

The time, from each mp4, is accompanied by a summary or a quote to make it easier for teachers, who may not have the time or inclination to read each formal reference.

References in the Increasing the Duration of Long Term Memory Recall mp4

Time	Summary or quote Formal reference
0:45	<p>“Since the spacing effect was first discovered by Ebbinghaus in 1885, research has consistently shown that learning performance improves if multiple study sessions are separated in time (or ‘spaced’) rather than massed together.</p> <p>EEF 2014 A Review of Educational Interventions and Approaches Informed by Neuroscience (page 29-30)</p>
2:50	<p>The benefits from retrieval practice are greater for students with lower working memory capacity.</p> <p>Agarwal, P.K., Finley, J.R., Rose, N.S., & Roediger H.R., Benefits from retrieval practice are greater for students with lower working memory capacity <i>Memory</i> 25(6):1-8 August 2016</p>
3:10	<p>Expanding interval, as opposed to fixed-interval, retrieval practice is more efficient.</p> <p>Retrieval practice over the long term: Should spacing be expanding or equal-interval? Kang, S.H.K., Lindsey, R.V., Mozer, M.C., and Pashler, H. Psychonomic Society, Inc. 2014</p>
3:25	<p>Overlearning, getting learners to practise more questions once the learners have “got the skill”, adds little, if any durability to learning.</p> <p>Rohrer, D. & Taylor, K. (2006) The effects of overlearning and distributed practice on the retention of mathematics knowledge. <i>Applied Cognitive Psychology</i>, 20, 1209-1224.</p>
4:07	<p>Giving feedback when the learner can’t retrieve (recall the learning) makes retrieval practice more effective. Feedback after a night’s sleep is more effective than immediate feedback.</p> <p>Pashler, Rohrer, Cepeda & Carpenter (2007). Enhancing learning and retarding forgetting: Choices and consequences. <i>Psychonomic Bulletin & Review</i> 2007, 14 (2) 187-193</p>

References in the Effectively Increasing Working Memory Capacity mp4

0:00	<p>“The majority of children with poor working memory are slow to learn in the areas of reading, maths and science, across both primary and secondary school years”. Learners with smaller working memories experience a double whammy of disadvantage - they are more reliant on chunks in long term memory to learn and yet are less likely to build these chunks in lessons.</p> <p>Gathercole, S. Working memory in the classroom, 2008, Presidents’ Award Lecture at the Annual Conference of The British Psychological Society</p>
0:10	<p>A small proportion of learners with smaller working memory capacities, don’t go on to become low attaining learners in maths, but most do.</p> <p>Joni Holmes - Working memory and classroom learning, Cambridge University Press ELT 2018 https://www.youtube.com/watch?v=WUxo5s8HHcE</p>
0:20	<p>“Working memory storage capacity is important because cognitive tasks can be completed only with sufficient ability to hold information as it is processed. ... a constant, underlying mechanism: a central memory store limited to 3 to 5 meaningful items in young adults.”</p> <p>The Magical Mystery Four: How Is Working Memory Capacity Limited, and Why? Cowan, N., February 2010, Current Directions in Psychological Science 19(1):51-57</p>
0:30	<p>Learners living with poverty are likely to have a smaller working memory capacity than their peers.</p> <p>Farah M.J., Shera, D.M., Savage, J.H., Betancourt, L., Giannetta, J.M., Brodsky, N.L., Malmud, E.K., Hurt, H. (2006) Childhood poverty: Specific associations with neurocognitive development. Brain Res 1110 : 166 - 174</p>
0:32	<p>Learners living with trauma are likely to have a smaller working memory capacity than their peers.</p> <p>El-Hage, W., Gaillard, P., Isingrini, M., Belzung, C., Trauma-related deficits in working memory, February 2006, Cognitive Neuropsychiatry</p>
0:42	<p>If we live with poverty and trauma too long, working memory capacity doesn’t bounce back. I’ve lost my source for this for now</p>
1:30	<p>“Use an ‘improving spiral’, where you come back to the same concepts and ideas and add increasingly more complex new information”. Deliberate practice of similar but different problems assists the learner in building chunks in long term memory, which enables learning to be retained. Chunks also provide perceptual cues or triggers, so that the expert, can quickly and easily decide which chunk or chunks are likely to be useful to help solve a given problem.</p>
5:10	<p>Gobet, F. (2005). Chunking models of expertise: Implications for education. Applied Cognitive Psychology, 19, 183-204.</p>
2:20	<p>Symptoms of working memory given here are place holding, missing steps and given up.</p> <p>Joni Holmes, Susan E. Gathercole, and Darren L. Dunning, Poor Working Memory: Impact and Interventions. In Joni Holmes, editor: Advances in Child Development and Behavior, Vol. 39, Burlington: Academic Press, 2010, pp. 1-43. ISBN: 978-0-12-374748-8</p>
6:10	<p>Re low attainment and poor attendance “the correlation is evident, causation is more complex.”</p> <p>Part 1: Attendance in Schools, ETI Good Practice report 2016, DfE</p>

References in the Smaller Working Memory Friendly Teaching mp4

0:50	About 5% of high school students, couldn't learn some new maths in this experiment, but about 30% couldn't remember this learning for a week. (Attending high school in the U.S.A. which is equivalent to university here, means the students are unlikely to be low attaining learners and we don't know about their attainment in maths).
5:00	Rohrer, D. & Taylor, K. (2006) The effects of overlearning and distributed practice on the retention of mathematics knowledge. <i>Applied Cognitive Psychology</i> , 20, 1209-1224.
1:45	Teachers should fade scaffolding after teaching. The duration over which the "fade" should occur is not quantified, but this writer thinks during the course of a single lesson is too fast for many low attaining learners. van de Pohl, J., Volman, M. & Beishuizen, J. <i>Educ Psychol Rev</i> (2010) Scaffolding in Teacher-Student Interaction: A Decade of Research 22: 271
3:00	When teachers hold back from teaching new learning until the learners have mastered all the pre-requisite skills, attainment is raised. Effectiveness of mastery learning programs: A meta-analysis 1990 Kulik, C.C., Kulik, J.A., & Bangert-Drowns, R.L.
3:10	When teachers teach the "right grain size" attainment is raised. Prior problem solving, which helps us create schema, in turn helps us to automate future problem solving - giving us more working capacity for the unfamiliar parts of a problem. Even a very complex schema can be used by working memory as a single element. Building and using an increasing number of ever more complex schemas, by "combining elements of lower level schemas in long term memory" allows skilled performance to develop. Sweller, J., van Merriënboer, J.J.G., & Paas, F.G.W.C. (1998). Cognitive architecture and instructional design. <i>Educational Psychology Review</i> , 10, 251-296.
10:45	Most of the changes which happen in Long Term Memory, the processes of consolidation and reconsolidation, which we colloquially call learning, happen during sleep. Learning How to Learn: Powerful mental tools to help you master tough subjects Barbara Oakley and Terrence Sejnowski, https://www.coursera.org/learn/learning-how-to-learn
13:20	Our own timely practice research, during trials shows the majority of the lowest set (using timely practice) catch up to at least the median of the set above (not using timely practice). https://timelypractice.atlassian.net/wiki/spaces/CKB/pages/1278345247/Research+ours see the Summary