Systematic Review 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 Box (2003)

1950s-1970s: Behaviouristic CALL

- Applications:
  - Drill and practice (aka "drill and kill")
  - Programmed instruction (Skinner 1956; 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_-
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_a_n_u_-
4. The same letter goes in both spaces. _f_a_c_t_u_r_e
5. Chair factories. _c_h_a_i_r

(Skinner, 1956: 969-77; Beatty, 2003: 87)
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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.
  - Guth et al.'s (1972) implementation of the system for language learning: integrated a "Sentence Judge" program for the automatic assessment of students' translations.

- The Dartmouth Project
  - Basic preprocessor, spell checker, randomization of questions.
  
  (Ahmad et al., 1969)

1970s-1980s: Communicative CALL

Text reconstruction: Text Unscrambling

- Side by Side Interactive
  - From Pearson Education

Text reconstruction: Storyboard (Levy, 1997: 24)

- Fun With Texts
  - From Carroft

1970s-1980s: Communicative CALL

Simulations

- Yellow River Kingdom
  - http://www.youtube.com/watch?v=Aq6H79QG44M
  - (Seedhouse, 1985)

- A La Rencontre de Philippe
  - The ALLP Project

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1970s-1980s: Other Developments

Authoring
- Launch of the BASIC programming language
- Birth of the teacher-programmer
- Authoring tools
  - Hot Potatoes (http://www.hfoss.com/HFoss/HotPotatoes)
  - Multiple-choice questions (JQuiz)
  - Gap-fill exercises (JClose)
  - Crosswords (JCross)
  - Jumbled sentences/words (JNIV)
  - Ordering exercises (JMatch)
  - Matching exercises (JMatch)

1990s onwards: Integrative CALL

- Applications
  - WebQuest (Dodge, 1999)
  - Task-based learning

The Future of CALL

- Levy (2000) draws our attention to three new areas of CALL research
  - Speech-enabled CALL
    (Special issue CALL 1999, Holland and Fischer, 2000)
  - Mobile CALL (MALL)
    (Special issue ReCALL 2005)
  - CALL 2.0

- Another established field of CALL, Levy mentions is:
  - Intelligent CALL (ICALL), also known as parser-based CALL
    (Levy and Schulte, 2007)

Discussion Questions

Another characteristic of a systematic review is that requires engagement with the users of the review.
- What characterizes good use of technology in language learning?
- Which applications “add value”?
- How can we consider the value of using technology in language learning?
- What are teachers looking for from evaluations of the use of technology in language learning?

NEW TECHNOLOGIES IN EFL
A SYSTEMATIC REVIEW

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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 20% the TL was a European language.

<table>
<thead>
<tr>
<th>Language Skills/Area</th>
<th>Primary</th>
<th>Secondary</th>
<th>Total</th>
</tr>
</thead>
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<tr>
<td>Writing</td>
<td>35</td>
<td>5</td>
<td>40</td>
</tr>
<tr>
<td>Grammar</td>
<td>30</td>
<td>10</td>
<td>40</td>
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<tr>
<td>Pronunciation</td>
<td>10</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Reading</td>
<td>20</td>
<td>5</td>
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</tr>
<tr>
<td>Writing</td>
<td>5</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Speaking</td>
<td>2</td>
<td>0</td>
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</tr>
<tr>
<td>Listening</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Other</td>
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<tr>
<td>Total</td>
<td>90</td>
<td>55</td>
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</table>

In-Depth Review: Results
- 33 papers were identified which met the inclusion criteria.

<table>
<thead>
<tr>
<th>Language Skills/Area</th>
<th>Primary</th>
<th>Secondary</th>
<th>Total</th>
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</thead>
<tbody>
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<tr>
<td>Grammar</td>
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<td>Pronunciation</td>
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<td>Listening</td>
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<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>18</td>
<td>51</td>
</tr>
</tbody>
</table>

Internet: Web Publishing
- Park 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 here 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

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CMC: Discussion Forums
- Chandrasegaran and Kong (2006)
- Technology
  - Discussion forums
  - Teacher set topics: "Which fighter plane?" "Singapore TV!", etc.
- Method
  - 15 y.o. at a secondary school in Singapore
  - 96 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
  - 157 (64%) posts contained stance (total 199 postings)
  - 75 (30%) expressed stance-support (total 127 postings)
  - 83 support moves were identified: personal opinion (21%), fact (27%), hypothetical outcomes (6%) anticipating opposing views (6%)
  - Students showed less evidence of being able to support stance: the may have been due to the fact that they were not informed in the topic

CMC: Chat
- Satar and Ozturun (2009)
- Technology and instruction
  - Text and voice chat
  - Homework activities: Information gap, problem solving, jobseek, and decision making
- Design
  - 15-17 yr olds in middle and high schools in Turkey
  - IV: 1 text chat, 2 voice chat, and 3 control (no homework)
  - DV: (1) Speaking proficiency, (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

Mobile CALL: Text messaging
- Lu (2008)
  - Compared(1) bible-based test message lessons spaced throughout the day with (2) pen-and-paper instruction, i.e. list presentation
  - In the test message condition, students received four text messages per day, two during each of their_commutes
  - Those who received text messages improved more, but the advantage was not retained at post-test
  - Students appreciated the bible-based lessons
  - Students employed positive learning strategies – one control had their 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
- Lai et al. (2009) CAREER System
  - Technology and instruction
  - Computer-Assisted Remedial English Reading system (CAREER) system
  - Learn a personalized list of words and a phonetic rule; read a paragraph of text; Collaborate to reconstruct the whole text: Practice reading for emergent group collaboration; Collaborate to answer comprehension questions
- Method
  - 9th grade Taiwanes students (primary)
  - 6 CAREER vs group work
  - D1: (1) Oral reading fluency, (2) Reading fluency, and (3) Behaviour
- Results
  - Oral reading fluency: Both groups improved and there was no difference between the two groups
  - Reading 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 unneeded behaviours

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Mobile CALL: Mobile Peer-Assisted Learning
  - Lai 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 initiate pronunciation models
      - voiced/unvoiced: Spanish against individual phonemes
      - Feedback
        - (1) waveform display, (2) pitch contour, (3) duration (as graphs), (4) volume display
        - If the student does not reach the correct level of 66% match for a segment, it will be highlighted in the feedback
      - Method
        - 3rd grade (9–10 yr old) Taiwanese students
        - 6. Traditional vs. (Traditional + MEL) System
        - 1st: (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 tasks

Web 2.0: Wikis
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Web 2.0: Wikis
- Mak and Connan (2008)
  - Technology and instruction
    - Wikis as a collaborative writing platform
    - Project to design a new school, with each group working on a different topic.
  - Method
    - 7th year students at a secondary school in Hong Kong
    - Ongoing development of writing produced; and (2) writing processes engaged in (aiding, expanding, rephrasing and correcting ideas)
  - Results
    - Aided by generally discussing the topic and adding their comments to the wiki
    - At the start, students simply added to existing tasks;
    - Over time, they began to edit each others’ tasks
    - Eventually, more collaborative
    - 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
- Lunt (2008)
  - Technology and instruction
    - Use MediaWiki (http://www.mediawiki.org/wiki/Mediawiki) to produce a collaborative project entitled “Our USA”
    - Completing tasks in terms of content and form
    - Students should adopt the affordances of the wiki
  - Method
    - 17 year-old senior high school students in Norway
    - Longitudinal observational/design-based study of collective cognition
      - 8 sessions, over 2 weeks
  - Results
    - Learners that developed topics in a self-contained autonomous mode
    - They then branched out to greater interdependence with other learners
    - Finally, they began to exploit the wiki to engage in a collective Zone of Proximal Development (ZPD)

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Virtual Worlds

- Zheng et al. (2009)
  - Technology and instruction
    - Quest Altalina (http://QuestAltalina.org), a 3D game-like virtual world developed using ActiveVR tools
    - Incorporates CMC (chat, bulletin boards, e-mail, 3D avatars and 2D web-page navigation tool
    - Allows students to travel to virtual lands where they can engage in quests (quests, goals, resources) communicate with other users and mentors and build virtual personas
    - Game-like activities for children with a mythological base story
    - A point-earning system
    - Interact
    - 7th grade students in a middle school in mainland China
    - The Quest Altalina e-learning
    - 46 mins per week for 20 weeks
    - Synchronous communication with Australian partners
  - Outcomes
    - Patterns of (1) language use, (2) media use, (3) engagement in QA activities, (4) engagement in quests

Discussion Questions

- Another characteristic of a systematic review is that requires engagement with the users of the review.
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- What are teachers looking for from evaluations of the use of technology in language learning?