Science Journal of Sociology and Anthropology
ISSN: 2276-6359
http://www.sjpub.org

Published By
Science Journal Publication
International Open Access Publisher

Research Article

Against Forgetting There is No Cure - However, "Triple Coding" Study for Long-Term Retention of Vocabulary (10 months) in a Class 10 (Gymnasium)

Ludger Schiffler

Affiliation: Freie Universität Berlin (FU-Berlin)
E-mail Address: ludger.schiffler@fu-berlin.de
Phone Number: 0049 30 891 4844

Accepted on August 01, 2016

Abstract: "Triple coding" means that the students learn with the help of the teacher the new contextual vocabulary by using gestures, by mental visualization during relaxation or by drawing mind maps and by "helping pair work" before they have to do their homework. In the first two phases, the teacher offers different "learning aids", for instance, explaining them the Latin roots of 28 of the 54 new words, as the students had studied Latin along with English for 5 years. The short-term review after the 45 minutes of learning (54 words) with triple coding showed that the students could translate 40,5 words (75 %) into English. The first long-term review after one month showed there has been no significant increase in memorizing vocabulary of the students that they had been learning for the past one month. Three months later, the triple coding learning was repeated, but this time with mind maps. The long term review after 4 months showed that students could translate 78 % of the new words and after 10 months 74% into English. In an additional controlling it could be demonstrated that the good performance can be attributed to the method and not to accidental revision during the 10 months.

Keywords: vocabulary learning, short-term memory, long-term memory, learning by gesture, mental visualization, relaxation, mind maps, helping pair-work, key-word method.

1. Introduction to Improve the Short and Long-Term Memory

1.1. The Improvement in Short Term Memory by Triple Coding

The precondition for a long-term memory is to help the students to memorize as much as possible in their short-term memory (measured immediately after completion of the learning phase). A further repetition will lead to better long-term memory [iii]. Generally the teacher tries to achieve this goal through a vivid introduction of the lesson and by learning the vocabulary as homework. However, this does not lead to a long term memory for the majority of the students. Therefore, we investigated more efficient alternative, the triple coding.

This means that the teacher presents the vocabulary in three phases. In the first phase, the students learn with movement, in the second with relaxation (Schiffler 2012, 114-117) and mental visualization [iv], alternatively, with concrete visualization in the form of mind maps (Neveling 2004). In the third phase, the students ask each other to translate the word into English in the form of "helping partners work". (Schiffler 2012 37-43). The learning by movements and by mental visualization of the movement has a favorable effect on memorizing, based on the discovery of mirror neurons by Rizzolatti et al. (2003). These neuroscientists have discovered that the movement and the mental visualization of the movement are closely linked to language, because they are in the Broca's speech center of the brain. The effectiveness of learning only with movement has been confirmed by Sambanis (2007 and 2010) for the teaching of English and by Hille (2010) for the Latin lessons, by Schiffler (2012, 131-150) for the teaching of French in six classes 9, but with triple coding.

1.2. Previous Research on Long-Term Memory

With regard to the long-term memory while learning in relaxation Lozanov has (1978) achieved the best results for teaching foreign languages, but no result could be confirmed by replication (Schiffler 1989/1992). Schiffler (1988) explored the long-term memory in three groups of students learning French without prior knowledge. In 3 ½ hours, the group with relaxation and movement could translate 45 words more (12.5%) into German than the control group. However, the difference was only significant on the 10%, which could be regarded at most as an indication. But the right track was laid by. The long-term memory after one month showed that the students who were able to demonstrate a high result in the short-term-memory had the same result in long-term memory.

1.3. Helping Partners Work

In further six studies with students (Schiffler 2012, 134-145), the learning with partners was introduced as an additional learning method to the existing methods of learning with movement and relaxation. (Schiffler 2012, 40). The research by Zimmermann (1977) for the "exposure" of underperforming students led to the development of "helping" partner work. It is characterized by a fast rhythm regardless of whether the response was spontaneous or not. The interrogating student helps his partner by telling the beginning of the context or the entire context to the vocabulary. Thus, the "exposure" or the learning inhibiting awareness could be avoided.

1.4. The learning Aids from Previous Studies

Triple coding was investigated in six studies, all in French lessons in class 9 (Schiffler 2012, 134-145). In five, the pupils had to learn more than 50 words with the context in 45 minutes. In the sixth, this time in 60 minutes, the students had to learn and to translate into French even more than 80 words with the context. An important component of the triple coding is the systematic use of teaching aids (Schiffler 2012 127-130), for which the teacher is responsible, especially in the first two (teacher-centered) phases.

Here, he can use his entire didactic knowledge effectively. The learning aids are: The written learning words with the context are always shown on the overhead projector in front of the students (Butzkamm 2007). [v] Then they are pronounced in the choir, then with a partner. In the second phase, they are pronounced in relaxation murmuring or as inner speech. In this phase, the teacher uses mnemonic aids such as the keyword method to connect with a word in the mother tongue or in the foreign language learned already by the students. Then he forms a mental image (Atkinson 1975 119) or "association of both formal and meaning elements and use of aural and imagery use (Nation 1982 27). The so-called keyword method has been found to be significantly better using an artificial language of Stork (168 2003,). Other aids are to give the structure of the foreign context in the native language (Schiffler, 100 -104), to give the Latin root of the English word or orthographic peculiarities.

The high teaching and learning results of 70% with triple coding in short-term memory could actually be regarded as the best condition for a good long-term memory, if it is assumed that the students learn the remaining 30% working with text during the following lessons transferring them into long-term memory. This assumption has not been confirmed by the present investigation, as will be shown later in the review of the second hypothesis.

1.5. Promote Long-Term Memory Through Mind Maps

Neveling (2004, 120-142) reached good long-term results in her research with learning vocabulary by mind maps. This provided the impetus for this study with the question whether there is not yet a more effective method to improve the long-time memory than the inherent repetition in the following lesson. Neveling found that the words that have been drawn in mind maps by the students led to an average long-term memory of 48% without additional repetition after 13 months. (Neveling 2004, 270). In foreign language teaching, these are the long-term studies for the longest period. In the present investigation, the students were given the 54 words, divided into three parts according to three different themes in order to draw three mind maps in 45 minutes time.

2. The Long-Term Study in the English Class 10

2.1. The Choice of Students and Of the "Learning Words"

An English class 10 (Gymnasium), which was composed of 30 students [vi], was selected. They were well suited to the above outlined learning aids, because they had been learning English and Latin for the past 5 years. As neuropsychology explains the different spheres of knowledge form different memory tracks in the brain. If languages are from the same family, they help each other in retaining as well as for faulty developments. English and Latin are so far apart that they hardly interfere. Among the total 54 identified learning words 28 were derived from Latin [vii]. In the absence of reminding references to the corresponding Latin root, it is observed that the Latin root mostly remain unnoticed. However, if the teacher makes a reference, especially in the phase of relaxation, then this is a mnemonic aid for promoting the long-term memory.

In this class, the subject teacher intended to read two challenging texts of two different school textbooks that deal critically with information technology [viii]. 91 difficult words were chosen from these texts. These words were embedded in the original context, the students were asked to translate them into German, but without using foreign words. For example, the word “participatory” should not be translated by "partizipatorisch", even if could be assumed that the students had a passive knowledge of the meaning of the word.

So the 54 "learning words" have been identified, because no student could translate them into a real “German” word. These words were shown with contextual translations on an overhead-projector during the first learning phase. The "learning words" were marked by bold printing. After this learning phase, the students received the same text pages, but the ‘learning words were printed in the English text had been removed and had to be translated based on the German word.

2.2. The 54 Learning Words in Context

We need more ***participatory*** media (1) - Wir brauchen mehr Medien mit ***Mitwirkungsmöglichkeit.***

We have to ***compete from*** the 1950s ***onward*** **(2-3) -** Wir müssen ***seit*** den 50er Jahren ***konkurrieren***.

They ***remained*** the property of ***broadcasting corporations*** **(4-6)-** Sie ***blieben*** im Eigentum der ***Rundfunkanstalten*.**

We finance ourselves by advertising ***revenue*** **(7)-** Wir finanzieren uns durch Werbe***einnahmen***.

We sell ***broadcasting time*** for commercials **(8) –** Wir verkaufen ***Sendezeit*** für Werbespots.

They ***exert*** influence on the ***content*** **(9-10) –** Sie ***üben*** Einfluss auf den ***Inhalt aus***.

We ***appeal*** to certain target groups. **(11) –** Wir ***richten*** uns ***an*** bestimmte Zielgruppen.

The ***reduced*** content can be ***stored***. (12- 13) – Der ***verkürzte*** Inhalt kann ***gespeichert*** werden.

We have new forms of ***dissemination*** **(14) –** Wir haben neue Arten der ***Verbreitung.***

The internet ***access*** *has* ***spread*** *by* ***file sharing*** **(15-18) –** Der Internet- ***Zugang*** hat sich durch ***gemeinsame Akteneinsicht verbreitet.***

Dangers are resulting from ***invasion*** *of* ***privacy*****, (19-20)** – Gefahren entstehen durch das ***Eindringen in die Privatsphäre***,

and from copy right ***infringement*** **(21) –** und durch die ***Verletzung*** des Urheberrechtes

and it ***constitutes*** a revolution. (22) – und ***stellt*** eine Revolution ***dar.***

The prophecies are ***exaggerated***. (23) – Diese Prophezeiungen sind ***übertrieben***.

This is a ***media hype***. (24) – Das ist ein ***Medienrummel***.

Media ***literacy*** is now very important. (25) – (Kritisches) ***Urteilsvermögen*** gegenüber den Medien ist jetzt sehr wichtig.

Violations of rights are forbidden. (26) – ***Verletzungen*** der Rechte sind verboten.

What would **loss of access** mean to you? (27- 28) – Was bedeutet der ***Verlust des Zuganges*** für Sie?

Do you agree with ***judicious*** parental supervision (29**) –** Sind Sie mit einer ***vernünftigen*** Aufsicht durch die Eltern einverstanden?

There will be a lot of ***drivel.*** **(30) –** Da kommt viel ***Geschwafel*** heraus.

The opportunities to ***delight*** myself. (31) – Die Gelegenheiten, mich selbst zu ***erfreuen***.

He ***outlines*** his plans. (32). – Er ***umreißt*** seine Pläne.

He is not ***content*** with becoming the dominant search machine. (33) – Er ist nicht damit ***zufrieden***, die marktbeherrschende Suchmaschine zu werden.

He ***reveals*** that he ***requires*** information about his users. (34-35) – Er ***enthüllt***, dass er Informationen über seine Benutzer ***anfordert / benötigt***.

This is a terrifying ***prospect***. (36) – Das ist eine erschreckende ***Aussicht***.

There is no ***innocent*** use. (37) – Es gibt keinen ***unschuldigen*** Gebrauch.

I read a ***proper*** book. (38) – Ich lese ein ***wirkliches*** Buch.

This is a ***staggering*** new book (39) - Das ist ein ***umwerfend*** neues Buch.

He is an ***entrepreneur*** **(40) –** Er ist ***Unternehmer***.

He ***unleashes*** the dangers (41) – Er ***entfesselt*** Gefahren.

We concentrate on his ***assertion***. (42) – Wir konzentrieren uns auf seine ***Aussage***.

It ***blurred*** the distinction between true and false. (43) - Es ***verwischte*** die Unterschiede zwischen Wahr und Falsch.

Wikipedia is now ***insidiously crammed*** with misinformation, (44-45) - Wikipedia ist jetzt ***schleichend*** mit Fehlinformationen ***vollgestopft*** worden,

planted by **malign** individuals with ***axes*** to ***grind***. (46-48) – gepflanzt von ***böswilligen*** Individuen mit ***Äxten***, die noch ***zu schleifen*** sind.

How do you ***conduct*** your life? (49) – Wie ***führen*** Sie Ihr Leben?

Wikipedia is often ***biased.*** (50) **–** Wikipedia ist oft ***voreingenommen***.

It is deeply ***flawed.*** (51) **–** Es ist zu tiefst ***fehlerhaft***.

It ***purported*** to be correct. (52) – Es ***gab vor***, genau zu sein.

Strict ***accuracy*** is ranked 5.000. (53) – Strenge ***Genauigkeit*** wird auf 5.000 eingestuft.

It does'nt pay for its ***contributions***. (54) – Es (Wikipedia) bezahlt nicht für seine ***Beiträge***.

We need more ***participatory*** media (1) - Wir brauchen mehr Medien mit ***Mitwirkungsmöglichkeit.***

We have to ***compete from*** the 1950s ***onward*** **(2-3)-** Wir müssen ***seit*** den 50er Jahren ***konkurrieren***.

They ***remained*** the property of ***broadcasting corporations*** **(4-6)-** Sie ***blieben*** im Eigentum der ***Rundfunkanstalten.***

We finance ourselves by advertising ***revenue*** **(7)-** Wir finanzieren uns durch Werbe***einnahmen***.

We sell ***broadcasting time*** for commercials **(8) –** Wir verkaufen ***Sendezeit*** für Werbespots.

They ***exert*** influence on the ***content*** **(9-10) –** Sie ***üben*** Einfluss auf den ***Inhalt aus***.

We ***appeal*** to certain target groups. **(11) –** Wir ***richten*** uns ***an*** bestimmte Zielgruppen.

The ***reduced*** content can be ***stored***. (12- 13) – Der ***verkürzte*** Inhalt kann ***gespeichert*** werden.

We have new forms of ***dissemination*** **(14) –** Wir haben neue Arten der ***Verbreitung.***

The internet ***access*** *has* ***spread*** *by* ***file sharing*** **(15-18) –** Der Internet- ***Zugang*** hat sich durch ***gemeinsame Akteneinsicht verbreitet.***

Dangers are resulting from ***invasion*** *of* ***privacy*****, (19-20)** – Gefahren entstehen durch das ***Eindringen in die Privatsphäre***,

and from copy right ***infringement*** **(21) –** und durch die ***Verletzung*** des Urheberrechtes

and it ***constitutes*** a revolution. (22) – und ***stellt*** eine Revolution ***dar.***

The prophecies are ***exaggerated***. (23) – Diese Prophezeiungen sind ***übertrieben***.

This is a ***media hype***. (24) – Das ist ein ***Medienrummel***.

Media ***literacy*** is now very important. (25) – (Kritisches) ***Urteilsvermögen*** gegenüber den Medien ist jetzt sehr wichtig.

Violations of rights are forbidden. (26) – ***Verletzungen*** der Rechte sind verboten.

What does **loss of access** mean to you? (27- 28) – Was bedeutet der ***Verlust des Zuganges*** für Sie?

Do you agree with ***judicious*** parental supervision (29**) –** Sind Sie mit einer ***vernünftigen*** Aufsicht durch die Eltern einverstanden?

There will be a lot of ***drivel.*** **(30) –** Da kommt viel ***Geschwafel*** heraus.

The opportunities to ***delight*** myself. (31) – Die Gelegenheiten, mich selbst zu ***erfreuen***.

He ***outlines*** his plans. (32). – Er ***umreißt*** seine Pläne.

He is not ***content*** with becoming the dominant search machine. (33) – Er ist nicht damit ***zufrieden***, die marktbeherrschende Suchmaschine zu werden.

He ***reveals*** that he ***requires*** information about his users. (34-35) –

Er ***enthüllt***, dass er Informationen über seine Benutzer ***anfordert / benötigt***.

This is a terrifying ***prospect***. (36) – Das ist eine erschreckende ***Aussicht***.

There is no ***innocent*** use. (37) – Es gibt keinen ***unschuldigen*** Gebrauch.

I read a ***proper*** book. (38) – Ich lese ein ***wirkliches*** Buch.

This is a ***staggering*** new book (39) - Das ist ein ***umwerfend*** neues Buch.

He is an ***entrepreneur*** **(40) –** Er ist ***Unternehmer***.

He ***unleashes*** the dangers (41) – Er ***entfesselt*** Gefahren.

We concentrate on his ***assertion***. (42) – Wir konzentrieren uns auf seine ***Aussage***.

It ***blurred*** the distinction between true and false. (43) - Es ***verwischte*** die Unterschiede zwischen Wahr und Falsch.

Wikipedia is now ***insidiously crammed*** with misinformation, (44-45) - Wikipedia ist jetzt ***schleichend*** mit Fehlinformationen ***vollgestopft*** worden,

planted by **malign** individuals with ***axes*** to ***grind***. (46-48) – gepflanzt von ***böswilligen*** Individuen mit ***Äxten***, die noch ***zu schleifen*** sind.

How do you ***conduct*** your life? (49) – Wie ***führen*** Sie Ihr Leben?

Wikipedia is often ***biased.*** (50) **–** Wikipedia ist oft ***voreingenommen***.

It is deeply ***flawed.*** (51) **–** Es ist zu tiefst ***fehlerhaft***.

It ***purported*** to be correct. (52) – Es ***gab vor***, genau zu sein.

Strict ***accuracy*** is ranked 5.000. (53) – Strenge ***Genauigkeit*** wird auf 5.000 eingestuft.

It does'nt pay for its ***contributions***. (54) – Es (Wikipedia) bezahlt nicht für seine ***Beiträge***.

2.3. First Hypothesis: With "Triple Coding" the Students Achieve a Retention of 70% of the 54 Learning Words in Short-Term Memory

Description of Experimental Hour and the Two Short-Term Tests

Based on the studies with French-beginners in six French classes (Schiffler 2012 131-150) one could assume that the English class would achieve similar results. The conditions, however, were for the advanced English class far more difficult on account of the rare expressions. The French classes were beginners and had to learn everyday vocabulary.

In the first five minutes of the experimental 45-minute lesson the teacher pointed to neuropsychological findings substantiate the effectiveness of triple coding. In the remaining 40 minutes, the 54 words were learned in the three described phases. The following hour was available for controlling, which showed that the students were able to translate on average 40.5 of the 54 words (75%) into English. The first hypothesis was thus confirmed.

2.4. Second Hypothesis:

The long-term retention improves, by actively reading along with intrinsic repetition of learning words. Two weeks later, the students studied the two texts, from which the words had been taken. In order to determine the whether the active studying of the two texts has led to an increase of retention of the learning words; a month after the experimental session, a controlled session was conducted. Students were given the identical test.

This first long-term test revealed that the students were able to reproduce from the only 39.95 (74%) of the learning vocabulary out of the total 54 learning words.

The result after the experimental lesson with triple coding was therefore not outbid, but rather below. The unsystematic studying of the two texts has therefore, not led to an increase of new vocabulary. Of course, one can assume that the previously learned words with triple coding were partly strengthened through reading.

The second hypothesis that the long-term retention would be improved by studying the two texts, could not be confirmed. This is reminiscent of the finding of Meara (1997, 121): "Either way, it suggests that in our search for evidence that working with texts improved vocabulary knowledge, we have all been looking for the wrong thing, with the wrong tools, and in the wrong place. "

2.5. Third Hypothesis:

By repeating with "triple coding" with the mind maps variant long-term memory is improved.

Description of the Procedure:

Because for the promotion of the long-term memory, a systematic repetition at a later stage is essential, a 30 minute short repetition with only two phases, with movement and helping partners work, took place three month later. The learning control, immediately after this repetition, showed that the students increased their short-term retention significantly. They had retained 46.08 (85 %) words.
After this learning control with high result, the students were given a lesson time to draw three mind maps on their own with the learning words divided in three parts according to three subjects. Due to the long-term studies of Neveling (2004, 270), a retention of approximately 48% could be expected. At the end of the lesson, the word lists and all mind maps were collected, so that the students did not have the opportunity to repeat the vocabulary based on written records.

2.6. The Review of the Third Hypothesis after 4 and 10 Months

A month after this repetition or four months after the experimental lesson, as usual unannounced, the second long-term memory test took place. It showed that the students were able to translate 45,5 (84 %) of the learning words into English. This indicates that the long-term retention has been significantly enforced by the repetition with the two phases learning with movement and helping partner work and the variant with mind maps. The result surpassed even the result of the short-term memory after the first experimental hour.

The third long-term study by ten months (seven months after the repetitive learning) showed that the students were able to retain 39.75 (74%) learning words. The positive impact of a repetition after 3 months with the option of triple coding with mind maps, which could be detected in the second long-term study, could be confirmed. Students had after 10 months (seven months after the repetitive learning) an average of only 1% of the forgetting what they had learned in the experimental hour.

2.7. The Check-Up Based on Nine Rare Learning Words.

This result was so surprising that it encouraged the author to conduct another memory-recall test. The English class teacher observed that during the ten months, student had not been exposed to some of the new vocabulary in class before and thus the good result could not have influenced the test. To exclude this possibility, nine rare words were selected from the learning words that had not occurred in the classroom, in the opinion of the teacher. These words were "judicious, unleash, blurred, staggering, insidiously, malign, grind, biased, purport" Coincidentally the only two out of the nine words had Latin roots. For the additional test, the results of all conducted tests were evaluated again on concentrating on these nine words. The result was even more surprising than the previous. In all review these nine words were better reproduced than the other learning words. The test after four months proved a retention of 87% compared to 84% for all of the learning words. Only after 10 months, the results were reduced to 66% compared to 74% in all learning words. The good long-term retention is, therefore, due to triple coding and not to a random repetition in the classroom. Furthermore, it is not primarily due to the knowledge of Latin, because only two words had a Latin-root.

2.8. Table with the Results of the Two Test of the Short-Time Memory and the Three Tests of the Long-Term Memory

Class 10 5 years English 5 years Latin 24 students	Short-term memory after the first learning-lesson	**1.test of the long-time memory after one month**	Short-term memory after the repetition of the learning with movement and helping pair-work 3month later	Followed by the drawing of 3 mind maps without test to the same moment	**2.test of the long-time memory after four months** (1 month after the repetition 3 months later)	**3.test oft the long-time memory after ten months** (7 months After the re-petition 3 months later)
Names of all students	**Learning of the 54 learning words with movement, relaxation and helping partner-work** (40 minutes)	Test after studying the two texts, containing the 54 learning words.	**Short-time memory** of the 54 learning words after re-petition of learning with movement and helping partner-work	Drawing the three mind maps during 45 minutes without test.		
L. P.	**23**	**24**	**36**	**34**	**26**	
L. M.	**16**	**46**	**40**	**38**	**37**	
R. S.	**34**	**28**	**43**	**46**	**42**	
T. G.	**42**	**40**	**53**	**51**	**39**	
F. G.	**51**	**52**	**53**	**53**	**48**	
M. M.	**30**	**29**	**44**	**46**	**41**	
S. S.	**41**	**35**	**43**	**43**	**44**	
F. B.	**40**	**22**	**43**	**36**	**27**	
K. O.	**34**	**44**	**47**	**48**	**29**	
H. B.	**46**	**37**	**47**	**47**	**40**	
C. D.	**29**	**24**	**32**	**36**	**24**	
C. S.	**29**	**31**	**49**	**48**	**24**	
F. S.	**54**	**51**	**54**	**54**	**49**	
A.B.	**47**	**52**	**50**	**50**	**44**	
C. R.	**44**	**44**	**53**	**52**	**50**	
N. G.	**54**	**54**	**54**	**54**	**54**	
Y. G.	**54**	**52**	**54**	**54**	**53**	
B. J.	**50**	**46**	**54**	**54**	**44**	
N. B.	**36**	**29**	**37**	**36**	**26**	
W. W.	**49**	**45**	**48**	**44**	**44**	
J. B.	**41**	**48**	**41**	**38**	**38**	
L. K.	**30**	**26**	**30**	**24**	**31**	
J. W.	**50**	**50**	**54**	**54**	**52**	
J. H.	**50**	**50**	**47**	**52**	**48**	
Average	**40,58**	**39,95**	**46,08**	**45,50**	**39,75**	
Exact translation into English	**75 %**	**74 %**	**85 %**	**84 %**	**74 %**	
9 rare learning-words	**85 %**	**88 %**	**99 %**	**87 %**	**66 %**	

3. Interpretation of Results:

Triple coding seems to improve both short-term memory, and long-term memory, provided that it is used repeatedly after three months. It cannot be known whether this result would have been just as positive when this repetition would have been the same, without the mind maps variant. The short-term memory, immediately after the repetition with only two phases of triple coding (movement and helping partners work) with a memory of 85% supports this assumption.

Nor can it be concluded that the positive result is mainly due to the drawing of three mind maps. In any case, the students had an entire lesson available for the drawing, that means 45 minutes more than if only the triple coding would have been repeated identical. However, the result is consistent with the hypothesis that a repetition with a variant has favorable synenergetic effect.

Finally, it can be concluded that a good long-term memory is not obtained by the study of a text, but rather by learning with triple coding and by an identical repetition or a repetition with a variant. To let the students learn by their own do not lead the same results. But if one or two of the proposed three phases of triple coding would be used regularly, a step for a better retention would be achieved.

4. Interpretation of the Results According to the Learning Aids

The learning aids given by the teacher seem to have played significant role in this experiment. To determine this, it was tested (through a controlled test) how often the nine words were retained by the subjects that students had not been exposed to in the later lessons. The best result, remembered by all students in all tests, was the word “to grind”. During the relaxation phase, the students should visualize the contextual vocabulary mentally. The good long-term memory of this word is probably due to the intuitive mental visualization of the Ls, which ran as follows: "The word [tu: graind] is like the writing of the German word "Grind”. [Tu: graind an æks]. If you have a wound, then “Grind” (crust) will be formed and you can grind the crust as you grind an ax ".

Furthermore, there was the word “to unleash” been kept from all but one student; the teacher visualized the word with his context as follows: “You are leading a dog on a leash - You keep the dog on leash. Then you let him off the leash going - You unleash the dog. He unleashes dangers - He unleashed threats ". Further evidence can be given by the opposite. The least retained word, remembered by only five of 25 students, was the word “to purport”. Student had to learn this word without any learning help, because the teacher had found neither a matching movement

nor a Latin root. The unproven Latin root * proportare could not be uses as a learning aid.

Reference

1. Atkinson, Richard & Raugh, Michael (1975), An Application of the Mnemonic Keyword Method to the Acquisition of a Russian Vocabulary. In: Journal of Experimental Psychology: Human Learning and Memory. Oxford: Clarendon.
2. Boers, Frank & Lindstromberg, Seth (2008), How cognitive linguistics can further effective vocabulary teaching. In: Boers, Frank & Lindstromberg, Seth (2008), Cognitive Linguistic Approaches to Teaching Vocabulary and Phraseology. Berlin, N. Y.: Mouton de Gruyter, 1-64.
3. Butzkamm, Wolfgang (22007). Lust zum Lehren, Lust zum Lernen. Eine neue Methodik für den Fremdsprachenunterricht. Tübingen und Basel.
4. Hattie, John. (2009), Visible Learning. A synthesis of over 800 meta-analyses relating to achievement. London & New York: Routeledge.
5. Hille, Katrin u. a. (2010), Szenischer Lernen im Fremdsprachenunterricht – Die Evaluation eines Schulversuchs. In: Diskurs Kindheits- und Jugendforschung, 3, 337– 350.
6. Lozanov, Georgi. (1978), Suggestology and Outlines of Suggestopedy. London: Gordon & Breach, Science Publisher.
7. Meara, Paul (1997), Towards a New Approach to Modelling Vocabulary Acquisition. In. Schmitt, Norbert (1997) & McCarthy, Michael, Vocabulary: Description, Acquisition and Pedagogy, Cambridge: Cambridge University Press, 109-121.
8. Milton; James (2009), Measuring Second Language Vocabulary Acquisition, Bristol: Multilingual Matters.
9. Nation, I. S. Paul (1982), Beginning to Learn a Foreign Vocabulary, A Review of the Research. In: RELC Journal, 13, 1, 14-36.
10. Neveling, Christiane. (2004), Wörterlernen mit Wörternetzen – Eine Untersuchung zu Wörternetzen als Strategie und als Forschungsverfahren. Tübingen: Gunter Narr.
11. Paivio, Allan. (1986), Mental representations: a dual coding approach. In: Canadian Journal of Psychology (1), 17– 27.
12. Rizolatti, Giacomo & Craighero, Laila & Fadiga, Luciano (2003), The mirror system in the humans. In: Stamenov, Maxim & Gallese, Vittori (Hrsg.) (2003), Mirror neurons and the evolution of brain and language, Amsterdam: John Benjamins Publisher, 37– 59.
13. Rück, Heribert (1998), Eine neue Sprache lernen – wie geht das? Bekenntnisse eines romanistischen Russischlerners. In: Praxis des neusprachlichen Unterrichts (4), 345– 346.
14. Sambanis, Michaela (2007), Sprache aus Handeln. Englisch und Französisch in der Grundschule, Landau: Landauer Schriften zur Kommunikations- und Kulturwissenschaften.
15. Sambanis, Michaela & Speck, Alexandra (2010), Lernen in Bewegung: Effekte bewegungsgestützter Wortschatzarbeit auf der Primarstufe. In: Französisch heute (3), 111– 115.
16. Sambanis, Michaela (2011), Weniger stillsitzen, mehr lernen? Effekte bewegungsbasierter Wortschatzarbeit in der Primar- und Sekundarstufe. In: Schäfer, P. & Schowalter, Ch. (Hrsg.) (2011), In mediam linguam. Mediensprache – Redewendungen – Sprachvermittlung, Landau: Landauer Schriften zur Kommunikations- und Kulturwissenschaften, 365-376.
17. Schiffler, Ludger (1980), Interaktiver Fremdsprachenunterricht, Stuttgart: Ernst Klett.
18. Schiffler, Ludger (1988), Hypermnesie im Fremdsprachenunterricht – Kann man 500 Vokabeln in 3 und 1000 in 5 ½ Stunden lernen? In: Neusprachliche Mitteilungen (3), 150– 157.
19. Schiffler, Ludger (1989), Suggestopädie und Superlearning – empirisch geprüft, Frankfurt am Main: Moritz Diesterweg.
20. Schiffler, Ludger. (1992), Suggestopedic Methods and Applications. Philadelphia: Gordon and Breach, Science Publisher.
21. Schiffler, Ludger (2012), Effektiver Fremdsprachenunterricht – Bewegung – Visualisierung – Entspannung. Tübingen: Narr.
22. Schmitt, Norbert & McCarthy (1997), Vocabulary: Description, Acquisition and Pedagogy. Cambridge: Cambridge University Press.
23. Stock, Antje (2003), Vokabellernen – Eine Untersuchung zur Effizienz von Vokabellernstrategien. Tübingen: Gunter Narr.
24. Zimmermann, Günther (1977), Anmerkungen zu einem Strategienkonzept. In: Rampillion, Ute & Zimmermann, Günther (Hrsg.), (1977), Strategien und Techniken beim Erwerb fremder Sprachen. Ismaning: Hueber, 95-113.
25. Atkinson, Richard & Raugh, Michael (1975), An Application of the Mnemonic Keyword Method to the Acquisition of a Russian Vocabulary. In: Journal of Experimental Psychology: Human Learning and Memory. Oxford: Clarendon.
26. Boers, Frank & Lindstromberg, Seth (2008), How cognitive linguistics can further effective vocabulary teaching. In: Boers, Frank & Lindstromberg, Seth (2008), Cognitive Linguistic Approaches to Teaching Vocabulary and Phraseology. Berlin, N. Y.: Mouton de Gruyter, 1-64.
27. Butzkamm, Wolfgang (22007). Lust zum Lehren, Lust zum Lernen. Eine neue Methodik für den Fremdsprachenunterricht. Tübingen und Basel.
28. Hattie, John. (2009), Visible Learning. A synthesis of over 800 meta-analyses relating to achievement. London & New York: Routeledge.
29. Hille, Katrin u. a. (2010), Szenischer Lernen im Fremdsprachenunterricht – Die Evaluation eines Schulversuchs. In: Diskurs Kindheits- und Jugendforschung, 3, 337– 350.
30. Lozanov, Georgi. (1978), Suggestology and Outlines of Suggestopedy. London: Gordon & Breach, Science Publisher.
31. Meara, Paul (1997), Towards a New Approach to Modelling Vocabulary Acquisition. In. Schmitt, Norbert (1997) & McCarthy, Michael, Vocabulary: Description, Acquisition and Pedagogy, Cambridge: Cambridge University Press, 109-121.
32. Milton; James (2009), Measuring Second Language Vocabulary Acquisition, Bristol: Multilingual Matters.
33. Nation, I. S. Paul (1982), Beginning to Learn a Foreign Vocabulary, A Review of the Research. In: RELC Journal, 13, 1, 14-36.
34. Neveling, Christiane. (2004), Wörterlernen mit Wörternetzen – Eine Untersuchung zu Wörternetzen als Strategie und als Forschungsverfahren. Tübingen: Gunter Narr.
35. Paivio, Allan. (1986), Mental representations: a dual coding approach. In: Canadian Journal of Psychology (1), 17– 27.
36. Rizolatti, Giacomo & Craighero, Laila & Fadiga, Luciano (2003), The mirror system in the humans. In: Stamenov, Maxim & Gallese, Vittori (Hrsg.) (2003), Mirror neurons and the evolution of brain and language, Amsterdam: John Benjamins Publisher, 37– 59.
37. Rück, Heribert (1998), Eine neue Sprache lernen – wie geht das? Bekenntnisse eines romanistischen Russischlerners. In: Praxis des neusprachlichen Unterrichts (4), 345– 346.
38. Sambanis, Michaela (2007), Sprache aus Handeln. Englisch und Französisch in der Grundschule, Landau: Landauer Schriften zur Kommunikations- und Kulturwissenschaften.
39. Sambanis, Michaela & Speck, Alexandra (2010), Lernen in Bewegung: Effekte bewegungsgestützter Wortschatzarbeit auf der Primarstufe. In: Französisch heute (3), 111– 115.

40. Sambanis, Michaela (2011), Weniger stillsitzen, mehr lernen? Effekte bewegungsbasierter Wortschatzarbeit in der Primar- und Sekundarstufe. In: Schäfer, P. & Schowalter, Ch. (Hrsg.) (2011), In mediam linguam. Mediensprache – Redewendungen – Sprachvermittlung, Landau: Landauer Schriften zur Kommunikations- und Kulturwissenschaften, 365-376.

41. Schiffler, Ludger (1980), Interaktiver Fremdsprachenunterricht, Stuttgart: Ernst Klett.
42. Schiffler, Ludger (1988), Hypermnesie im Fremdsprachenunterricht – Kann man 500 Vokabeln in 3 und 1000 in 5 ½ Stunden lernen? In: Neusprachliche Mitteilungen (3), 150– 157.

43. Schiffler, Ludger (1989), Suggestopädie und Superlearning – empirisch geprüft, Frankfurt am Main: Moritz Diesterweg.

44. Schiffler, Ludger. (1992), Suggestopedic Methods and Applications. Philadelphia: Gordon and Breach, Science Publisher.

45. Schiffler, Ludger (2012), Effektiver Fremdsprachenunterricht – Bewegung – Visualisierung – Entspannung. Tübingen: Narr.

46. Schmitt, Norbert & McCarthy (1997), Vocabulary: Description, Acquisition and Pedagogy. Cambridge: Cambridge University Press.

47. Stock, Antje (2003), Vokabellernen – Eine Untersuchung zur Effizienz von Vokabellernstrategien. Tübingen: Gunter Narr.

48. Zimmermann, Günther (1977), Anmerkungen zu einem Strategienkonzept. In: Rampillion, Ute & Zimmermann, Günther (Hrsg.), (1977), Strategien und Techniken beim Erwerb fremder Sprachen. Ismaning: Hueber, 95-113.