

Systematic Reivew of CALL Research



Plan

- A Brief History of CALL
- New Technologies in English as a Foreign Language: A Systematic Review

A BRIEF HISTORY OF CALL

A Brief History of Computer-Assisted Language Learning (CALL)

- 1950s – 1970s: Behaviouristic CALL
 - 1970s – 1980s: Communicative CALL
 - 1990s onwards: Integrative CALL
- (Warschauer, 1996)
- For a critique and alternative classification see Bax (2003)

1950s-1970s: Behaviouristic CALL

- Applications:
 - Drill and practice (aka. "drill and kill")
 - Programmed instruction (Skinner 1958; Beatty, 2003)



Programmed Instruction

A set of frames to teach the spelling of 'manufacture' to third-graders.

Frame 1. Manufacture means to make or build. Chair factories manufacture chairs. Copy the word here: _____

1. Part of the word is like part of the word factory. Both parts come from an old word meaning make or build.
m a n u _____ u r e
2. Part of the word is like a part of the word manual. Both parts come from an old word for hand. Many things used to be made by hand. _____ f a c t u r e
3. The same letter goes in both spaces: m _ n u f _ c t u r e
4. The same letter goes in both spaces: m a n _ f a c t _ r e
5. Chair factories _____ chairs.

(Skinner, 1958: 969-77; Beatty, 2003: 87)

Systematic Reivew of CALL Research

1950s-1970s: Behaviouristic CALL

- **The Stanford Project**
 - Self-instructional, exploited the branching power of the computer to deliver programmed instruction
- **The PLATO System**
 - System for the delivery of computer-based training in any discipline.
 - Curtin et al.'s (1972) implementation of the system for language learning integrated a 'Sentence Judger' program for the automatic assessment of students' translations.
- **The Dartmouth Project**
 - BASIC programming language, spell checker, randomization of questions

(Ahmad et al., 1985)

1950s-1970s: Behaviouristic CALL

- **The Scientific Language Project**
 - Focused on the vocabulary needs of science students reading in a foreign language – high frequency words were taught through context-free drills, with the remainder of vocabulary taught in context
- **The TICCAT Project**
 - First multimedia CALL system
 - The design of the system was based on a specific theory of learning, namely Component Display Theory

(Ahmad et al., 1985)

1970s-1980s: Communicative CALL

Text reconstruction: Text Unscrambling



Side by Side Interactive
From Pearson Education

1970s-1980s: Communicative CALL

Text reconstruction: Storyboard (Levy, 1997: 24)



Fun With Texts
From Camsoft

1970s-1980s: Communicative CALL

Simulations



Yellow River Kingdom
<http://www.youtube.com/watch?v=ee9G7r3G4M>
(Seedhouse, 1995)

1970s-1980s: Communicative CALL

Simulations



A La Rencontre de Philippe
The ALLP Project

Systematic Reivew of CALL Research

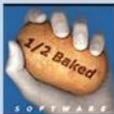
1970s-1980s: Other Developments

Authoring

- Launch of the BASIC programming language
→ Birth of the teacher-programmer

• Authoring tools

- **Hot Potatoes** (<http://www.halfbakedsoftware.com/>)
 - Multiple-choice questions (JQuiz)
 - Gap-fill exercises (JCloze)
 - Crosswords (JCross)
 - Jumbled sentences/words (JMix)
 - Ordering exercises (JMatch)
 - Matching exercises (JMatch)



1990s onwards: Integrative CALL

- Applications
 - Web Quests (Dodge, 1995)
 - Task-based learning



Web Quest

http://www2.warwick.ac.uk/fac/soc/di/postgrad/ma/elt_mm/odu/rsedes/webquest/

1990s onwards: Integrative CALL

- International Email Tandem Network
- Computer-Aided Multimedia Interactive Learning (CAMILLE)
- The Oral Language Archive

(Levy, 1997)

The Future of CALL

- Levy (2009) draws our attention to three new areas of CALL research
 - **Speech-enabled CALL**
(Special issue CALICO 1999; Holland and Fischer, 2008)
 - **Mobile CALL (MALL)**
(Special issue ReCALL 2008)
 - CALL 2.0
- Another established field of CALL Levy mentions is:
 - **Intelligent CALL (ICALL)**, also known as parser-based CALL
(Heft and Schutze, 2007)

NEW TECHNOLOGIES IN EFL A SYSTEMATIC REVIEW

Discussion Questions

Another characteristic of a systematic review is that requires engagement with the users of the review.

- What characterises good use of technology in language learning?
- Which applications "add value"?
- How can we convince teachers of the value of using technology in language learning?
- What are teachers looking for from evaluations of the use of technology in language learning?

Systematic Review of CALL Research

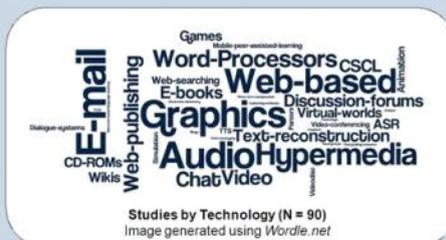
Systematic Map: Results

- 90 papers were identified which met the inclusion criteria
- In the majority of these papers English was the TL (72%), and, in 29% the TL was a European language

Studies by Language Area and Skill (N = 90)

Language skills/areas	Primary	Secondary	Total
Vocabulary	10	14	24
Grammar	2	6	8
Pronunciation	3	0	3
Reading	12	9	21
Writing	5	16	21
Speaking	2	3	5
Listening	4	1	5
Other	14	23	37
Not indicated	0	4	4
Total	39	51	90

Systematic Map: Results



In-Depth Review: Results

- 33 papers were identified which met the inclusion criteria

Studies by Language Area and Skill (N = 33)

Language skills/areas	Primary	Secondary	Total
Vocabulary	5	6	11
Grammar	0	3	3
Pronunciation	3	0	3
Reading	7	5	12
Writing	3	8	11
Speaking	1	1	2
Listening	2	0	2
Total	15	18	33

Systematic Map: Results



Internet: Web Publishing

- Parks et al. (2005)
 - Technology and instruction
 - Collaborative web site creation projects
 - Process writing instruction
 - Method
 - Canadian high school students grades 7 through 10
 - Students' appropriation of process writing
 - Results
 - Students gradually appropriated the writing process
 - They understood the process, used it, and began to transfer it to other classes because they found it useful.
 - Implications
 - To get this result, teachers have to persist

Computer-Mediated Communication (CMC)

- Computer-Mediated Communication
 - "Any program that allows learners to exchange language – through text or audio." (Blake, 2008: 152)
 - E-mail
 - Discussion forums
 - Chat
 - Synchronous/Asynchronous
 - One-to-one/One-to-many
 - Text/Voice

Systematic Reivew of CALL Research

CMC: Discussion Forums

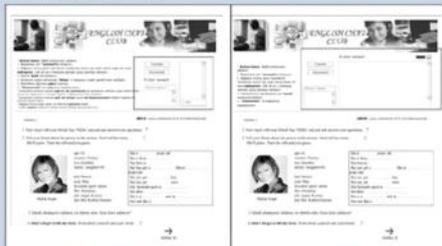
- Chandrasegaran and Kong (2006)
 - Technology
 - Discussion forums
 - Teacher-set topics: "Which fighter plane", "Singapore Idol", etc.
 - Method
 - 15 yr olds at a secondary school in Singapore
 - 190 postings selected by the teacher were analysed for features of expository writing
 - Stance-taking
 - Stance-support
 - Results
 - 33 postings contained personal attacks and were discarded
 - 137 (86%) posts contained stance (total 159 postings)
 - 75 (55%) expressed stance-support (total 137 postings)
 - 120 support moves were identified: personal opinion (33%), fact (27%), hypothesizing outcomes (8%) anticipating opposing views (6%)
 - Students showed less evidence of being able to support stance; this may have been due to the fact that they were not interested in the topic

CMC: Chat

- Satar and Ozdener (2008)
 - Technology and instruction
 - Text and voice chat
 - Homework activities: Information gap, problem solving, jigsaw, and decision making
 - Design
 - 16 – 17 yr olds at a vocational high school in Turkey
 - IVs: (1) Text chat, (2) voice chat, and (3) control (no homework)
 - DVs: (1) Speaking proficiency, and (2) foreign language learning anxiety
 - Results
 - Both text and voice chat can improve students' speaking skills
 - Text chat can decrease students' foreign language learning anxiety

CMC: Chat

- Satar and Ozdener (2008)



Text Chat

Voice Chat

Mobile CALL: Text messaging

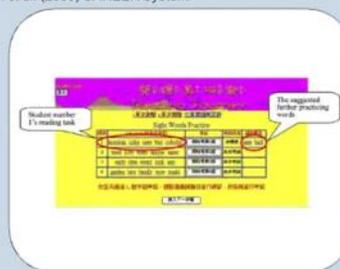
- Lu (2008)
 - Compared (1) bite-sized text message lessons spaced through the day with (2) pen-and-paper instruction, i.e. list presentation
 - In the text message condition, students received four text message lessons per day, two during each of their commutes
 - Those who received text messages improved more, but this advantage was not retained at post-test
 - Students appreciated the bite-sized lessons
 - Students employed positive learning strategies – one constructed here own sentences and sent them back for feedback
 - The games available on mobile phones may distract students from lessons

Mobile CALL: Mobile Peer-Assisted Learning

- Lan et al. (2009):
 - Technology and instruction
 - Computer-Assisted Reciprocal Early English Reading (CAREER) system
 - Learn a personalised list of words and a phonetic rule. Read a paragraph of text. Collaborate to reconstruct the whole text. Practise reading for inter-group competition; Collaborate to answer comprehension questions
 - Method
 - 3rd grade Taiwanese students (primary)
 - IVs: CAREER vs. group work
 - DVs: (1) Oral reading fluency, (2) Retell fluency, and (3) Behaviours
 - Results:
 - Oral reading fluency: Both groups improved and there was no difference between the two groups
 - Retell fluency: Both groups improved, but the CAREER group improved more
 - Behaviours: Students who used the CAREER system collaborated more effectively. Students in the control group failed to cooperate, were more teacher dependent, were not good at peer-assessment and spent more time in learning-unrelated behaviours

Mobile CALL: Mobile Peer-Assisted Learning

- Lan et al. (2009) CAREER System



Systematic Review of CALL Research

Mobile CALL: Mobile Peer-Assisted Learning

- Lan et al. (2009) CAREER System



Speech Technology: Automatic Speech Recognition (ASR)

- Lai et al. (2009) Multimedia English Learning (MEL) System



Speech Technology: ASR

- Lai et al. (2009)
 - Technology
 - Based on mastery learning; task to imitate pronunciation models
 - Modified input: System segments input into individual phonemes
 - Feedback:
 - (1) waveform display, (2) pitch contour, (3) duration bar graphs, (4) volume display
 - If the student does not reach the criterion level of 60% match for a segment it will be highlighted in the feedback
 - Video capture of student
 - Method
 - 3rd grade (9 – 10 yr olds) Taiwanese students
 - IV: Traditional vs. Traditional + MEL System
 - DVs: (1) Phonemic awareness, and (2) Language achievement (spelling and reading isolated words)
 - Results
 - The group that used the MEL system performed better at post-test on both tests

Web 2.0: Wikis



Web 2.0: Wikis



Web 2.0: Wikis



Systematic Review of CALL Research



Web 2.0: Wikis

- Mak and Coniam (2008)
 - Technology and instruction
 - Wiki as a collaborative writing platform
 - 6 week project on the students' new school, with each group of students working on a different topic
 - Method
 - 7th year students at a secondary school in Hong Kong
 - DVs: (1) Amount of writing produced, and (2) Writing processes engaged in (adding, expanding, reorganising and correcting ideas)
 - Results
 - Began by generally discussing the topic and adding their comments to the wiki
 - At the start, students simply added to existing task
 - Over time, they began to edit each others task
 - And eventually, wrote more collaboratively
 - Contributions got longer over the duration of the project
 - Not pattern emerged with respect to error rate
 - Produced more writing than they were normally expected to

Web 2.0: Wikis

- Mak and Coniam (2008)
 - Diagram illustrating the interaction between 'Upper section' and 'Lower section' of a wiki page.
 - Upper section:** Contains a notification message: 'Spicyfa.phoWiki.com was just edited'. Below it, text reads: 'The changed portions of the page follow, with [red] indicating removed text and [green] indicating added text.' This section is associated with 'Author' and 'Notifications message'.
 - Lower section:** Contains a student's contribution: 'When we have a lesson, we always laugh, I think it is very happy. Because when we study in Primary school, the teachers never tell us jobs, and I feel that it is so boring. But I think Secondary school is better than the Primary. Also we can't study with our best friends, I feel sad. So we should make friends to the other people. I can study in Shatin Pui Ying Secondary School, I am very happy. Because the teachers are very kind, friendly, and so on.' This section is associated with 'Work by other students' and 'Wiki adds for comments'.

Web 2.0: Wikis

- Mak and Coniam (2008)
 - Diagram illustrating the interaction between 'Upper section' and 'Lower section' of a wiki page.
 - Upper section:** Contains a notification message: 'Spicyfa.phoWiki.com was just edited'. Below it, text reads: 'The changed portions of the page follow, with [red] indicating removed text and [green] indicating added text.' This section is associated with 'Author' and 'Notifications message'.
 - Lower section:** Contains a student's contribution: 'I think secondary school is free. I am enjoy secondary school life. I think I will be happy to secondary school. I think secondary school is free. I am enjoy secondary school life. I like secondary school because I have more friends than primary school. My friends come in my class or another class. I feel happy in secondary school. I like secondary school because I have more friends than primary school. My friends come in my class or another class. I think I like happy in secondary school. On every Friday, we have a meeting for some form our student. In the meeting, we can sing, have lunch with the friends or talk with the another student. It's very happy.' This section is associated with 'Teacher's input', 'Jane edits another student's work', and 'Early work by another student'.

Web 2.0: Wikis

- Lund (2008)
 - Technology and instruction
 - Use MediaWiki (<http://www.mediawiki.org/wiki/MediaWiki>) to produce a collective project entitled 'Our USA'
 - Completely open task in terms of content and form
 - Students should exploit the affordances of the wiki
 - Method
 - 17 year old senior high school students in Norway
 - Longitudinal interventionist (design-based) study of collective cognition
 - 8 lessons, over 2 weeks
 - Results
 - Learners first developed topics in a self-contained autonomous mode
 - They then branched out to greater independence with other learners
 - Finally, they began to exploit the wiki to engage in a 'collective Zone of Proximal Development (ZPD)'

Systematic Reivew of CALL Research

Virtual Worlds

- Zheng et al (2009)
 - Technology and instruction
 - Quest Atlantis (<http://QuestAtlantis.org>), a 3D game-like virtual world developed using Active Worlds
 - Incorporates CMC (chat, bulletin boards, telegrams and e-mail), 3D avatars and 2D web page navigation tools
 - Allows students to travel to virtual lands where they can engage in quests (context, goals, resources) communicate with other users and mentors and build virtual personae
 - Game-like activities for children with a mythological back story and a point rewarding system
 - Method
 - 7th grade students in a middle school in mainland China
 - IVs: Question Atlantis vs. no additional teaching
 - 60 mins per week for 25 weeks
 - Synchronous communication with Australian partners
 - DVs: Patterns of: (1) language use, (2) media use, (3) engagement in QA activities, (4) engagement in quests

Virtual Worlds

- Zheng et al. (2009)



Virtual Worlds

- Zheng et al (2009)
 - Results
 - Co-questing with Australian partners was not possible due to timetabling
 - Chinese students saw the activities as academic work and took more seriously than the Australian students who 'played' in Quest Atlantis in an after school club; The Chinese students complained that the Australian students did not complete their part of the activities
 - Topics in chat were limited to greetings and everyday school topics
 - 72% of the Chinese students engaged in QA at home
 - 59% of these engaged in single quests (Quest Atlantis Mission, Who am I?, All about Friends)
 - Only 9 out of the 31 pairs of questers completed the co-quest (Becoming an E-pal – joint PowerPoint about oneanother)

Discussion Questions

Another characteristic of a systematic review is that requires engagement with the users of the review.

- What characterises good use of technology in language learning?
- Which applications "add value"?
- How can we convince teachers of the value of using technology in language learning?
- What are teachers looking for from evaluations of the use of technology in language learning?