は、その意味するところが本質的であるために、教育工学や教育方法学、特に我が国の教育へのテクノロジー活用分野の研究に長期間、影響を与え続けると考える。

以上の理由から、本論文は、博士（人間科学）学位論文として十分に価値あるものと判定した。