Research papers of interest

Will be using Google Scholar and the university library to find papers related to the subject area.

Main subject areas to search for:

**Language learning/acquisition**

* Spaced repetition
* Input vs output
* Efficient learning techniques

**Computer assisted language learning – CALL**

* Mobile assisted language learning – MALL
* Mobile learning - ML

In terms of language learning specific papers, I won’t limit papers by the date they were published as language learning is something that has been around for hundreds of years and by limiting the research I could miss some crucial research. When it comes to papers related to technology and applications for learning I will only include papers from the past 10 years (2008 onwards) so as to make sure the information is up-to-date and relevant.

**Journals**

Computers and Education

Journal of Computer Assisted Learning

Language Learning

The Modern Language Journal

Studies in Second Language Acquisition

Computer Assisted Language Learning

Language Learning and Technology

Journal of Experimental Psychology: Learning Memory and Cognition

Brain and Language

Journal of Memory and Language

Language & Communication

Language Sciences

**Papers**

A Trainable Spaced Repetition Model for Language Learning

<http://www.aclweb.org/anthology/P16-1174>

**EMERGING TECHNOLOGIES FROM MEMORY PALACES TO SPACING ALGORITHMS: APPROACHES TO SECOND-LANGUAGE VOCABULARY LEARNING**

*“Learning vocabulary in this way, through context, makes it much more likely that more understanding of its correct usage will be gained than through learning an item from a list, or from its appearance in a single (inauthentic) dialog. Seeing the new item in actual use also provides more information on variations it may undergo, such as stem changes, inflections, or affixes, all important aspects of being able to actually use a recently acquired item in real communication.”*

This paper also mentions RTK, SuperMemo

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.472.6575&rep=rep1&type=pdf>

Spaced Learning Enhances Subsequent Recognition Memory by Reducing Neural Repetition Suppression <https://www.mitpressjournals.org/doi/full/10.1162/jocn.2010.21532>

An Investigation into The Effect of Targeted Vocabulary Learning Using a Spaced Repetition Flashcard System on TOEIC Scores <https://www.agulin.aoyama.ac.jp/opac/repository/1000/12507/>

The efectiveness of computer-based spaced repetition in foreign language vocabulary instruction: a double-blind study <https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1120&context=engl_pubs>

Computer Assisted Language Learning <https://www.tandfonline.com/doi/pdf/10.1080/09588221.2010.520675?needAccess=true>

**Technologies**

* Anki
* Duolingo
* SuperMemo

**Learning techniques**

* Spaced repetition
* Memory palaces
* Mnemonic elaboration

<https://www.supermemo.com/en/articles/20rules>

<https://www.gwern.net/Spaced-repetition>

**References and further reading from Wikipedia page**

## References[[edit](https://en.wikipedia.org/w/index.php?title=Spaced_repetition&action=edit&section=6)]

* 1. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-1) "Human Memory: Theory and Practice", Alan D. Baddeley, 1997
  2. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-2) [*Mace, C. A.*](https://en.wikipedia.org/wiki/Cecil_Alec_Mace) (1932). Psychology of Study. p. 39.
  3. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-3) Spitzer, H. F. (1939). Studies in retention. Journal of Educational Psychology, 30, 641–657.
  4. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-4) Melton, A. W. (1970). The situation with respect to the spacing of repetitions and memory. Journal of Verbal Learning and Verbal Behavior, 9, 596–606.
  5. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-5) Landauer, T. K., & Bjork, R. A. (1978). Optimum rehearsal patterns and name learning. In M. Gruneberg, P. E. Morris, & R. N. Sykes (Eds.), Practical aspects of memory (pp. 625–632). London: Academic Press.
  6. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-6) See [#Software](https://en.wikipedia.org/wiki/Spaced_repetition#Software)
  7. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-7) [*"Implementing a neural network for repetition spacing"*](https://www.supermemo.com/english/ol/nn_train.htm). www.supermemo.com*. Retrieved 2017-07-15*.
  8. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-8) Cull, W. L. (2000). Untangling the benefits of multiple study opportunities and repeated testing for cued recall. Applied Cognitive Psychology, 14, 215–235.
  9. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-9) [Chapter 6:Is Expanded Retrieval Practice a Superior Form of Spaced Retrieval?](http://psychnet.wustl.edu/coglab/wp-content/uploads/2015/01/2007-Is-expanded.pdf), A Critical Review of the Extant Literature, DAVID A. BALOTA, JANET M DUCHEK, and JESSICA M. LOGAN
  10. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-10) Pimsleur, Paul (February 1967). "A Memory Schedule". The Modern Language Journal. Blackwell Publishing. **51** (2): 73–75. [*doi*](https://en.wikipedia.org/wiki/Digital_object_identifier):[*10.2307/321812*](https://doi.org/10.2307%2F321812). [*JSTOR*](https://en.wikipedia.org/wiki/JSTOR) [*321812*](https://www.jstor.org/stable/321812)
  11. [**Jump up^**](https://en.wikipedia.org/wiki/Spaced_repetition#cite_ref-11) ["Spaced repetition: a hack to make your brain store information", The Guardian, retrieved 2016-04-26](https://www.theguardian.com/education/2016/jan/23/spaced-repetition-a-hack-to-make-your-brain-store-information)

## Further reading[[edit](https://en.wikipedia.org/w/index.php?title=Spaced_repetition&action=edit&section=7)]

* Caple, C. (1996). "The Effects of Spaced Practice and Spaced Review on Recall and Retention Using Computer Assisted Instruction". Dissertation for the degree of Doctor of Education, North Carolina State University.[[1]](http://www.eric.ed.gov/ERICWebPortal/custom/portlets/recordDetails/detailmini.jsp?_nfpb=true&_&ERICExtSearch_SearchValue_0=ED427772&ERICExtSearch_SearchType_0=no&accno=ED427772)
* de Boer, V. (2003, August). "Optimal Learning and the Spacing Effect: Theory, Application and Experiments based on the Memory Chain Model". Artificial Intelligence Master's Thesis for Computational Psychology, University of Amsterdam.[[2]](http://www.few.vu.nl/~vbr240/publications/Scriptie.pdf)
* Dempster, F. N. (1988). "The Spacing Effect: A Case Study in the Failure to Apply the Results of Psychological Research". American Psychologist, 43(8), 627-634.
* Greene R. L. (2008). Repetition and spacing effects. In Roediger H. L. III (Ed.), Learning and memory: A comprehensive reference. Vol. 2: Cognitive psychology of memory (pp. 65–78). Oxford: Elsevier.
* The Guardian (2016). "Spaced Repetition: A hack to make your brain learn more information". [[3]](https://www.theguardian.com/education/2016/jan/23/spaced-repetition-a-hack-to-make-your-brain-store-information)
* Karpicke, J. D., & Roediger, H. L. (2007). "Expanding Retrieval Practice Promotes Short-Term Retention, but Equally Spaced Retrieval Enhances Long-Term Retention". *Journal of Experimental Psychology*: Learning, \* Memory, and Cognition, 33(4), 704-719.[[4]](https://web.archive.org/web/20100627015744/http:/psych.wustl.edu/memory/Roddy%20article%20PDF's/Karpicke_Roediger_2007_JEPLMC.pdf)
* Kerfoot, B. P.; Baker, H. E.; Koch, M. O.; Connelly, D.; Joseph, D. B.; Ritchey, M. L. (2007). "Randomized, Controlled Trial of Spaced Education to Urology Residents in the United States and Canada". The Journal of Urology. **177**(4): 1481–1487. [*doi*](https://en.wikipedia.org/wiki/Digital_object_identifier):[*10.1016/j.juro.2006.11.074*](https://doi.org/10.1016%2Fj.juro.2006.11.074). [*PMID*](https://en.wikipedia.org/wiki/PubMed_Identifier) [*17382760*](https://www.ncbi.nlm.nih.gov/pubmed/17382760).
* Pavlik, P. I. (2005). *The Microeconomics of Learning: Optimizing Paired-Associate Memory*. PhD, [Carnegie Mellon](https://en.wikipedia.org/wiki/Carnegie_Mellon).
* Pavlik, P. I.; Anderson, J. R. (2008). "Using a model to compute the optimal schedule of practice". Journal of Experimental Psychology. **14** (2): 101–117. [*doi*](https://en.wikipedia.org/wiki/Digital_object_identifier):[*10.1037/1076-898X.14.2.101*](https://doi.org/10.1037%2F1076-898X.14.2.101). [*PMID*](https://en.wikipedia.org/wiki/PubMed_Identifier) [*18590367*](https://www.ncbi.nlm.nih.gov/pubmed/18590367).
* Dr Piotr Wozniak (Feb 1999). [*"Effective learning: Twenty rules of formulating knowledge"*](http://www.supermemo.com/articles/20rules.htm). — advice on making flashcards for spaced repetition.

<https://scholar.google.co.uk/scholar?hl=en&as_sdt=0,5&qsp=7&q=spaced+repetition+leitner&qst=i>

Card-based design combined with spaced repetition: A new interface for displaying learning elements and improving active recall

Xuan-Lam Pham a, Gwo-Dong Chen a, \*, Thi-Huyen Nguyen b,Wu-Yuin Hwang b

a Department of Computer Science and Information Engineering, National Central University, Taiwan

b Graduate Institute of Network Learning Technology, National Central University, Taiwan<https://ac.els-cdn.com/S036013151630077X/1-s2.0-S036013151630077X-main.pdf?_tid=f5185442-8892-47b4-80fe-1b490f99ab0e&acdnat=1540236698_66d13f25389aa45b326c8952aaabbdb4>

<http://www.aclweb.org/anthology/P16-1174>

A Trainable Spaced Repetition Model for Language Learning

[https://library.port.ac.uk/dissert/view.php?dis\_id=13032&rtn=2#](https://library.port.ac.uk/dissert/view.php?dis_id=13032&rtn=2)

<https://library.port.ac.uk/dissert/index.php>

<http://eds.b.ebscohost.com/eds/results?vid=4&sid=f4ac5dee-97b2-4836-94ad-b71635fe9ce6%40pdc-v-sessmgr05&bquery=(language+AND+acquisition)+OR+(language+AND+development)+OR+(language+AND+learning)&bdata=JmNsaTA9RlQxJmNsdjA9WSZ0eXBlPTAmc2l0ZT1lZHMtbGl2ZQ%3d%3d>

<https://www.elsevier.com/en-gb/search-results?query=language%20learning&labels=journals&page=1>

<https://www.journals.elsevier.com/journal-of-memory-and-language/most-cited-articles>

<https://www.sciencedirect.com/science/article/pii/S0749596X15000236>

<https://ac.els-cdn.com/S0749596X15000236/1-s2.0-S0749596X15000236-main.pdf?_tid=dcede8bd-f9ee-4ac5-8c19-c94ac8beba07&acdnat=1540914632_1c3a7940597a474a91e416e4cd7dad5e>

<https://www.scopus.com/record/display.uri?eid=2-s2.0-84979289564&origin=inward&txGid=b7c44dcdd503bb0cd6e236f6313be521>

<https://www.scopus.com/record/display.uri?eid=2-s2.0-84929147616&origin=inward&txGid=309a2074ddb35f2c29a25d968c37d212>

<https://www.scopus.com/record/display.uri?eid=2-s2.0-84947968957&origin=inward&txGid=5972b8d0cf803678200e04305e40d011>

<https://www.scopus.com/record/display.uri?eid=2-s2.0-84940191805&origin=inward&txGid=0672ffdbd04443dccfce3d77d8113650>

<https://www.scopus.com/record/display.uri?eid=2-s2.0-84973293869&origin=inward&txGid=9282d330cad8e578377024a7562bd71a>

<https://www.scopus.com/record/display.uri?eid=2-s2.0-85014016307&origin=inward&txGid=d957caf469c80e1d8e78d1d8576c10b6>

<https://www.journals.elsevier.com/language-and-communication>

<https://www.journals.elsevier.com/brain-and-language>

Project notes and findings from evernote

What's the optimal amount of retention to aim for considering that the higher retention rate one has the more work one has to put in and therefore more time they have to put into study. Making long intervals causing people to forget more information could be more efficient in the long run.

<https://m.youtube.com/watch?a=&feature=youtu.be&v=uurlmW96GOg>

<https://m.youtube.com/watch?a=&feature=youtu.be&v=kOj2xLTX_sY>

SM2 algorithm

[www.supermemo.com/english](http://www.supermemo.com/english)

Removing ease factor from the algorithm: why it's not useful to language learners

<http://www.blueraja.com/blog/477/a-better-spaced-repetition-learning-algorithm-sm2>

Mention in PID about how there are a lot of language learning apps out there, a lot of which aren't based on research. Right this before the part about spaced repetition.

Check advanced software engineering lecture 2 slides for uml tools

**Paragraph at end of chapter in report on how I stuck to gant chart**

g two principles (Nakata, 2008, pp. 5–6): 1. a successful recall from memory yields superior retention to mere presentation of the target item; and 2. successfully recalling an item from memory afer a delay is more efective than recalling it immediately afer we learn it.

While research suggests that students fnd fashcards to be a useful learning tool (Wissman, Rawson, & Pyc, 2012), there is no denying that vocabulary acquisition is a complex process encompassing many aspects of the word knowledge beyond the simple “formmeaning” mapping (Nation, 2001).

High and low fidelity prototypes

<http://massimmersionapproach.com/table-of-contents/anki/low-key-anki/intro/>

判断と決断を減らすこと for buttons

<https://onlinelibrary.wiley.com/doi/10.1111/j.1540-4781.1989.tb05321.x>

<https://onlinelibrary.wiley.com/doi/10.1111/j.1540-4781.2009.00970.x>