

AN INTERDISCIPLINARY APPROACH ON BUILDING KNOWLEDGE CONSOLIDATION ROUTINE IN LSP TEACHING - A CASE STUDY ON ECONOMICS STUDENTS IN ROMANIA

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Abstract

Considering the constant concern expressed by worldwide policy makers and regulatory bodies in the education sector for the need to adjust learners' knowledge, skills and competencies in an attempt to meet the 21st century challenges, one could no longer consider learning effective unless it is voluntary, self-motivated and a lifelong practice. For a long time now, teaching has gone beyond the bare conveyance of information, with the educators permanently striving to apply modern teaching methods and strategies, to ensure relevant and sensitive content, to not overlook students' learning profile and to include relevant global social issues in all their teaching. This paper researches and presents a case study showing relevant data on students' individual consolidation habits in terms of: students' motivation to continuous self-improvement, frequency of self-study activities, preferred method/activity and desire to improve, against the author's endeavour to raise students' awareness of the importance of building self-study habits. The paper foregrounds the exploitation of conceptual and applied methods in LSP teaching, with the purpose of enhancing students' predilections towards individual consolidation of newly-acquired knowledge. The beneficiary target group consists of first-year Economics students from the Bucharest University of Economic Studies - ASE, Romania, majoring in Management and Finance and Banking.

Keywords: engagement, knowledge consolidation, lifelong learning, memory, cognitive mechanisms

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1. Introduction

Building 21st century skills has been among the main purposes of education, especially of higher education, whose major concern is meeting the requirements on the labour market. The 21st century is known to be the age of information, impacted by the advent of breakthrough technologies and a galloping development of science. In such a technology and digital devices-driven society, access to information is no longer an issue, while finding suitable means to turn this easily accessible

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information into knowledge and further consolidate and exploit the newly acquired knowledge could be a matter of concern. Even though knowledge acquisition occurs on a daily basis since “the world is a teacher and, so is the classroom – with or without a teacher” (Jensen, 2005: 147), very little of this knowledge is to be retained on a long-term basis. Besides conveying relevant and updated content, teachers, as the representative actors of educational institutions, have to assume one more responsibility, i.e. including in their teaching process suitable means for assisting students “self-regulate their learning to remain fully participating members of society”. (Endres et.al., 2020). For fruitfully exploiting and putting into practice the information they can nowadays find so conveniently, students need to turn it into knowledge, and then reinforce and refine the understanding of that knowledge, namely, store it into their-long-term memory.

Trying to understand learning in terms of its cognitive mechanisms, we come to realize that everything we find out for the first time means information accessible only temporarily, subject to a limited storage time in our short-term memory (Cowan, 2008). The brain level dealing with processing novel information is the working memory, “which implies a combination of storage and manipulation” (Baddeley, 2012). Both “simple verbal working memory”, that is “the retention of orally presented information” (what actually happens in an ESP seminar), as well as “complex working memory” whose function is to “remember and manipulate information” play an important role “in the developmental outcomes, is fundamental to learning, and predicts academic attainment” (Berry et al., 2019: 3). Studies developed so far point out the two main features of both short-term and working memory, i.e. the limits of capacity and time length, which is actually estimated to only 30 seconds, unless the information is refreshed and rehearsed (Waterman and Miller, 2008). Moreover, distraction and interferences are significant threats, likely to intercept our ability to remember a certain chunk of information stored in our working memory. Information retained in the working memory is easily passed into long-term memory by means of rehearsing and refreshing, where it is stored over lengthy time periods, it is linked “into pre-existing structures”, and thus becomes related information (Waterman and Miller, 2008). For completing most tasks during the class and/or formal or informal examination, this related information needs to be brought back into the working memory, still the process is easier and quicker than remembering separate items of newly acquired information, directly from the short-term or working memory.

Relating these cognitive mechanisms to FL learning, here including ESP, as our field of interest in this study, all new lexical items, encountered either accidentally or under a teacher’s guidance, occasion an incidental experience for the learners’ brains. Unless the new lexical acquisitions go deeper into learners’ long-term memory, they will be hardly used efficiently and appropriately in new and personal contexts. “Behavioural studies have shown that, after a period of consolidation, new words

start to function like existing words and thus appear to be integrated into the lexicon at both the form and meaning levels.” (Tartaro et al., 2021: 865).

By compiling the research performed on an interdisciplinary level, we can enjoy at present numerous ways of helping learners during the class, either by having them improve their working memory capacity, or by wisely managing the teaching and practicing strategies and activities, such as task adaptation, clarity of instructions, relating the students’ knowledge to the topic approached, encouraging students to ask questions and so on. However, considering the individuals’ needs of training themselves for lifelong learning, I strongly believe that raising students’ awareness of the need to consolidate their knowledge and encouraging them to take advantage of their long-term memory capacity are the moral and professional duties of 21st century teachers.

2. Learning for the sake of learning

The current section is divided into two parts, each highlighting the importance of individual, regular consolidation of newly acquired knowledge, both from the teacher’s and the students’ perspectives. The first part depicts the range of both theoretical and non-theoretical strategies, activities and resources I availed myself of in an attempt to promote positive learning engagement among the 1st year economics students from the Bucharest University of Economic Studies-ASE, Romania. The next part includes the qualitative research consisting in open-question interviews conducted among students in order to find out pertinent attitudes and routines likely to help the teacher in adjusting and identifying new strategies of encouraging students to dedicate time to self-study on a regular basis. The time frame covered by my study extends over the 2022-2023 academic year and the students representing the target group thereof are majoring in Management and Finance and Banking, studying Business English as a compulsory subject in their curriculum. My empirical observation, considerable for some years now, of the lack of students’ inner motivation and self-driven involvement in the learning process, stands as a righteous justification for my endeavour. Under the umbrella of vast recent research done in the field of FL teaching, there are still few studies focusing on building effective long-term study habits among Bachelors as a practical method for increasing their self-motivation and long-life desire to continually improve a particular subject, ESP in our case.

2.1 Building students’ consolidation habits

Uninteresting topics, excessive information to be learned by heart, difficult classwork and assignments which usually discourage students to proceed any further, unclear instructions are just a few among the most often encountered reasons students claim in order to justify their inner disengagement with learning.

Occasioned by the wide array of written, audio and/or video materials used at ESP seminars, the student-student and/or teacher-student(s) debates on motivation have revealed that most students would focus on academic performance rather than individual achievement: the environment they have been brought up in, their parents' demands, the urge for always being the winner in any competition, all these have shaped their beliefs that the importance of grades and their influence is indisputable. Primary, secondary and high-school students are ranked according to their grades, and these are often the deciding factor regarding the granting or non-granting of diplomas or even rewards, so instead of acting as a motivational factor, grades have the reverse effect.

Definitely, having good academic results is not a purpose to be neglected by students, it is only to be complemented by stimulating a mindful interest in learning. According to some research in the field, learning for the sake of grades is not a sustainable form of motivation:

Rather than motivating students to learn, grading appears to, in many ways, have quite the opposite effect. Perhaps at best, grading motivates high-achieving students to continue getting high grades—regardless of whether that goal also happens to overlap with learning. At worst, grading lowers interest in learning and enhances anxiety and extrinsic motivation, especially among those students who are struggling. (Schinske and Tanner, 2014: 162).

Seeking to comply with the so popular suggestion to think out of the box, I felt an interdisciplinary approach of these demotivating factors would generate a better outcome. Besides constantly seeking breakthrough teaching strategies, revising the grading scheme and empowering students by means of self and peer assessment, encouraging students to understand learning scientifically and to adopt a growth mindset was the ultimate purpose during each and every ESP seminar.

As claimed and proven by latest researchers in neuroscience, an obvious contribution of the Science of learning, a broad term whose meaning is closely related to some others - “neuroeducation”, “educational neuroscience”, “mind, brain and education” – is to show that “an understanding of mechanisms of learning may help improve some learning outcomes”. (Thomas and Ansari, 2020:3). In an attempt to translate educational neuroscience into practices to be applied in an ESP seminar, (1) engaging the learner, (2) building knowledge and understanding and (3) consolidating learning are thought to be three interdependent stages of teaching that positively impact learners' attitude towards learning. (Howard et.al., 2018). These 3 categories are not to be understood as a standard 3-part lesson, they are to be seen as parts occurring simultaneously in every kind of teaching and learning. An activity designed to be implemented at the beginning at the class, could cover all the three stages: engage students due to the uniqueness and novelty of the topic, introduce a few lexical forms (so build stem) but also consolidate the previously learnt vocabulary. A suggestion I

could share from my personal experience while trying to follow the three-part model is that one should never overlook engagement at any moment during the class.

2.1.1 Student engagement – a many-sided part of teaching

Engagement and disengagement influence in both positive and negative ways the cortical mechanisms involved in cognition (Howard et. al., 2018). Besides the cognitive impact it has, engagement also generates emotionally and behaviourally related outcomes: seeing the activity as personally meaningful means an internally driven active participation in the class. Moreover, the nice memories occasioned by students' engagement can lead to easy and fast learning and they help to build self-study habits by constantly rehearsing and consolidating. The stronger such associations are, the weaker the limitations of the semantic memory will be. A first step towards achieving students' engagement is creating a connection or rapport with them, while introducing the topic, delivering the tasks and more especially while suggesting ways for further documentation, practice and individual consolidation.

We all know students are extremely different, they have different personalities, and they show interest in different topics. One seemingly easy way to handle this issue would be conducting a survey in order to find out their fields of interest and consequently choose some common topics. Still, such surveys were not very helpful in my case, since they revealed an extremely wide variety of interests, with few common ones. Following Hedlung's suggestion (Hedlung, 2020), a brief quiz about the teacher, gamifying the tasks rather than simply delivering them as such, creating an element of surprise, making a personal-life-experience connection with the topics to be approached, all have proved efficient in arousing curiosity and interest and encouraging students to speak freely, once they feel their learning environment is a safe one. Another highly useful means and equally appropriate for undergraduates are pre-testing students before engaging with new knowledge in order to make them more aware of what is going to be presented and to have them work their memory and how to approach what they do not know already.

Last but not least, talking about metacognition and making students aware of brain plasticity proves to be highly effective in engaging and motivating students, offering them a grounded reason why learning should become a personal, lifelong target. Introducing brain facts at certain times at ESP seminars is a handy tactic in helping develop a so-called growth rather than fixed mindset and draw their attention to the importance of setting learning goals for their personal benefit not only for complying with exam requirements.

2.1.2 Building new knowledge

New knowledge is to be built on prior knowledge already stored in long-term memory, to ensure an easier retrieval of familiar information into working memory, ease in dealing with current tasks, as well as more efficient learning outcomes (Waterman and Miller, 2008). In pedagogical terms, building knowledge and understanding usually includes 4 well-known steps: lead-in – helping students connect to their previously acquired knowledge and think about what they are going to learn, noticing and deducing, followed by more controlled practice and later by freer practice types of activities of the newly acquired issues.

A good tactic when building knowledge and understanding consists in helping students to make connections to prior knowledge, by different means, such as different types of formative assessment activities in our case. Students' understanding of specific vocabulary, for example, is significant before building new vocabulary. The more appropriate the amount of the new information transmitted is, the better the retention in the working memory. Unlike graded assessments and assignments, whose role is summative, formative assessment helps us understand whether the students have the necessary framework to comprehend and retain further information. A previous paper on the phygitalization of FL teaching, i.e. the process of embedding digital devices within the teaching process, (Chitu and Moraru, 2023) shows students' preferences for computer-based formative assessment tasks. Usually run on a weekly basis, it has been revealed that formative assessment tasks' efficiency is also influenced by the manner in which and the part of lesson when they are delivered.

At the same time, students should be “encouraged to make connections between the new information and their existing knowledge. As well as learning new information, a student must also learn how to apply it. Applying new information requires using prior knowledge to transform, organize and elaborate the new input”. (Howard et.al., 2018) The scientific explanation of learning has proven that the more learners use their knowledge, the more likely it becomes to be used automatically, “increasing involvement of basal ganglia and cerebellar structures and decreasing involvement of prefrontal cortex”. (Thomas and Ansari, 2020: 9) In contrast, the less often skills or knowledge are used, the more likely they are to be lost. To a certain extent, engaging the learner as well as building knowledge and understanding fall entirely under the teacher's responsibility, still consolidating learning is to be differently approached, at least in terms of whose responsibility it is.

2.1.3 Turning new knowledge into prior knowledge

Transferring information from the working memory into the long-term memory makes “our precious brain resources available for other purposes.” (Dehaene, 2020: 424) Consolidated knowledge is more effortlessly recalled and exploited than freshly learnt knowledge, and besides advantages such as less conscious effort, quicker reaction times, more logical answers and improved performance, it ensures more free

space in the working memory for further knowledge to be stored until it is consolidated. Once stored in long-term memory, consolidated knowledge becomes permanent (Howard et.al., 2018), and automatically accessible (Hedlung, 2020).

“Learners will develop their recall of the learned material more in the first hour after learning than in the next few days” (Jensen, 2005: 148), so the teacher still plays an important role in the process of consolidation, by providing “engaging opportunities that challenge students to apply and test their knowledge in low-risk tasks that are free of anxiety (unlike exams or formal assessments)” (Howard et.al., 2018). Usually conceived as an end-of-class activity, consolidation concentrates both learning that has occurred during that current class as well as learning that has occurred on multiple occasions in the previous classes. The major teaching goals of consolidation are identifying and addressing any learning gaps. More often than not, consolidation serves at showing students how seemingly separate goals of a lesson are finally related to one another. When practiced in the class, consolidation inherently includes a wide range of activities: questioning, multiple-choice activities, feedback, error feedback, scaffolding, revision, quizzes, cued retrieval, formative and summative assessment. Setting up a frequency considered necessary, according to the difficulty of the information as well as to students’ learning profile, helps to obtain better outcomes.

However, individual consolidation is necessary in order to ensure the sustainability of the knowledge acquired, to be able to build on top of that knowledge. Considered by Stanislas Dehaene the fourth pillar of learning, besides attention, active engagement and error feedback, consolidation is depicted as a “shift from slow, conscious, and effortful processing to fast, unconscious, and automatic expertise” (Dehaene, 2020:421). Individual consolidation usually means repetition and practice, the advantages of spaced repetition and regular practice outweighing by far those of cramming before exams:

One-shot learning is not enough—children need to consolidate what they have learned to render it automatic, unconscious, and reflexive. Such routinization frees up our prefrontal and parietal circuits, allowing them to attend to other activities. The most effective strategy is to space out learning: a little bit every day. Spacing out practice or study sessions allows information to be permanently imprinted to memory. (Dehaene, 2020: 453)

2.2 Consolidation routine among students

This second sub-chapter focuses on the qualitative research as the methodological approach I found suitable for my case study. Despite its few drawbacks, such as considerable difficulty in data collection, analysis and schematic representation,

open-question interviews are extremely efficient here, since the study aims to investigate students' personal experiences, beliefs, preferences and routines.

As mentioned before, pedagogical creativity depends considerably on teachers' scientific understanding of the available strategies and on their capacity to carefully choose those that meet the students' learning profile. Knowledge consolidation routine, depicted in this paper as an important part of the teaching-learning process, and also as a prerequisite for developing a favourable outlook on long-life learning is to be achieved both in the class and individually, by the students themselves. For building such a routine in the class, the teacher can resort to a varied range of activities, as presented in the sub-chapters above. A pertinent understanding of students' approach on individual consolidation, of their already existing habits of consolidating the knowledge they acquire in the class, of their availability for improving their consolidation habits is definitely of much value, helping teachers adjust their strategies both when designing consolidation activities during the class as well as when delivering consolidation assignments for further practice.

Considering the profile of ESP seminars relevant for this study case, the related syllabus and students' English level, individual consolidation likely to be done by students mainly consists in reviewing class/seminar notes, including memorizing, repetition and further practice, practicing Business English writing skills, reading authentic materials according to their level and interests. Part of this consolidation is included in individual and/or team assignments and projects, therefore it is guided and required by the teacher and no reference thereto will be included in this research.

Including 8 open questions, preceded by a declaration of purpose informing students on the purely educational objective of the interview they are asked to fill in, the interview aims at showing relevant data on individual consolidation in terms of: students' motivation to continuous self-improvement, frequency of self-study activities, preferred method/activity and desire to improve. The interview was sent via the institutional email, initially addressed to a number of 75 students, i.e. 3 groups of studies. The current study is based on 41 interviews completed and sent back via email. No personal data was collected. Given the absence of any obligation to respond, some students (17) preferred to remain completely silent, some others (11) replied claiming lack of time as an excuse for not being able to respond, while some responses could not be included, either due to a considerable delay in reply or to inconsistent or incomplete answers.

All respondents stated to have been studying English for more than 10 years – *Question 1 [How long have you been studying English?]* - and to have been awarded a B1 (13 respondents) or B2 (28 respondents) level certificate, issued by the Ministry of Education and Research, following the linguistic competences exam, as part of the Bacalaureate final exam, or by Cambridge Assessment Centres, as part of individual application for Cambridge English Qualifications – *Question 2 [Do you*

hold a relevant certificate showing your English level according to CEFR framework? Please include the issuing institution in your answer]. Consequently, no participant is during his/her initial stage of FL (English in our case) learning.

Question 3 [Do you find the English class more difficult now than it was for you in high school?] aims to help establish any possible correlation between the students' needs and intentions to consolidate the in-class taken notes and the level of difficulty of the information provided in the class, as perceived by students. According to the syllabus, curriculum and the teacher's point of view and experience, the Business English seminar complies with a B2+, C1 levels according to the CEFR framework, any difficulty perceived by students being the consequence of topics novelty and the specificity of the vocabulary items. Over half of respondents considered the Business English seminar more difficult than what they had previously studied (a lot more difficult - 5, not very difficult but more difficult – 14, slightly more difficult – 8), the remaining respondents admit *it is different/it does not have the same structure as an English class in high school/it varies a lot from class to class*, still none of them states it is more difficult.

Despite personal expectations, no correlation could be made between those students admitting a higher level of difficulty of the current English seminar and their consolidation habits - *Question 4 [Do you spend time at home memorizing the new vocabulary or reviewing the notes taken during the seminar? (Please do not include here the time spent on compulsory assignments against a strict deadline, given by the teacher)]*

Probe 1: In case you do not revise for the English seminar, please mention a few reasons

Probe 2: How often do you revise for the next English seminar? Do you follow a strict schedule?

Probe 3: Do you feel like you need to revise more often?

Probe 4: Is a self-study routine important for your own language proficiency or only for achieving good academic proficiency?]

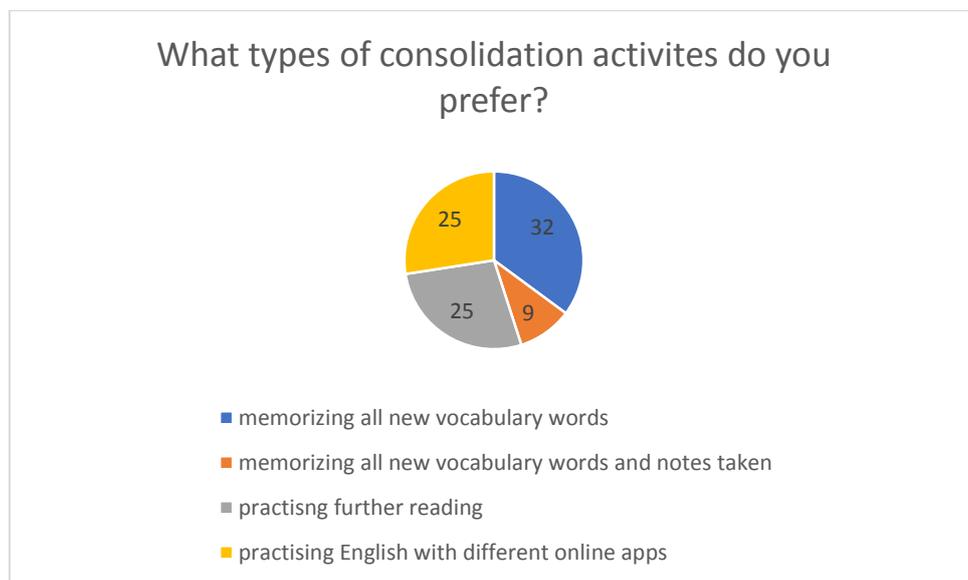
It has been revealed that a few students (8 respondents) will rather “cram” the day before the mid-term test or before the exam. The very same 8 respondents do not feel the need to revise more often, even if they are among those claiming a higher level of difficulty of their current English seminar. A considerable number (16 respondents) revise for the English seminar but not according to a certain schedule, while some students schedule relevant and regular revision habits independently: before every seminar (5 respondents), at weekends (8 respondents), or immediately after the seminar (4 respondents). Little less than a quarter of respondents admitted the lack of time as an impeding factor, most of these claiming to have part-time jobs also involving night-shifts. This finding somehow comes in alignment with what has already been suggested in the literature, i.e. planning the education outcome in

alignment with some other constraints, such as “individual, classroom, school, family, and society”. (Thomas and Ansari, 2020: 5)

All respondents are aware of self-study importance, even if the reasons are different for them: it is important (16 respondents) or even very important (14 respondents) for both individual language proficiency as well as for good academic results, important for academic results, but not for language proficiency (11 respondents).

As shown before, there are many and varied options to choose from when practicing consolidation in the class, and so are there for individual consolidation. Students admitted having different self-study preferences, ranked according to their perceived efficiency and personal liking. New vocabulary words memorizing was considered to be the most efficient consolidation activity by 32 respondents (80%).

Due to their diversity, the responses to this question were included into the following 4 categories:



More than half of the respondents preferring memorizing of both new or challenging vocabulary words as well as of the notes taken during the class also stated their commitment to building their individual thesaurus, by writing down all new vocabulary words learnt in the seminar, in a separate notebook of theirs - *Question 5. [What types of consolidation activities do you prefer?*

Probe 1: What is the most efficient consolidation activity for you?]

The amount of time learners spend on individual study is a determining factor in achieving language proficiency, generally acknowledged besides age, the learner's

cultural and linguistic background, exposure to target language outside the course setting, number of course attendees in one group and type of course delivery. As revealed by *Question 6 [How much time (minutes/hours/days) do you spend consolidating your Business English seminar notes, except the time spent on assignments delivered by the teacher?*

Probe 1: In case you revise only before the test/exam, please estimate the overall amount of time.

Probe 2: In case to revise regularly, according to a schedule, please mention the amount of time spent regularly.]

the time dedicated by our respondents to consolidate the notes they have taken during the seminar falls within a very wide range, which can be summarized as follows: less than 10 hours on the whole, during one full semester (8 respondents having also admitted to be cramming before exams), 1-2 hours weekly (13 respondents having admitted to revise weekly), roughly one hour weekly (16 respondents who do not follow a strict schedule). Mention should be made that vague answers, such as, *according to personal needs, according to my free time, on days off*, did not fit any range.

Against the background of various studies conducted by linguistic organizations and FL learning centres claiming that learners need 30 hours of self-study for completing one CEFR level, according to generic models, such figures become a matter of concern and confirm the need of the teacher's positive intervention at every stage of teaching for encouraging students' individual preoccupation towards self-study.

83% of respondents admitted feeling the need to *rehearse the completely new difficult, specific, Business English vocabulary*, on a more frequent basis than the other items discussed during the seminar - *Question 7 [Do you feel the need to rehearse certain items more than others?]*

One of the main reasons why students revise frequently includes the *self-confidence, ease, eagerness to respond in class* (29 respondents) - *Question 8 [Do you approach the tasks delivered during the English seminar differently once you have revised the previously taken notes?]*

3 Conclusions and recommendations

The students' capacity to assimilate and retain new knowledge, namely of turning it into prior knowledge over a long period of time, is a decisive factor in their academic and professional development over the years. It is commonly admitted that individuals are different in most aspects of life, hence a recipe for success learning by consolidation cannot be designed. Some individuals could require a larger amount of time, while others could learn efficiently in certain learning environments. Moreover, individual FL learning differences could be generated by differences in

working memory, a different short-term or long-term brain storage system. A possible improvement for more accurate results of such case studies in this regard could be the application of the Modern Language Aptitude Test (MLATs are tests applied with the aim to envisage the learners' aptitude and ease in learning a foreign language), in order to ensure a rather uniformity of participants in terms of FL cognitive factors.

Going far beyond the responsibility of delivering knowledge in personalized and appropriate manners, teachers should also consider the importance of assisting students in building long-life learning habits. A starting point in any such attempt is understanding students' judgement and their willingness to take on new roles and responsibilities.

This case study definitely revealed some issues which required immediate action for being dealt with.

A reward scheme was put in place, benefiting students who incorporate the previously taught challenging vocabulary in later class discussions or in written assignments. One envisaged purpose of this strategy is to encourage and motivate students to go beyond the memorizing stage as a means of consolidating knowledge, and attempting to reuse their acquired knowledge in new contexts. Memorizing ensures the storage of knowledge, while further practice, i.e. the incorporation of the newly memorized vocabulary words into the prior lexicon, ensures the subsequent transfer to long-term storage.

Attempting both to assist the few respondents keen on improving their FL level by using online apps as well as to encourage all students to commit their vocabulary words to long-term memory, apps such as Study Stock and Quizlet caught our attention for their twofold advantage offered: the teacher's ease of uploading and posting words so that revising and further practice can be guided and the convenience and flexibility in using them.

Furthermore, individual or team assignments delivered and supervised by the teacher are to be organized differently, i.e. increasing the pace of delivery and hand over frequency and breaking them down into chunks in order to avoid the building of the same habit of cramming before deadline. In addition, mock tests are to be introduced before summative assessments and exams, so as to encourage consolidation.

Last but not least, I reckon a better sharing of my teaching intentions during each stage of the class would help students focus on the importance of developing their cognitive capacity and hence adopt a regular consolidation routine, considering the strong existing evidence supporting that "interval learning is superior to massed learning" (Jensen, 2005: 148).

This research could be effectively expanded into action research, enabling the teacher to see how efficient or inefficient the measures taken are over an extended period of time or into further research on the impact of continuous formative assessment upon students' consolidation habits.

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