

Use of Education Simulations and Serious Games in Language Instruction

The Interagency Language Roundtable
George P. Schultz national Foreign Affairs Training Center

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Overview

- Where do educational simulations (ES) and serious games (SG) fit within any comprehensive educational system?
 - Independent and comprehensive, but parallel?
 - Dependent augmentation?
- Where do ES & SG fit within a comprehensive program of language instruction?
 - They fall within the controversial field of CALL.

Some arguments against the use of CALL.

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- Computer delivered instruction will lead to over monitoring.
- Extended CALL instruction could produce terminal learners.
- **Students have a right to a teacher who understands the language better than they do.**

Some arguments for CALL

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Wall Street Journal, 1998 (and reviewed January 28, 2008. Page R3)

What We Know About CALL

- There are more opinions than there are facts.
- There are more experts than expertise.
- It is time for a principled analysis of needs and capabilities.

Lets Begin with Some Definitions of Basic Terms

Computer:

- A person who computes.
- A device that computes; especially, an electronic machine that performs mathematical or logical calculations or... processes... information... in accordance with a predetermined program.

Computer:

- A person who computes.
- A device that computes; especially, an electronic machine that performs mathematical or logical calculations or... processes... information... in accordance with a predetermined program.
- **Note: Because of programming challenges we have successfully automated only the worst of our teaching practices.**

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- Supported.
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- **Note: It is not clear whether the meaning here implies standing beside the teacher, the student, or both.**

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- **Note: Language is so complex that even language professionals make mistakes.**



化粧室は後方へ

For Restrooms,
Go back toward your behind.

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Language is Complex Even Without a Translation

A Headline in the *Chronicle of Higher Education* (online blog, 13 Nov 2007):

Berkeley Tree-Sitter Falls, Breaks 2 Limbs

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- To gain knowledge, comprehension, or mastery of something.
- Scientists are still refining their constructs and definitions of what it means to know or comprehend.
- The process is not directly observable and only the outcomes can be measured.
- **Note: Learning is perhaps the least understood of human endeavors.**

Bloom's Taxonomy

- **Evaluation** and persuasion through refined use of professional, literary, and rhetorical skills.
- **Synthesis** of concepts to produce and comprehend abstract ideas and hypothetical situations.
- **Analysis** and definition of factual relationships in paragraph length communications.
- **Application** of skills to create and understand new communications.
- **Comprehension** and use of words and phrases.
- **Memorization** of facts.

Language and Cognition

- **Levels 4 & 5, evaluation and persuasion** through refined use of professional rhetorical skills.
- **Level 3, synthesis** of ideas to produce and comprehend abstract comments and hypothetical situations expressed in essays, chapters, etc.
- **Level 2, analysis** and definition of relationships expressed in multiple interrelated paragraphs.
- **Level 1, application** of skills to create and understand sentence length communications.
- **Level 0+, comprehension and use** of words and phrases.
- **Level 0, memorization** of facts.

Language and Perceived Intelligence

It is good [for people] to become acquainted with languages, for they may have to go abroad, and should be able to talk to people, and not look like fools. I care not how much intelligence you have, if you cannot exhibit it, you look like an ignoramus.

John Taylor, 1852

Another Perspective

- Bloom describes observable outcomes of learning.
- There is also a commonly used hierarchy that describes three types of learning:
 - Learning for limited transfer.
 - Learning for near transfer.
 - Learning for far transfer.

3 Major Types of Learning

- **Memorized** ability for limited transfer.
- **Rehearsed** ability for near transfer.
- **Extemporaneous** ability for far transfer.

The Challenge of CALL

We want to program electronic devices...

to help learners...

through processes that are imperfectly understood...

develop skills in the most complex of human behaviors.

Is the challenge too great?

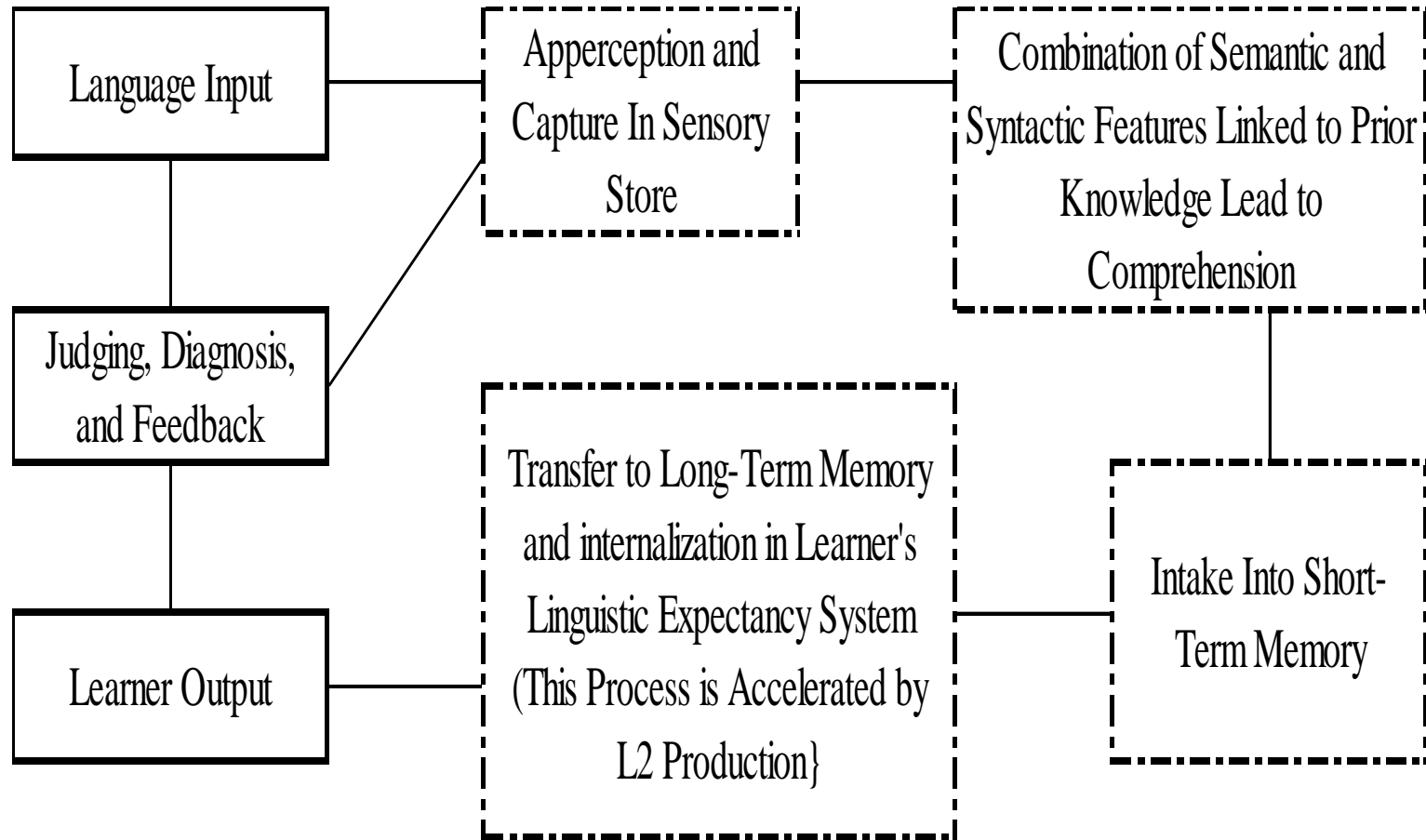
Should we give up?

No, IFF instructional goals are well defined, then CALL programs can be useful.

The Framework for Discussions of CALL effectiveness

- A general model of the language learning process.
- Seven instructional elements that must be defined before the effectiveness of programs can be evaluated.

A Model of the Language Acquisition Process



7 Elements That Define Goals and Capabilities

1. The learners' entering ability level(s).
2. The language skill modalities, tasks, topical domains and text types to be taught.
3. The extent of the instruction defined in terms of both lessons and "learning hours".
4. The type of learning expected.
5. The judging capabilities of the program.
6. The feedback capabilities of the program.
7. The learners' expected exit ability level(s).

Language Learning Requirements And Computer Capabilities

		Assessment and Feedback			
Language Complexity (Production and Reception) including inherent pragmatics and cultural elements		Right / Wrong, try again	Right / Wrong with repeated correct model	Diagnosis with branching	Diagnosis with individualized assistance, & remediation
Paragraphs	Far transfer; extemporaneous proficiency	<p>Will require natural language processing and artificial intelligence capabilities that are not yet available</p> <p>Possible with today's computing capabilities, but quite difficult for non-text applications</p>			
	Near transfer; rehearsed performance				
	Limited transfer; memorized achievement				
Sentences	Far transfer; extemporaneous proficiency	<p>Being done with today's computing capabilities.</p>			
	Near transfer; rehearsed performance				
	Limited transfer; memorized achievement				
Words/Phrases	Far transfer; extemporaneous proficiency				
	Near transfer; rehearsed performance				
	Limited transfer; memorized achievement				

The ILR Proficiency Levels

[With language “text type” highlighted in red]

LEVEL	FUNCTION/TASKS	CONTEXT/TOPICS	ACCURACY
5	All expected of an educated NS [Books]	All subjects	Accepted as an educated NS
4	Tailor language, counsel, motivate, persuade, negotiate [Chapters]	Wide range of professional needs	Extensive, precise, and appropriate
3	Support opinions, hypothesize, explain, deal with unfamiliar topics [Multiple pages]	Practical, abstract, special interests	Errors never interfere with communication & rarely disturb
2	Narrate, describe, give directions [Multiple paragraphs]	Concrete, real-world, factual	Intelligible even if not used to dealing with non-NS
1	Q & A, create with the language [Multiple sentences]	Everyday survival	Intelligible with effort or practice
0	Memorized [Words and Phrases]	Random	Unintelligible

Conclusions

- CALL capabilities and limitations would be better understood if every program came with clear “truth in advertising” statements that describe the 7 essential elements that define its goals and capabilities.
- Producing these statements will require the collaboration of linguists, teachers, and programmers.
- Collaboration should also result in a better definition of needs and better programs.

Some Final Observations

- If a teacher's skills are so limited that s/he could be replaced by a computer – s/he ought to be replaced.
- Good teachers can't be replaced by computers – but good teachers who use computers will replace teachers who don't.

Thank You

Are there any questions?