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Concurrent and retrospective talk as an assessment tool for complex learning

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Talks/written texts as data for complex learning

- "summaries" can be misleading…
  - For a book chapter, students "summarize" by picking out initial, middle, and last statements, not digesting and integrating research pieces focused in the chapter.
- While they talk/write, they build models, reflect, modify their ideas, and understand.
- We need to capture the process of such model building.

Constructive interaction

- Repeated verbalization of "core" concepts
- Multiple representations
- "Vantage view point" to get some global view

↑

- ***Points for formative assessment?***

For formative assessments

- Students could/should
  - be given more chances to express their ideas on the same theme.
  - have more and easier access to their own and others' presentations.
  - be given chances to reflect upon broader scope of their learning.

Context of research

- Undergraduate cognitive science classes.
- Learning objective: Create integrated models of human cognition so that they can control their own cognitive activities, including learning.

Collaborative features

- Jigsaw of sizable constructs like "encoding specificity," "depth of processing," and "knowledge reconstruction at retrieval."
- Jigsaw of research pieces like Collins & Quillian, Tulving, and Loftus work.
- More complex (structured) jigsaw of "topic areas by methodology" matrix.
- With bi-directionally linkable shared notes for integration.

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Assuring repetition

Example class:

- Repeated summary presentation of a fixed set of selected research papers.
  - Wason's selection task
  - "Language and thought" research pieces
- Three times of presentations by seven groups in a semester.

Assuring repetitions

- Repetitions allow teachers/fellow students follow the course of development of their "summary" expressions.
- They support different decompositions, which leads to trials of different structuring.

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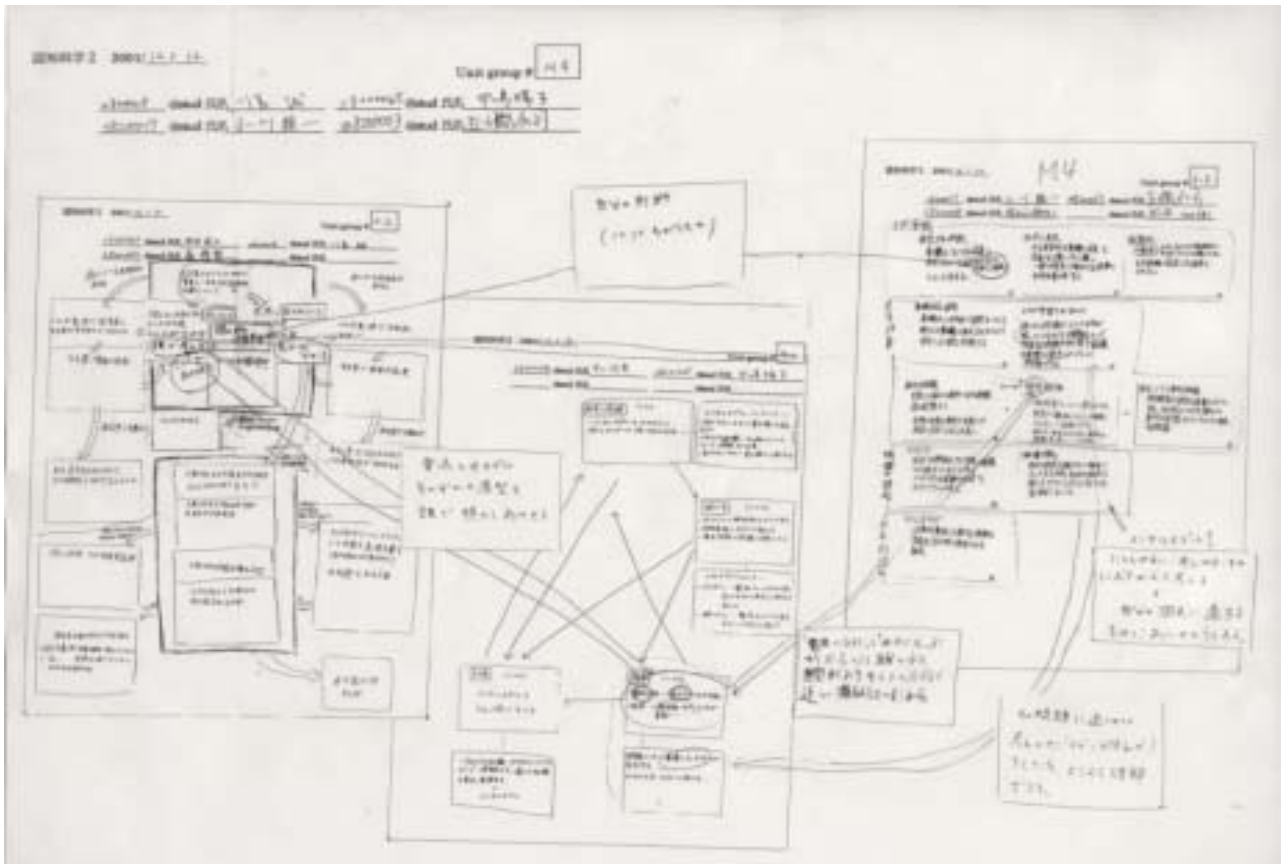
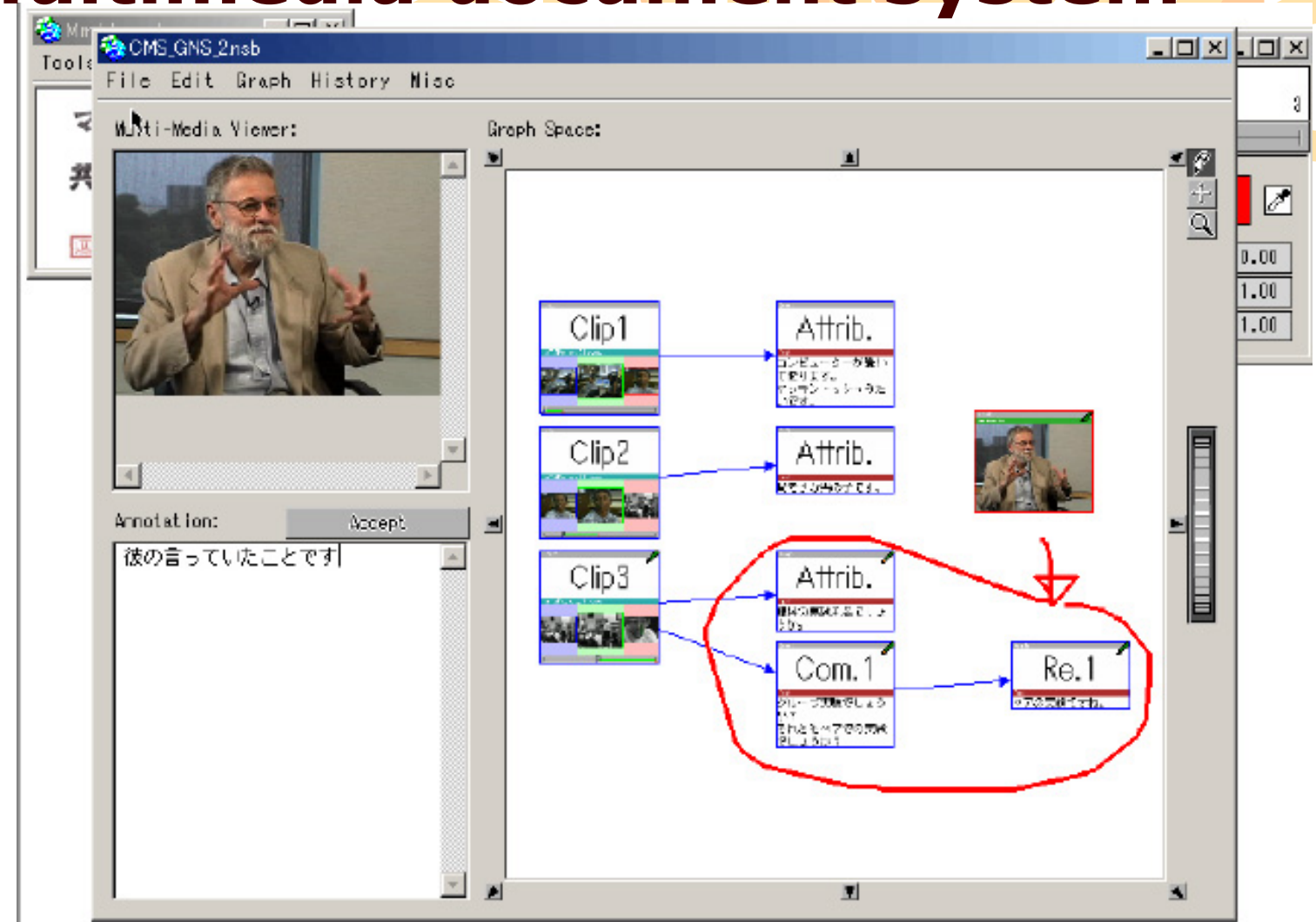
Analog record keeping (1)

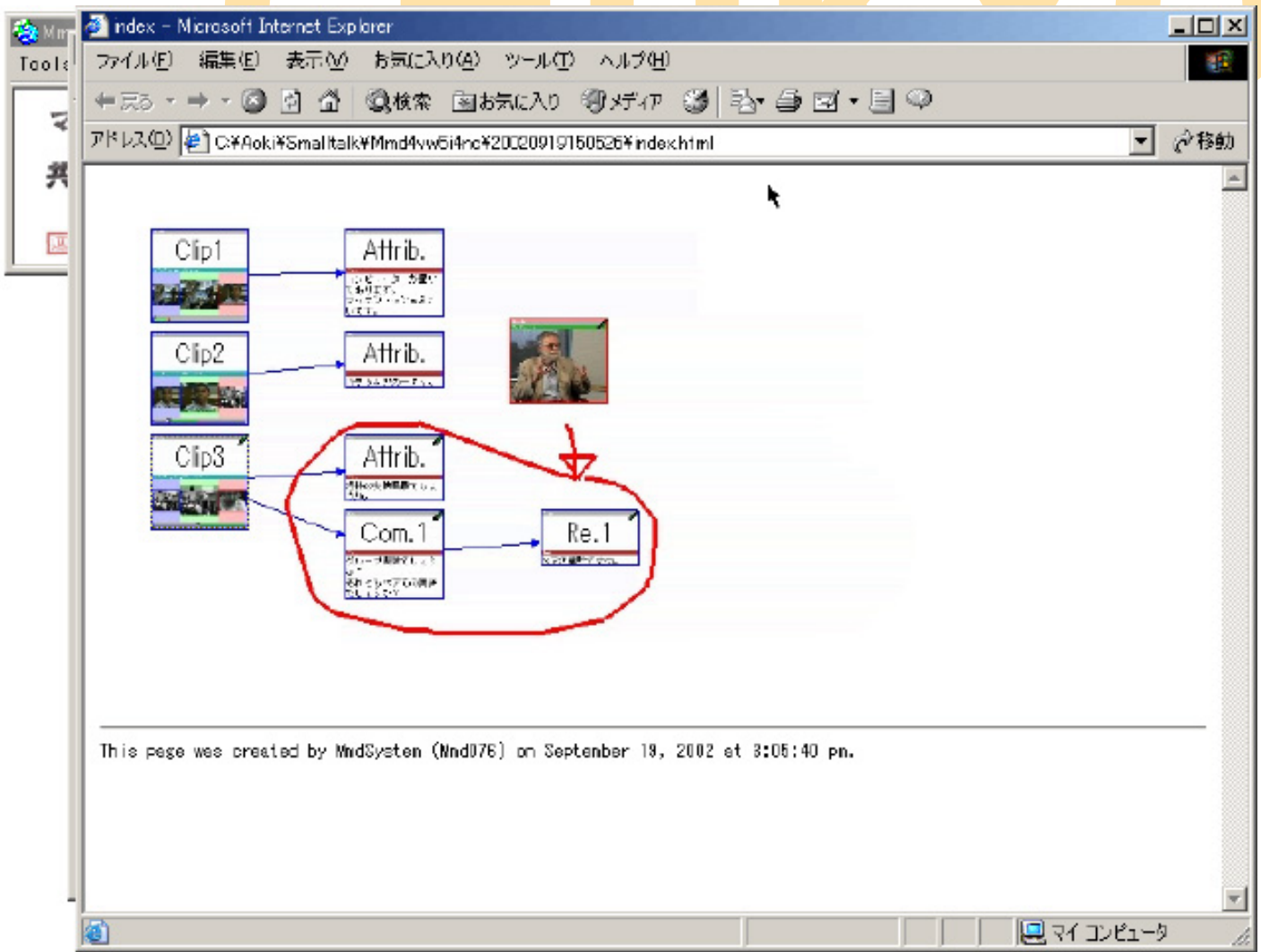
Analog record keeping (2)



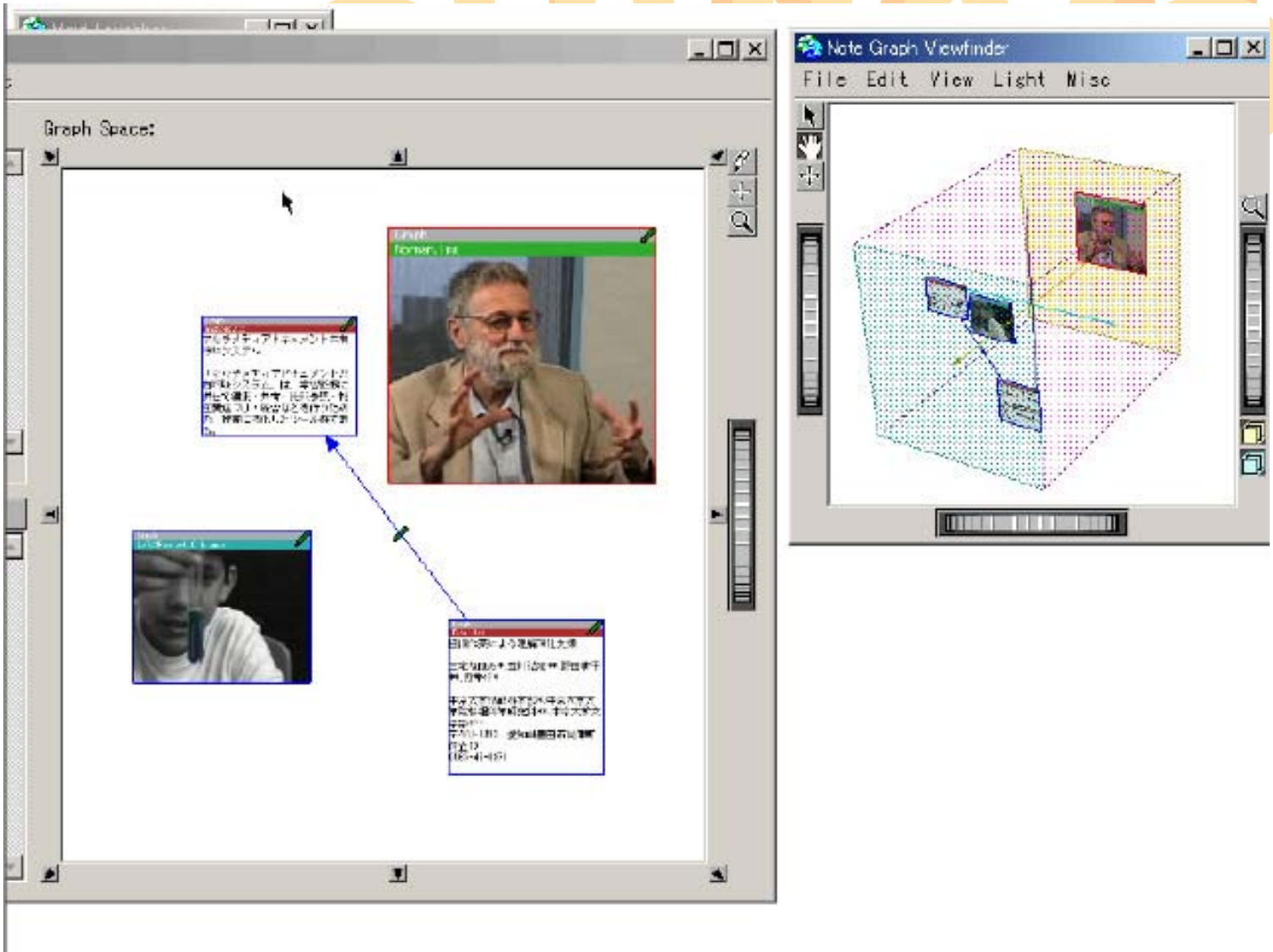
Multimedia document system

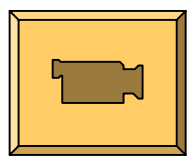


Web publication



3D visualization





Multiple representation record keeping

- It gives hints on size and quality of "chunks."
- It supports "integration by decomposition" strategy.

For formative assessments

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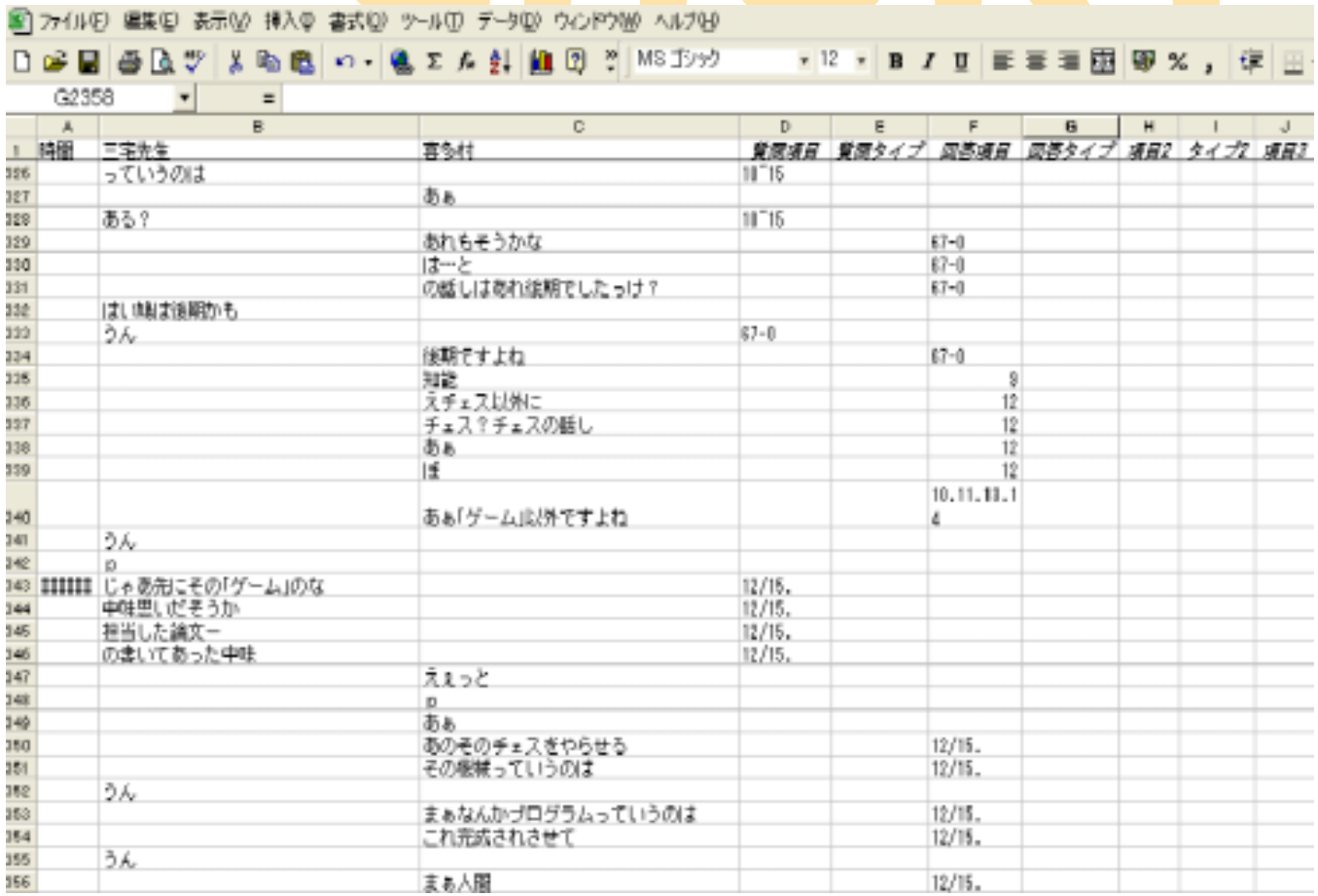
"Vantage viewpoint" for retrospective talk

- Interviewed juniors on their learning in first and second years
  - Twenty-eight students
  - Forty to 90 minutes
  - General prompts to specific guides
  - On 109 topics covered in three introductory cognitive science classes

Tons of these coded sheets of interview data



	A	B	C	D	E	F	G	H	I	J
1	時間	三宅先生	喜多村	質問項目	質問タイプ	回答項目	回答タイプ	項目2	タイプ2	項目3
326		っていうのは		11~15						
327			あぁ							
328		ある？		11~15						
329			あれもそうかな			67-0				
330			はーと			67-0				
331			の話しはあれ後期でしたっけ？			67-0				
332		はい私は後期かも								
333		うん		67-0						
334			後期ですよね			67-0				
335			知能			9				
336			えチェス以外に			12				
337			チェス？チェスの話し			12				
338			あぁ			12				
339			ぼ			12				
340			あぁ「ゲーム」以外ですよね			10.11.88.14				
341		うん								
342		p								
343	######	じゃあ先にその「ゲーム」のな		12/15.						
344		中味思いだそうか		12/15.						
345		担当した論文ー		12/15.						
346		の書いてあった中味		12/15.						
347			えぇっと							
348			p							
349			あぁ							
350			あのそのチェスをやらせる			12/15.				
351			その機械っていうのは			12/15.				
352		うん								
353			まぁなんかプログラムっていうのは			12/15.				
354			これ完成されさせて			12/15.				
355		うん								
356			まぁ人間			12/15.				

Categories of tlaks

- Fragmental pieces
  - Labels, names…
- Rudimentary facts
- Rudimentary relations
- Beginning integrations

Fragmental pieces

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
6		12	3. ゲーム	12	3. ゲーム	12		12	3. ゲーム	12		12	3. ゲーム	12	3. ゲーム	12
7		13	4. 楽	13	4. 楽	13	4. 楽	13	4. 楽	13		13	4. 楽	13	4. 楽	13
8		14		14	5. ウェアラブル	14	5. ウェアラブル	14	5. ウェアラブル	14	5. ウェアラブル	14	5. ウェアラブル	14	5. ウェアラブル	14
9																
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11	<曜日計算>															
12		17	曜日計算	17	曜日計算	17	曜日計算	17	曜日計算	17		17		17		17
13		18		18	問題	18	問題	18		18		18	問題	18		18
14		19	火曜+. . . 実行して答え	19	火曜+. . . 実行して答え	19	火曜+. . . 実行して答え	19		19	火曜+. . . 実行して答え	19	火曜+. . . 実行して答え	19		19
15		20	数値変換による解法	20	数値変換による解法	20	数値変換による解法	20		20	数値変換による解法	20	数値変換による解法	20		20
16																
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20		38	実験内容	38	実験内容	38	実験内容	38	実験内容	38	実験内容	38	実験内容	38	実験内容	38
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26		43		43		43		43		43		43		43		43
27		44		44		47	ネットワーク表象	47	ネットワーク表象	44		44		44		44
28		49	構造化	49	構造化	49		49		49	構造化	49	構造化	49		49
29		51	構造化の実例	51	構造化の実例	51		51		51	構造化の実例	51		51		51
30		53	深い処理	53	深い処理	53	深い処理	53	深い処理	53	深い処理	53	深い処理	53		53
31		55	深い処理の実験	55	深い処理の実験	55	深い処理の実験	55	深い処理の実験	55	?	55		55		55
32		56		56		56		56		56	?	56		56		56
33		58	再構成	58		58		58	再構成	58		58	再構成	58		58
34		60	再構成の実験	60	再構成の実験?	60		60	再構成の実験	60	?	60	再構成の実験	60		60
35		61		61		61	再構成の実例	61		61		61		61		61
36																
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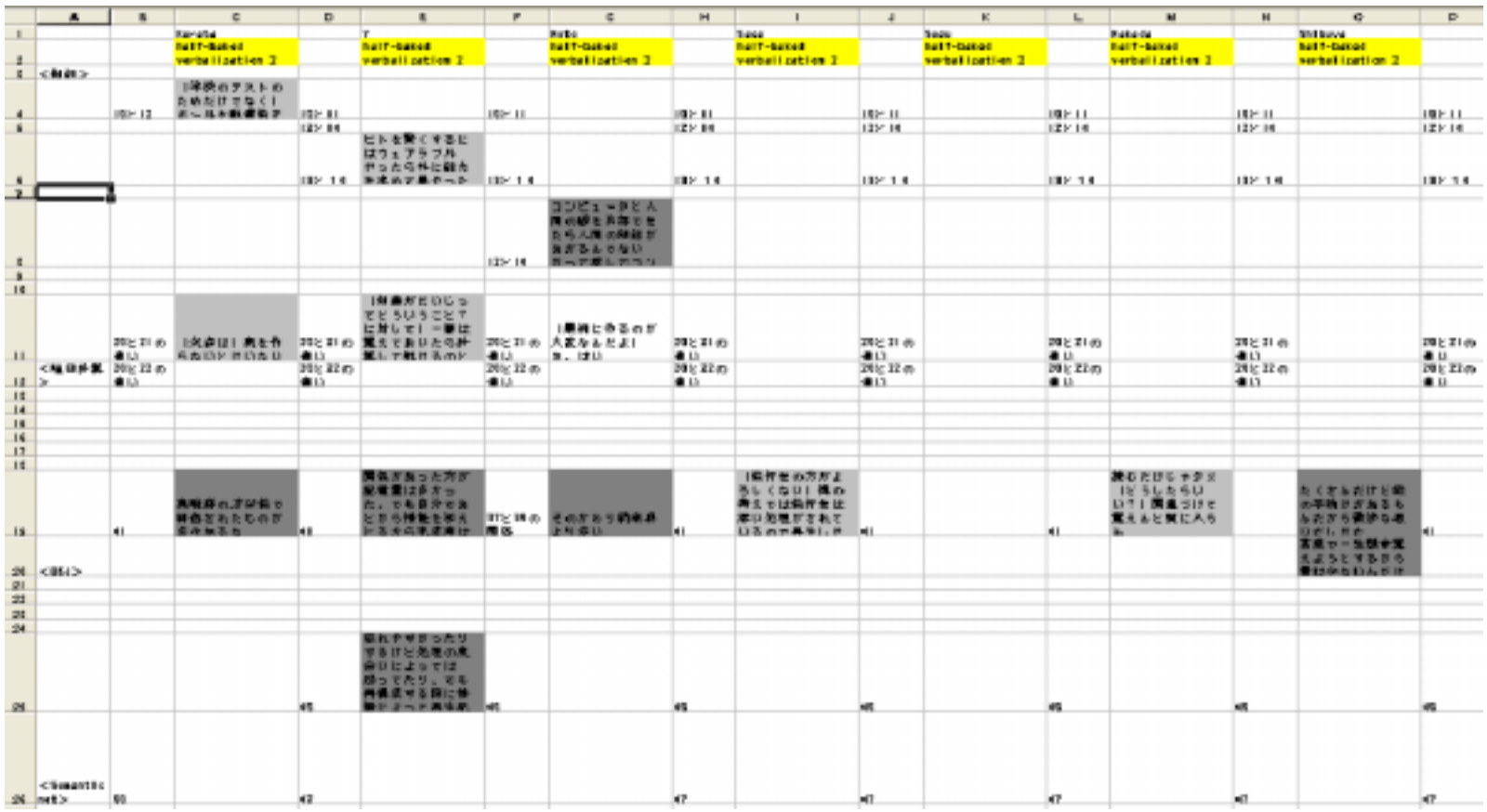
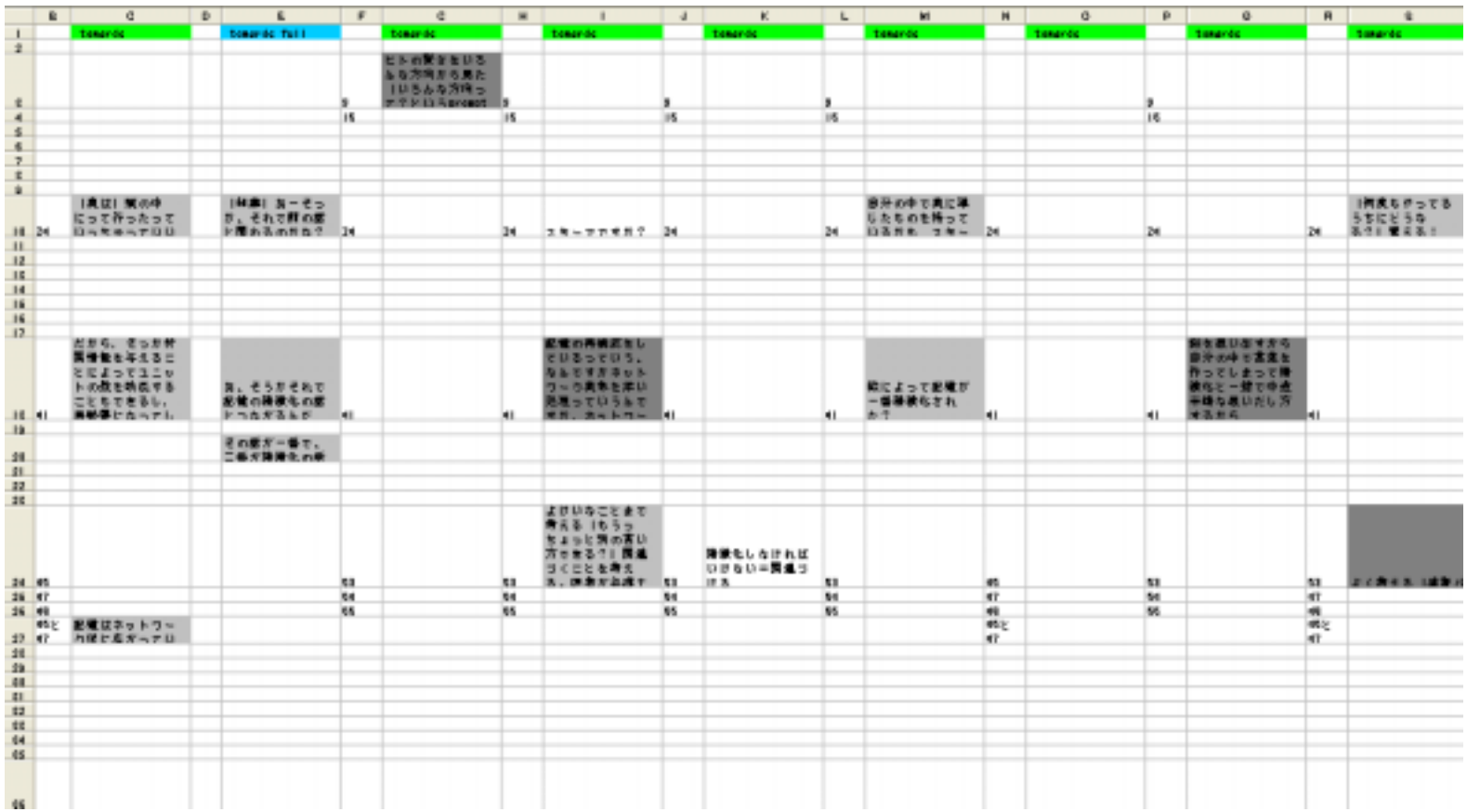
Rudimentary facts

Rudimentary relations



Beginning integrations



Giving vantage viewpoint

- They can “say” fragmental things.
- Some of such things refer to their version of coherent “stories.”
- Some such stories show rudimentary levels of integration for model building.
- Chances for such talks can evoke new connections.
- Such talks can be reflected upon by the learners, to create spontaneous modification of models.

Toward reliable models of comprehension

- "Fragmental" terms appear to turn into fuller expressions over a long period of learning, and this process can be different individual to individual.
- Involving students themselves in this model building may be a promising course of learning.

Dr. Allan Collins

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Harvard Graduate School of Education
October 5, 2001

by Margaret Roosevelt Haas

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"There has always been a great divide between education research and practice. Most practitioners regard education research as irrelevant to their day to day concerns, and so they pay little attention to what researchers recommend."
—Allan Collins, "The Changing Infrastructure of Education Research"

How practitioners use (or in many cases do not use) education research has long interested many academicians. Although most researchers hope that their work will have a lasting impact on the field of education, most educators simply choose to ignore these studies because the dominant psychological methodology usually requires experiments to take place in a laboratory. Such a controlled environment, educators argue, rarely allow situations to occur as they would in a classroom or on the playground. To address those concerns, many researchers have started incorporating new methodologies into the way they conduct their research.

A discussion of one such methodology was the topic of the inaugural lecture in the New Perspectives in Technology and Education Seminar Series. HGSE visiting scholar and professor of education and social policy at Northwestern University Allan Collins presented his findings on the issues surrounding design experiments, a type of research that places the experiments in real-world settings to find out what works in practice.

Journal keeping for processes

- Segmentation and commenting of video
- Journal keeping of the process
- Turning the process record into a video for meta-analyses…