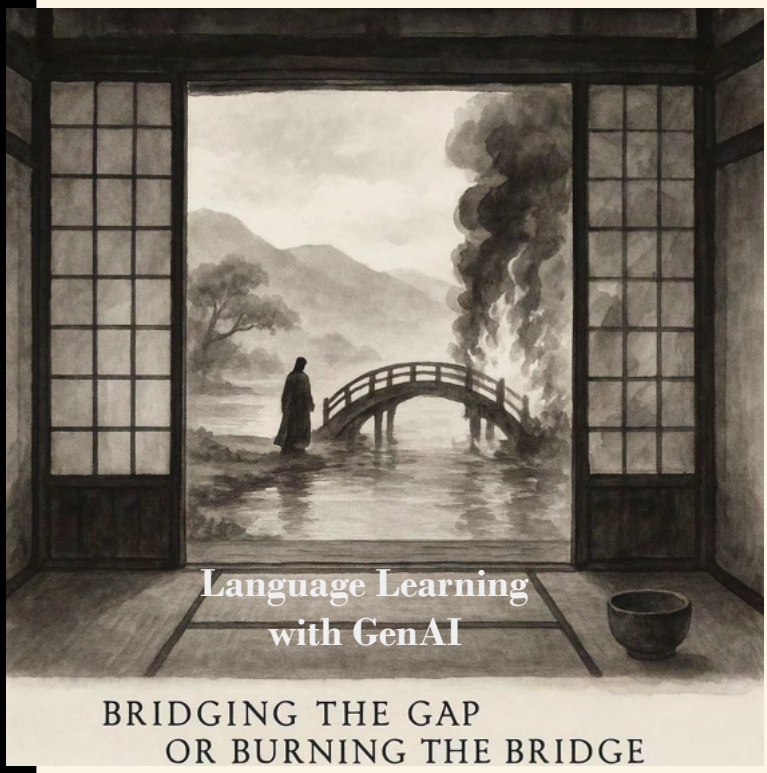



generated with ChatGPT-4o

**MATHIAS SCHULZE**

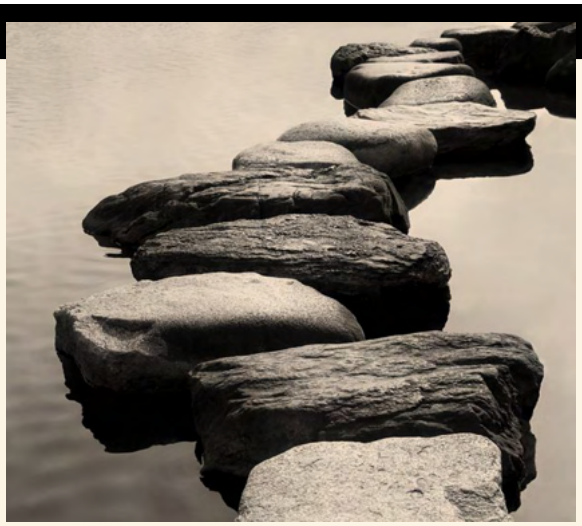
https://PantaRhei.press/mat


https://youtu.be/Dhe-1_6fwU8?si=C05BAcMxKqanOy_c

# Language Learning with GenAI: Bridging the Gap or Burning the Bridge



Ellis, Carolyn; Adams, Tony E. & Bochner, Arthur P. (2010). **Autoethnography**: An Overview. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research, 12*(1), Art. 10, http://nbn-resolving.de/urn:nbn:de:0114-fqs1101108.



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# Language Learning with GenAI: Bridging the Gap or Burning the Bridge

## 2 TRANSITION – analysis of patterns and questions

- Technological determinism and pedagogical agency
- Linguistic rules and language use
- Conceptions of learning and knowledge

## 3 BIG QUESTIONS – What are we going to do?

- Who has agency and what is authentic?
- What are language and communication?
- What counts as knowledge and learning?

## CONCLUSION – And now?



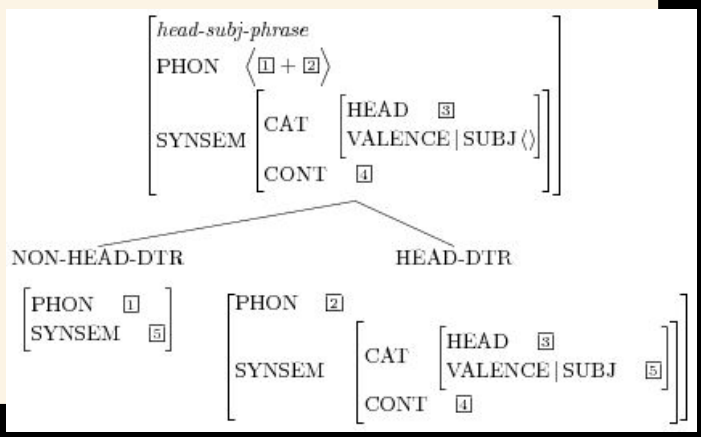
Schulze, Mathias (2001). ***Textana*—Grammar and grammar checking in parser-based CALL**. Unpublished PhD dissertation in Language Engineering. University of Manchester Institute of Science and Technology (UMIST), Manchester, UK.

Schulze, Mathias (2025**). ICALL and AI: Seven lessons from seventy years**. In Yijen Wang, Antonie Alm, & Gilbert Dizon (Eds.), *Insights into AI and language teaching and learning* (pp. 11-31). Castledown Publishers.
https://doi.org/10.29140/9781763711600-02

```
Language Learning Models (LLMs) have revolutionized the field of natural
 language processing, enabling machines to understand and generate human-
like text. At the core of LLMs lies the concept of tokens, which serve as
 the fundamental building blocks for processing and representing text
 data. In this blog post, we'll demystify tokens in LLMs, unraveling
 their significance and exploring how they contribute to the power and
 flexibility of these remarkable models.
```

Marking the tokens of an LLM

HPSG formalism used in NLP




Valentina Tereshkova
(b. 1937)
first female
cosmonaut in 1963

750 x 600 x 680mm
70kg

Argon-16: first board computer
of the Soviet Soyuz T-2 in 1980

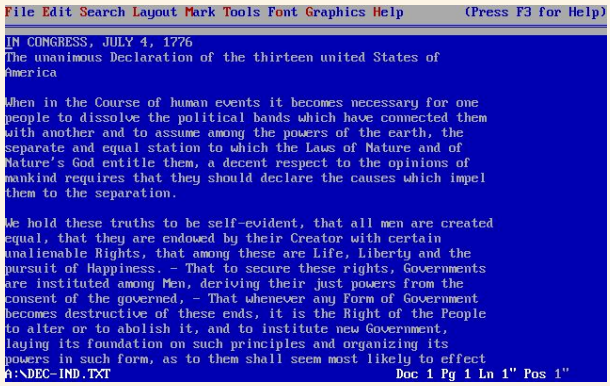
267 x 112 x 40mm
2kg

PNY NVIDIA H100 Graphic Card –
80 GB HBM3
used for training large language models



# COMPUTING IN 1990/91

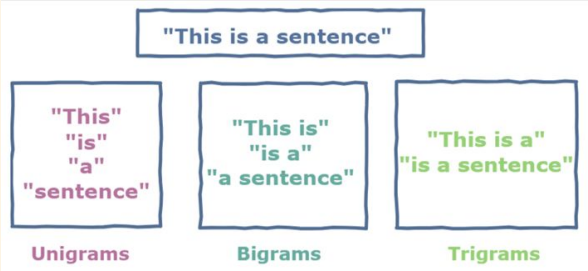
WordPerfect
5.1 for DOS




WordPerfect was known for its macro language, which allowed the creation of fully fledged programs, for example, for document processing and (linguistic) analysis. Recorded keystroke sequences could form the basis for scripting the macro.

Personal computer with
80286 processor and
5¼"floppy disk drive

# NGRAMS AND PROBABILITIES




n-gram example

$$r_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2}\sqrt{\sum_{i=1}^{n}(y_i - \bar{y})^2}}$$

Pearson Correlation Coefficient for a sample

*Meaningfully used and calculated with large corpora.*
*Using statistics for language analysis is done in statistical NLP.*

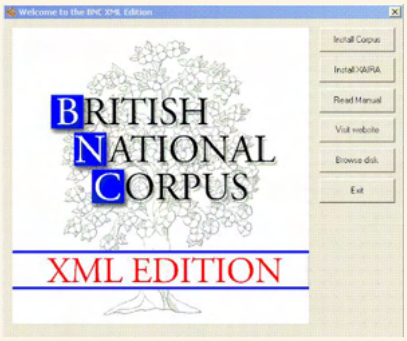


# TEXTS AND CORPORA 1991—2022

GPT-3 was built on ~300–500 billion words (570 GB of cleaned text) from internet sources.

Brown, T. B., Mann, B., Ryder, N., Subbiah, M., Kaplan, J., Dhariwal, P., Neelakantan, A., Shyam, P., Sastry, G., Askell, A., Agarwal, S., Herbert-Voss, A., Krueger, G., Henighan, T., Child, R., Ramesh, A., Ziegler, D. M., Wu, J., Winter, C., ... Amodei, D. (2020). Language models are few-shot learners. *Advances in Neural Information Processing Systems*, 33, 1877–1901. https://arxiv.org/abs/2005.14165

*GPT-4 is undocumented, but is said to have been trained on a corpus that was larger by several levels of magnitude*




British National Corpus (BNC) with approx. 100 million words


**Freiburger Korpus** with 222 transcribed audio recordings with a total of 68 hours and 6 minutes, compiled between 1955 and 1974.

# LANGUAGE LEARNING: RUSSIAN


Sprachkabinett (language lab) in the GDR
ullstein bild (1973) from Gettyimages


Russian language textbook (GDR, 1970s)

- initial focus on the Cyrillic alphabet and grammar (declension and conjugation)
- focus on forms; ideologically infused meaning secondary
- practically oriented topics (introduction, description, directions, classroom language)
- textbook exercises (grammar, vocabulary), imitation (choir), monologs, partner dialogs, listening and reading (news), recitation and singing



# RUSSIAN AS A "WORLD LANGUAGE"

**The role of Russian in the Soviet Union**

- A 1938 decree mandated the compulsory teaching of Russian in all non-Russian schools.
- The education laws of 1958–1959 reinforced the status of Russian as a compulsory subject in schools across the USSR.
- 1978: Decree No. 835 of the Soviet Council of Ministers asserted Russian as a "second native language" for all Soviet citizens.

The role of Russian internationally

- **Warsaw Treaty Organization (1955–1991):** Russian functioned as a primary working language within the organization's operations.
- **Comecon (1949–1991) The Charter (1959/60) stipulated: "The working language of the Council shall be Russian."** (https://treaties.un.org/doc/Publication/UNTS/Volume%20368/volume-368-I-5245-English.pdf)

Ministerium für Volksbildung (1971) *Lehrpläne für den erweiterten Russischunterricht Klassen 3 bis 10 der allgemeinbildenden polytechnichschen Oberschule*. p. 4. https://scripta.bbf.dipf.de/viewer/image/1692866451/1/

Die Hauptaufgabe des erweiterten Russischunterrichts besteht darin, auf der Grundlage sicherer lexikalischer und grammatischer Kenntnisse die sprachlichen Fähigkeiten und Fertigkeiten der Schüler sowohl im mündlichen als auch im schriftlichen Sprachgebrauch allseitig und planmäßig zu entwickeln. Im Vordergrund stehen dabei Übungen im Hören und Sprechen. Damit die Schüler die russische Sprache sicher als Verständigungsmittel gebrauchen können, soll die russische Sprache auch in vielfältigen Formen im täglichen Leben (Briefverkehr, Schülertreffen, Kulturprogramme in russischer Sprache, Besuch sowjetischer Filme u.a.) angewandt werden. Bereits in den Anfangsklassen sind die Schüler an den Gebrauch der russischen Sprache als Unterrichtssprache zu gewöhnen.

# ENGLISH FOR YOU

https://youtu.be/cODbvbbt7p0?si=n8AJh2RSO-N0K2fu&t=872

"Karl Marx in London" unit 50 of the first GDR TV course *"English for you"* (1967)

- one size fits all: TV
- language lab: pronunciation exercises
- contrived communicative situations for role play

- Russian started at school with 11-year-olds (or 9-year-olds); English started with 13-year-olds
- almost no interaction with first-language speakers



# ACTIVITY THEORY AND LANGUAGE PEDAGOGY

Schulze, Mathias and Grit Liebscher (2010) Going in cycles: Courseware and material development for written communication. *CALICO Journal 27*(3), 554-563

- Vygotsky (1896–1934) was not widely published or discussed in East Germany, even after his rehabilitation in the 1950s, although (Soviet) Activity Theory was central in East German teacher education
- Aleksei N. Leontiev (1903–1979): main author whose publications were adopted
  - activity – main unit of analysis, driven by motive
  - action – part of the activity, oriented towards a goal, intentional
  - operation – technical or habitual, often automated, triggered by a condition
  - activity components: (collective) subject—(abstract) object—(mediating) artifact
- Pjotr J. Galperin (1902-1988) with his concepts of stepwise formation of mental actions and SCOBAs

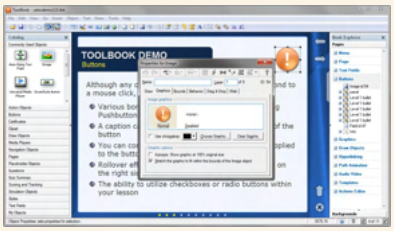
White, Benjamin J., Gabriela Adela Gánem-Gutiérrez, & Mathias Schulze (2021). Conceptualization and orientation in concept-based language instruction: An introduction to the special issue. *Language and Sociocultural Theory 8*.1, 1–7.


Vygotsky's *Thinking and Speech*; publication in 1934

# TUTORIAL CALL

Heift, Trude and Mathias Schulze (2015) Tutorial CALL. *Language Teaching 48*.4, 471-490.

Schulze, Mathias (2024) Tutorial CALL — Language practice with the computer. In: Regine Hampel and Ursula Stickler (Eds.) *Bloomsbury Handbook of Language Learning and Technologies.* (pp. 35–47) New York: Bloomsbury Publishing.

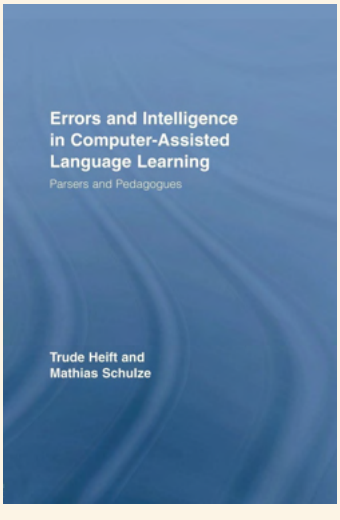



By SumTotal Systems, Inc. - CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=52493913

- **TUCO II**: Heimtraud F. Taylor and Werner Haas (Ohio State University) German grammar with fill-in-the-blank and multiple-choice questions
- Schulze, Mathias (1994) **Computer-Assisted Language Learning. Students' CALL Guide.** Manchester: Manchester Metropolitan University.
- Jones, Chris with Mathias Schulze (1995) **Gertie** (multi-media vocabulary-learning software for German, French, Spanish and Italian) Manchester: Manchester Metropolitan University.
  Scripted with ToolBook, a Microsoft Windows based e-learning content authoring program.
- CALIS (Computer Aided Language Instruction System):at Duke University (1979—95) by Phelps, L., Hossain, K.O., Bessent, H., Clark, T. Borchardt, F., and Kunst, R.: authoring tool with regular expressions used for providing individualized and contingent corrective feedback

| | |
|---|---|
| . | Any single character |
| .* | Zero or more of any characters |
| .+ | One or more of any characters |
| .+? | One or more of any characters, but fewer as possible |
| .{3} | A set of 3 of any characters |
| .{3,} | A set of 3 or more of any characters |
| .{2,4} | A set of 2 to 4 of any characters |
| (.+) | One or more of any characters, grouped into subexpression |
| [abc] | Any single character from the list (e.g. "a" or "b" or "c") |
| [^abc] | Any single character except the ones from the list |
| [a-z] | Any single character from the range (e.g. "a" to "z") |
| aa\|bb\|cc | Any one occurrence of the alternatives (e.g. "aa" or "bb" or "cc") |
| \\ | Use an escape character to match an actual backslash "\" |
| \w | Any single alphanumeric character (including an underscore) |
| \s | Any single space character (space, tab, new line) |
| \b | Word boundary |
| \A | Start of the input text |
| \Z | End of the input text |




## ICALL IS AI AND CALL

| | | |
|---|---|---|
| First article on ICALL | 1978 | Weischedel, R. M., Voge, W. M., & James, M. (1978). An Artificial Intelligence Approach to Language Instruction. *Artificial Intelligence, 10*, 225-240. |
| Seminal collection on ICALL | 1995 | Holland, V. M., Kaplan, J. D., & Sams, M. R. (Eds.). (1995). *Intelligent Language Tutors: Theory Shaping Technology.* Mahwah, NJ: Lawrence Erlbaum Associates. |
| ICALI SIG in CALICO | 1990s | |
| Special issue of ReCALL | 1999 | Schulze, M. and M.-J. Hamel (eds.) (2021/1999) *Natural language processing in computer-assisted language learning. ReCALL 11*.S1. |
| Monograph on ICALL | 2007 | Heift, T. and M. Schulze (2007) *Errors and intelligence in computer-assisted language learning. Parsers and pedagogues.* New York: Routledge. |
| Review article on ICALL | 2008 | Schulze, M. (2008) AI in CALL: Artificially inflated or almost imminent? *CALICO Journal 25*.3, 510-527. |

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ChatGPT-4o



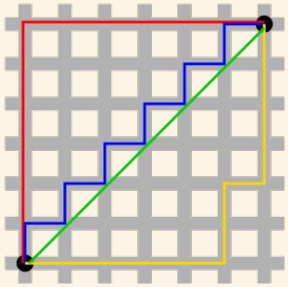
## (1) TECHNOLOGICAL DETERMINISM AND PEDAGOGICAL AGENCY

- AI has been around since 1956
- CALL started also in the context of "programmed instruction"
  Skinner, B. F. (1958). The science of learning and the art of teaching. *Harvard Educational Review, 24*(2), 86–97.
- Early computers and software constrained what the user could do much more so than today.
- CALL was tools + tutorial CALL until email tandems (CMC).
- In the interaction with the computer – as in Tutorial CALL– the locus of control is either more with the machine or more with the human.
- Using a GenAI chatbot is interaction with the machine and not computer-mediated communication. The rules of human-computer interaction apply and not the Gricean maxims of conversation.
  Dix, A., Finlay, J., Abowd, G. D., & Beale, R. (2004). *Human-computer interaction* (3rd ed.). Pearson Education.
  Grice, P. (1975). "Logic and conversation". In Cole, P.; Morgan, J. (eds.). *Syntax and semantics. Vol. 3: Speech acts.* New York: Academic Press. pp. 41–58.

*Be*
- *informative*
- *truthful*
- *relevant*
- *clear*

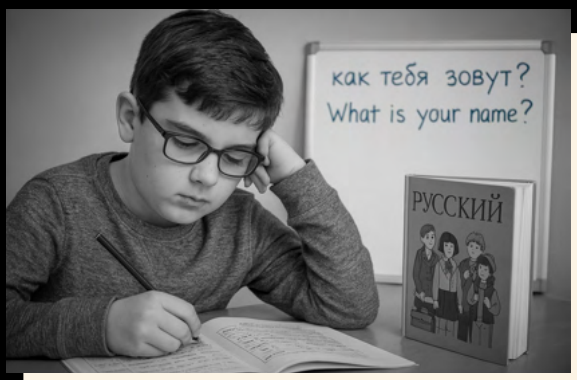
## (2) LINGUISTIC RULES AND LANGUAGE USE

- State ideologies and educational policies determine second-language use
- Public discourses shape general learner motivation (status of language learning and teaching and of individual languages)
- Typological language differences vs. subjective difficulty and objective complexity
- Focus on forms and the analysis of surface forms – a relic of the past?
- Language proficiency is the rectilinear distance of complexity, accuracy, and fluency; accuracy has been overemphasized in assessment
- Sustained communication opportunities are often lacking



https://en.wikipedia.org/wiki/Taxicab_geometry
rectilinear distance
Manhattan distance
Mannheim distance



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- Grade 10 certificate: 6 years of Russian obligatory
- Grade 12 certificate: 8 years of Russian and 6 years of a second foreign language (often English or French)
- University graduation in any subject: test in a relevant second language (translation of an academic text and an oral exam)

## (3) CONCEPTIONS OF LEARNING AND KNOWLEDGE

- To master a language (beherrschen = to command, rule; владеть = to possess) was to master its forms accurately
- language learning = language practice; Повторение — мать учения. >> Repetition is the mother of learning.
- national standards, state curricula, and oral exams
- Presentations on prescribed topics and also Content and Language Integrated Learning (CLIL) = regional studies as knowledge items
- Grammar-translation method, audiolingual method, communicative approach — all being used
- a lot of resources, limited success

generated by ChatGPT-4o




# (1) WHO HAS AGENCY AND WHAT IS AUTHENTIC?

i. Humans produce (linguistic) forms; machines generate plausible forms
ii. Humans make meaning (with texts); machines cannot and do not, because they do not perform intentional actions but conditional operations
iii. Humans imbue generated texts with meaning
iv. Humans learn through actions (need to have the intention); machines learn from data through adjusting their parameters at each iteration

v. Authentic texts in language education:
   a. "a stretch of real language, produced by a real speaker or writer for a real audience and designed to convey a real message."
      Morrow, K. (1977). Authentic texts and ESP. In S. Holden (Ed.), *English for Specific Purposes* (pp. 13–17). Modern English Publications.
   b. fulfills a communicative function outside the teaching context
   c. respects the context of situation in which the text appears, including cultural, social, and pragmatic dimensions
      Kramsch, C. (1993). *Context and Culture in Language Teaching*. Oxford University Press.

Machine learning is like giving it a collection of graded student essays and asking it to generalize what "good" writing looks like. Deep learning is like giving it access to the entire internet's worth of text and letting it form its own sense of style, coherence, and meaning—without being told any explicit linguistic theory.

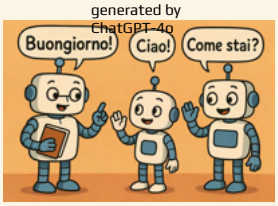
generated with ChatGPT 4o

# (2) WHAT ARE LANGUAGE AND COMMUNICATION?

underlined = machines are not capable (yet)
dashed = machines are not fully capable

- Language properties Yule, G. (2020). *The Study of Language* (7th ed.). Cambridge University Press
  - Displacement
  - Arbitrariness
  - Productivity
  - Cultural transmission
  - Duality
  - Discreteness

generated by ChatGPT-4o




- Language functions see Austin, J.L. (1962). *How to Do Things with Words*. Edited by J.O. Urmson & Marina Sbisà. Oxford: Clarendon Press. / Searle, J.R. (1969). *Speech Acts: An Essay in the Philosophy of Language*. Cambridge University Press.
  - communicative
  - cognitive
  - performative
  - social identity and phatic
- Language is the passport to a social group.

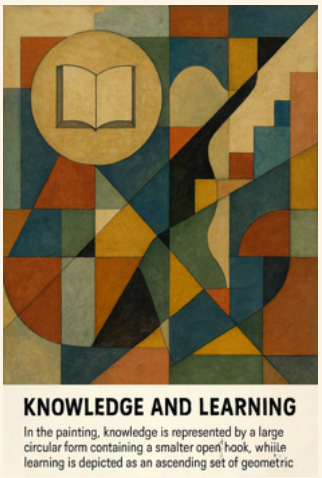
Communication Hymes, D. (1974). Foundations in Sociolinguistics: An Ethnographic Approach. Philadelphia: University of Pennsylvania Press.

| | | |
|---|---|---|
| **S** | **Setting & Scene** | Physical time and place (setting), and the psychological or cultural context (scene). |
| **P** | **Participants** | Who is involved? Speaker, listener, bystanders, etc. |
| **E** | **Ends** | Purposes and outcomes (both intended and actual) of the interaction. |
| **A** | **Act Sequence** | The form and content of what is said, and the order in which it is said. |
| **K** | **Key** | Tone, manner, or spirit (e.g., serious, sarcastic, formal, playful). |
| **I** | **Instrumentalities** | Channels (e.g., oral, written) and code (language or dialect used). |
| **N** | **Norms** | Social rules governing interaction (e.g., turn-taking, politeness). |
| **G** | **Genre** | Type of communicative event (e.g., interview, joke, sermon, conversation). |



# (3) WHAT COUNTS AS KNOWLEDGE AND LEARNING?

- hallucinations
- object vs. outcome
  Леонтьев, А. Н. (1975). *Деятельность. Сознание. Личность.* Москва: Политиздат.; Leontiev, A. N. (1978). *Activity, Consciousness, and Personality.* Englewood Cliffs, NJ: Prentice-Hall. (Trans. M. J. Hall)
- illusion of learning
  Mollick, E. (2025). Post-apocalyptic education. What comes after the homework apocalypse. https://www.oneusefulthing.org/p/post-apocalyptic-education.
- students' trust in the teacher
  Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An Integrative Model of Organizational Trust. The Academy of Management Review, 20(3), 709–734.
  - ability
  - benevolence
  - integrity
- learning = a relatively permanent change in behavior or mental processes due to experience




generated by ChatGPT-4o

# Turing test

Turing, A.M. (1950). Computing machinery and intelligence. Mind. A quarterly review of psychology and philosophy 59.236, 433–460.

Turing statue in Sackville Gardens
in Manchester, England
Glyn Hughes (2001)

- **The imitation game**
  "It is played with three people, a man (A), a woman (B), and an interrogator (C) who may be of either sex. The interrogator stays in a room apart from the other two. The object of the game for the interrogator is to determine which of the other two is the man and which is the woman. … We now ask the question, 'What will happen when a machine takes the part of A in this game ?' Will the interrogator decide wrongly as often when the game is played like this as he does when the game is played between a man and a woman ? These questions replace our original, 'Can machines think ?' "
- Opposing opinions:
  - Theological "Thinking is a function of man's immortal soul. God has given an immortal soul to every man and woman, but not to any-other animal or to machines. Hence no animal or machine can think."
  - Heads-in-the-sand: "The consequences of machines thinking would be too dreadful. Let us hope and believe that they cannot do so."



# CONCLUSION(S)

1) Computers have become a very potent and sophisticated but also a partially opaque digital technology. Limitations of use and transparency of process decreased. Machine learning has led to leveling processes and can lead to loss of human control. **Teachers** need to learn and teach humanistic and effective use of GenAI.
2) We are conversing with powerful chatbots that can pretend to be anything we can imagine, but it is always us making sense of plausible form sequences. **Teachers** need to clarify motives for language learning and be able to communicate them effectively.
3) We need to continue to build new knowledge and find new ways of learning and knowing. **Teachers** need to identify and then prioritize new knowledge and newly relevant old knowledge.

# EARLIER CONCLUSIONS


- Hubbard, Philip & Mathias Schulze (2025) **AI and the future of language teaching – Motivating sustained integrated professional development (SIPD)**. *International Journal of Computer Assisted Language Learning and Teaching 15*.1., 1–17. DOI:10.4018/IJCALLT.378304 https://www.igi-global.com/gateway/article/full-text-html/378304&riu=true
- Schulze, Mathias (2025). **ICALL and AI: Seven lessons from seventy years.** In Yijen Wang, Antonie Alm, & Gilbert Dizon (Eds.), *Insights into AI and language teaching and learning* (pp. 11-31). Castledown Publishers. https://doi.org/10.29140/9781763711600-02
- Schulze, Mathias (2025). **The impact of artificial intelligence (AI) on CALL pedagogies.** In: Lee McCallum, & Dara Tafazoli (Eds.) *The Palgrave Encyclopedia of Computer-Assisted Language Learning.* Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-51447-0_7-1.
- Schulze, Mathias, Caws, Catherine, Hamel, Marie-Josée, & Heift, Trude. (2025). **Adaptive instruction.** In Glenn Stockwell & Yijen Wang (Eds.), *The Cambridge Handbook of Technology in Language Teaching and Learning* (pp. 195–212). Cambridge: Cambridge University Press.
- Schulze, Mathias (2024) **Tutorial CALL — Language practice with the computer.** In: Regine Hampel & Ursula Stickler (Eds.) *Bloomsbury Handbook of Language Learning and Technologies*. (pp. 35–47) New York: Bloomsbury Publishing.
- Schulze, Mathias (2008) **AI in CALL: Artificially inflated or almost imminent?** *CALICO Journal 25*.3, 510-527.


# LANGUAGE LEARNING WITH GENAI: BRIDGING THE GAP OR BURNING THE BRIDGE

# THANK YOU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https://PantaRhei.press/mat