A Review of Recent Research on the Impact of Information Communication Technologies and Their Convergence on Second Language Acquisition

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Abstract – **Information Communication Technologies and their critical convergence are radically impacting human consciousness, society, and the habitable environment. The effects on the field of Second Language Acquisition are of significance, particularly the impact on EFL/ESL pedagogy in East Asia. I review my recent research concerning these effects in order to make the research more accessible; to help identify general themes that drive this body of research; and to aid integration of these various facets into a comprehensive structure intended to advance the research and raise implications for future enquiry.**

Index Terms – L2 Digital Literacy, EFL/ESL, Convergence, ICT, Second Language Acquisition.

I. INTRODUCTION

These thirty-two papers from 2006 onwards have been published at ICT conferences organized by SERSC, AICIT, ICHIT and/or in related journals; at linguistics conferences SICOLI, KAMALL-APAMALL, KATE, ALAK; and at World Congresses on Asian Studies. They are available online from the publishers, and my homepage above. Inevitably there is overlap and repetition, so here the papers are organized into thematic clusters. Variations of similar ideas occur as a consequence of my presenting research work to a wide range of audiences, while developing diverse aspects of the research differentiates papers within a cluster. This review seeks to counterbalance that broadness in presentation and to eliminate redundancy by combining related papers into summary form.

II. THE PAPERS

A. English as a Celestial Language

From the emergence of English as a Global Language, Paper [1] asserts eventual intensive exploration and settlement of Space will make use of English as a Celestial Language. What forces will likely shape the structural features of English as it expands into the Cosmos? Microgravity, artificial intelligence, isolation, confinement, and the silence of Space will transform this language's structural features.

B. Spatial Play in Language Acquisition

Spatial play is of vital importance to diverse disciplines concerned with developing spatial intelligence, and awareness of the formal languages used to address space. While spatial language ability is a critical aspect of spatial intelligence and play, little research attention has been paid towards its First Language (L1) or Second Language (L2) acquisition in such contexts. Papers [2] and [3] review the research literature, identify a significant shortfall, and suggest avenues for further research. The nature of spatial play should be clarified, and its role in facilitating language acquisition addressed. Multi-sensory spatial play helps experiential and linguistic learning, and language acquisition should relate to existent spatial language ability. Discovery during spatial play may helpfully destabilize spatial interlanguage, inhibit fossilization, and allow development. Collaborative spatial play stimulates spatial language play and thus language acquisition. Design philosophy may benefit spatial language acquisition theory.

C. Cell Phones in the L2 Classroom

The traditional SLA classroom has been radically redefined by the advent of virtual learning communities. Computer-mediated language learning has become significant, and increased use is being made of wireless networked mobile computers to facilitate internet-based language learning. Meanwhile, cell phones are becoming ubiquitous. Students presume their right to personal use during class, frustrating teachers who regard this as disruptive.

However, Papers [4] and [5] argue that cell phones in class provide potential for ubiquitous computer-mediated Second Language Acquisition (SLA). Existing research provides a general orientation and conceptual framework, and identifies their relevance to task-based learning, potential for distributed practice, and suitability for encouraging classroom interactivity. An important usage of cell phones in the L2 classroom is capturing SMS into a database that is displayed on a message board. Teachers can use computers to send SMS to students, with particular advantages for administrative purposes. The challenge is to ensure that permitting cell phone use in class does not open a Pandora's box.

D. Online Learning Strategies of Second Language Students

Despite Oxford's pioneering realization of the importance of language learning strategies to language learning, little research attention has been paid to the strategies actually used in accessing online resources. Theoretical publications have suggested that significant qualitative differences exist between traditional, and online, learners and learning. Following an earlier literature review, Papers [6] and [7] identify the potential for empirical research into online language learning strategies that are used by students to complement traditional

L2 learning. A research proposal subjects the theoretical schema previously discussed to empirical research of the kind previously reviewed, which would conduct think-aloud protocols together with interviews and subsequent analysis. The research exploits the computer-based Internet environment, addressing various specific research questions.

E. The Hierarchy Revisioned

The modern Western *Weltanschauung,* affirming an empirical view of the world, tends towards a singular analysis of complexity. Compartmentalization and dissociation are emphasized, and reinforced by the structure of the Simple Hierarchy that the *Weltanschauung* promotes. Within human institutions, this structure characteristically gives rise to unsatisfactory political environments. But the network which is advocated as an alternative appears severely limited in its capacity to structure complexity, and may be indicative of a loss of sense of qualitative structure to the world.

Paper [8] presents a critique of the Simple Hierarchy. The potential of hierarchical structures is discussed, with reference to the Traditional perspective. A revised appreciation of the hierarchy indicates its potential for human development, in concert with the network. Problems stem not from the hierarchical structure *per se,* but from the specific types of hierarchy used, and how these are understood and applied.

F. On the Obliquity of Ubiquity

Ubiquitous computing offers exciting potential, and will likely extend to more comprehensive ubiquitous service, as demand grows for the ability to access desired services anywhere, any time. However, these are not new notions, and related visionary proposals were put forward in the 1960s. The etymology of *ubiquity* derives from a metaphysical premise of the spatial and temporal omnipresence of the divine, and the notion extends through traditional religious thought far back into prehistoric belief. While ubiquity is clearly a highly desirable notion, it bears the danger of becoming an overly indulgent wish fulfillment, where all human needs and desires demand immediate satisfaction. Clearly, this represents an unhealthy extension of the idea. Paper [9] argues that what is called for instead is Wisdom Ubiquity: the wise provisioning of ubiquitous services, which within realistic parameters accommodate an appropriate level of human satisfaction.

G. Metaphysics and Multimedia

The effects of multimedia on users are profound, affecting their relation to physical reality and metaphysical perspective. Within the electronic environment, the multimedia user experiences a spatio-temporal freedom from certain important physical constraints of the real world. Electronic configurations are free from constructional, material, structural or gravitational constraints operating in the physical world. This freedom is liberating: the imagination is given a powerful tool with which to explore externalized representations of ideal environments. But a potentially destructive potential arises. External tools of the imagination become increasingly sophisticated at the expense of the ability to master the internal imagination. Paper [10] argues that we externalize at the price of inner vision. There is a possibility of greater alienation from the physical world and from the spatial and structural intuition with which we inhabit reality. A loss of these critical relationships to physical reality may mean we encounter a loss of metaphysical lucidity to the world.

H. Surveys of the Use of Digital Devices & Online Resources

Cell phones and SMS offer an immediately available form of ubiquitous computing in the classroom to facilitate second language acquisition. Paper [11] presents the results of a preliminary survey of student use of cell phones, electronic dictionaries, SMS, Email, Computers and the Internet, investigating use of the target L2 English, questioning whether such resources were used for L2 learning, and to what extent the target L2 was used. The survey was refined and repeated in the following semester, the results of which are presented in Paper [12], together with suggestions for future improvement.

I. Korean Face and Cultural Dimensions

Kohls' popular guide to living and working in Korea presents Koreans as being people-oriented and group-centered. Paper [13] presents a critical review from a perspective of intercultural communication, with regard to face and cultural dimensions. Kohls critically identifies face as a key concept to understanding Korean society, but does not distinguish negative and positive face, nor identify face-work strategies that might help the reader save or give face. Korean society is high-context, with high degrees of collectivism, power-distance and uncertainty avoidance, with long-term orientation and an interdependent construal of self. Although Kohls does discuss *kibun,* indirectness and harmony, he does not identify Korea as exhibiting a high-context culture and communicative style in comparison with low-context American society. He also fails to identify another key Korean-American cultural differential, that of large versus small power-distance.

J. Making Videos to Post on an L2 Social Networking Site

In East Asia, the high penetration of student cell phones, with built-in features that include bilingual dictionaries, SMS, Email, Internet access and videocams, already offers ubiquitous computing facilities for pedagogical applications. Papers [14], [15] and [16] describe an EFL task that required college freshmen to make L2 English video guides to their campus on their cell phone videocams. Videos were emailed to the instructor, and after file conversion, uploaded to a vblog on US.Cyworld.com, an English language social networking site. Students were instructed by email to view the videos there, and to post responses in the homepage guestbook. This required the use of English to set up a personal account and to navigate the social networking site, and to compose and post responses. The task identifies the developing critical importance of L2 Digital Literacy within EFL pedagogy.

K. Are English Prepositions Simply Degenerate Verbs?

Prepositions share properties with verbs: they act as operators that often relate subject and object noun phrases, and they assign theta roles and case to their nominal objects. Paper [17] explores syntactic parallels in the English language between verbs and prepositions, while noting significant areas where they differ. Mathematical degeneracy denotes a limiting

case in which a class of objects changes its nature to become simpler. Degenerate structure is discussed, using two-dimensional geometrical examples, and ways are identified in which degeneracy gradience might be applied to lexical categorization. The syntactic role of prepositions is examined. Prepositions and verbs are compared, to identify significant similarities and critical differences. The treatments of prepositions in Chomsky's and Jackendoff's competing theories of syntactic feature sets are reviewed. The syntactic evidence indicates English prepositions could be subsumed as a degenerate form of verbs. This has potential implications for computational linguistics and artificial intelligence.

L. Using LMS to Develop Critical L2 Digital Literacy

L2 Digital Literacy is of emerging importance within EFL in Korea, and will evolve to eventually be regarded as the most critical component of overall L2 English Literacy. Computer-based Internet-hosted Learning Management Systems (LMS), such as the popular open-source Moodle, are rapidly being adopted worldwide for distance education, and are being applied to blended/hybrid education. Papers [18], [19] and [20] argue that they have a special potential in EFL Education: by setting the LMS to force English to be used exclusively throughout a course website, the meta-language is made the target L2 language. Students of necessity develop the ability to use English to navigate the Internet, access and contribute to online resources, and engage in computer-mediated communication. Students develop their L2 Digital Literacy through such pragmatic engagement with English.

M. The Korean Need for L2 Digital Literacy in English

While digital resources play an increasing role in SLA, Korean learners of English are provided with little intentional instruction in L2 Digital Literacy. But the predominant use of English by non-native speakers is increasingly in communication with other non-native speakers, not native speakers; the emergence of English as a global language has meant that desired online resources and discourse are mainly in English; and a critical threshold is fast approaching whereby the majority of interpersonal communications will have become computer-mediated, rather than face-to-face.

Papers [21] and [22] address literacy, digital literacy and L2 digital literacy. Together with Paper [23], they argue that the predominant use of English by non-native speakers will be firstly in navigating English language digital resources, in locating, editing, and contributing to online content in English; and secondly in computer-mediated communication with other non-native speakers of English. Both of these envisaged predominant uses of English by non-native speakers are computer-mediated. This has profound implications for SLA, and specifically for Korean learners of English: in EFL we should nurture and develop L2 Digital Literacy in English.

N. Computerization of the p&p Oxford Quick Placement Test

Sorting of EFL students by L2 aptitude typically allocates students to classes of compatible ability level, and was here used to screen candidates for interview. Paper-and-pen versions of the Oxford Quick Placement Test were adapted to computer-based testing via online hosting using FSCreations ExamView. Hosting problems led to conversion to the popular computer-based LMS Moodle. 317 sophomores were tested online to encourage L2 digital literacy. Papers [24] and [25] argue that such computer-based Internet-hosted L2 aptitude tests prove effective strategies for hybrid implementation of LMS in L2 tertiary education. These provide a convenient measure of student progress in developing L2 fluency, and offer a more objective and relevant means of teacher- and course-assessment than student evaluations, which often tend to confuse entertainment value and teacher popularity with authentic academic credibility and pedagogical effectiveness.

O. The 3:5:4 Initiative to Refocus Tertiary EFL Resources

Asian societies recognize the importance of English as a Global Language, and place considerable emphasis on raising the level of English ability. Tertiary students are required to study EFL, but critical real-world constraints emerge: significant numbers of Korean Learners of English are unmotivated and/or have low aptitude; and there are limited resources with which to teach English. As an alternative to addressing the political dimension, which means simply prove ineffectual, Paper [26] advances the 3:5:4 Initiative to provide for a more effective use of resources. The level of English in Asian societies could be raised through improving educational output. Qualitative and then quantitative restructurings of relative resource deployment are made. The need for such optimization is evident as the global economy suffers a serious period of recession, while the quality of English demanded from graduates rises. A straightforward mathematical model is developed from first principles of the relative proportioning of deployment of resources. The efficacy of resource deployment under two alternative scenarios indicates significant potential gains in efficiency in educational value.

P. EFL/ESL Textbook Selection in East Asia

EFL/ESL departments regularly need to select textbooks. Non-native speakers use L2 English mainly to communicate with other non-native English speakers, so an American accent is less important. L2 English will mainly be used in computer-mediated communication, hence the importance of L2 Digital Literacy. The convergence of ICT is radically impacting SLA, which is integrating web-hosted Assessment and LMS. EFL/ESL textbooks need to be compatible with blended learning, prepare students for a globalized world, and foster autonomous learning. Paper [27] reviews research on EFL/ESL textbook evaluation, and includes relevant material for adaptation. Textbooks are major sources of contact with the target language, so selection is an important decision. Educators need to be systematic and objective in their approach, and adopt a selection process that is open, transparent, accountable, participatory, informed and rigorous.

Q. The iPad as a Tool for Developing EFL Digital Literacy

In future, the uses of English by non-native speakers will predominantly be online, firstly in using English language digital resources, and secondly in computer-mediated communication with other non-native speakers of English. That both of these uses are computer-mediated has profound implications for Korean learners of English. For Korea to be

competitive in the global economy, its EFL should develop L2 Digital Literacy in English. But how best to achieve this?

With its fast Internet connections, Korea is arguably the most wired nation on Earth; but ICT facilities in educational institutions need drastic reorganization. Opportunities for computer-mediated second language learning need to be vastly increased, particularly for native teacher English classes. Papers [28], [29], [30] and [31] argue that multimedia capable, mobile web solutions need to be provided that put the Internet firmly into the hands of all students and teachers. Wi-Fi networked campuses already allow any campus space to act as a wireless classroom. A teacher's computer console with high-speed Internet access and OHP is required in every classroom. All students should be provided with adequate computing facilities, that are available anywhere, anytime; this has now become feasible through providing every student on enrollment with a Wi-Fi+3G enabled Apple iPad.

R. The EFL/ESL Textbook Dematerialized and Deformalized

Rapid development and critical convergence of ICT is radically impacting education, particularly in SLA, where the sudden availability of multimedia content and immediacy of distance communication offer specific advantage for interactive participation. The language classroom is evolving to integrate computer-mediated learning and communication with traditional schooling; digitization and the Internet mean the textbook is evolving from inert hard copy that is consumed, to dynamic e-texts that students participate in. The emergence of English as a Global Language, with the primary role of English on the Internet, means that the transition from fixed hard copy to fluid online digital environment is particularly evident in EFL/ESL. Paper [32] reviews research, traces this transition, and speculates on how, under the impact of ICTs and their convergence, the EFL/ESL textbook will reform, and may even disappear as a stand-alone entity.

III. CONCLUSION

Transformations in second language acquisition through the impact of ICT and their convergence indicate EFL/ESL should develop L2 digital literacy; favor blended learning, LMS and e-texts; and offer ubiquitous Wi-Fi tablet computing.

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