A Flipped Approach to Vocabulary Teaching in HCT Dubai Colleges Foundations Level 03: Utilising Spaced Repetition for Consolidation

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Abstract

Flipping the classroom involves students doing what would have traditionally been done in class at home, prior to the lesson, and then doing the homework in class time. New technologies allow educators to create feature-rich video and audio content, tailor-made for their students, which those students can view at home as many times as they like before coming to class. In class, the teacher should now have more time to devote to activities that practise the concepts introduced in the flipped portion of the lesson. The Centre for Applied Learning and Multimedia (CALM) Department at HCT Dubai Colleges, in collaboration with the Foundations Department, has produced short video modules to pre-teach the target vocabulary for Level 03 designed to be used in a flipped classroom scenario. Finally, spaced repetition is used to consolidate the vocabulary and ensure that it moves from short-term to long-term memory. Spaced repetition is a learning technique that uses increasing periods of time between reviews of material. The full programme has been piloted with one Level 03 class at Dubai Women's College. This paper will describe in full the pilot programme, including feedback from the pilot staff member and his students.

Background

In the 2011-12 academic year a few sections of students at Dubai Women's College began using a piece of free software on their laptops called *Anki* with the aim of helping them better recall the target vocabulary. *Anki* is a flashcard programme that uses a spaced repetition algorithm to bring vocabulary items back for review at the appropriate time. This initial experiment with spaced repetition took place in the now discontinued Diploma Programme. Obviously, like any other learning tool the effectiveness of it depends on the commitment of the student to its use. The students who used the software regularly found it to be extremely beneficial.

In order to be eligible to enter the Bachelor's Programme at the Higher Colleges of Technology students must attain an IELTS overall band score of 5 with no individual band less than 4.5. Students who are unable to meet this requirement enter the Foundations Programme, which is designed to raise their level of English and Maths to one sufficient to cope with study at Bachelor's degree level. From its use in the Diploma Programme, spaced repetition

had attracted enough support from senior management for its implementation in the Foundations Programme. Also, at the end of the 2011-12 academic year there was a lot of discussion about the flipped classroom. The idea of using videos to present the target vocabulary items prior to students coming into class, coupled with the kind of systematic review process that spaced repetition could provide, seemed a very good match. This paper will describe the initial pilot implementation of this programme.

The Flipped Approach

Oxford University press has published a list of high frequency words selected by language experts for their importance and usefulness. This list of words is known as the Oxford 3000. Foundations students are expected to leave the programme and enter year one of the Bachelor's Programme with a good command of this list. The Foundations Programme is divided into four levels, each taking one semester for students to complete. Depending upon their ability, students may enter into the programme at any of these four levels.

Faculty in each of the four levels of the Foundations Programme have been tasked with teaching a certain number of these 3000 words. At the beginning of the 2012-13 academic year, DWC Foundations teachers in Level 03 identified around 500 words that they felt could be taught within Level 03. With the aim of maximising the amount of time students would have to practise using the target vocabulary in class, it was decided to use a flipped approach to deliver the basic teaching of the vocabulary items.

The idea behind a flipped approach to teaching is simple: that which was traditionally done in class is now done at home, and that which was traditionally done as homework is now completed in class. Flip teaching is a form of blended learning which uses technology to allow learning to take place prior to the lessons so teachers can spend more time helping students instead of lecturing. It is often done using teacher-created videos that students view outside of normal class time.

Two of the pioneers of the flipped approach to teaching are Jonathon Bergman and Aaron Sams, high school chemistry teachers from Colorado, USA who began creating video modules for their students to study prior to coming to class. The class time was then spent putting the content presented in the video into practice. Explaining the motivation behind this approach, Sams said that his students needed him present to help them with tasks that would typically be done away from the teacher and that they could receive the discrete content through video or other means. Bergman and Sams are very positive about this way of teaching and cite many benefits. The authors say flipping speaks the language of today's 'digital native' students. Raised in an environment where technology and the Internet in particular are omnipresent, they are at home with technology in a way older generations aren't. Instead of discouraging the use of technology such as mobile phones, Bergman and Sams (2012) argue that we should be harnessing their power for learning.

The flipped model also provides opportunities for students to receive content at a time that is most convenient for them. By making content available for viewing on a variety of devices we can facilitate the much talked about 'any place, any time learning'. Bergman and Sams note that while it may not be a panacea for the busy student, it definitely provides more options.

Next, some students, for whatever reason, may struggle with the content in their courses. Oftentimes this may result in a situation where once behind means always behind. Flipped modules of discrete, well-taught content allow those students who struggle in class to view the content again in their own time and at their own pace. There is none of the embarrassment of appearing stupid in front of the rest of the class. The ability to repeat the content, even if it doesn't lead to full comprehension, will at least allow the student time to formulate apposite

questions that can be asked of the teacher at an appropriate time.

Another possibility to aid struggling students that the flipped model allows is for stronger students to help their weaker colleagues through peer teaching. Alternatively, the teacher can set more challenging work for the stronger students while he/she is able to devote more time to those who are finding the material difficult. Stronger students who understand the material easily also have the option to fast-forward through the sections they understand and to get on to more meaningful practice material.

Bergman and Sams feel that flipping the classroom increases student-teacher interaction. The majority of class time can now be spent on projects that practise and extend the target material. The 'sage on the stage' role occurs outside of the classroom. Within it 'the guide on the side' is able to take over allowing the teacher to develop a closer relationship with his/her students than in a traditional teaching model.

Most articles on the flipped classroom suggest positive benefits to using this model but there are, as yet, few empirical studies. However, one study that does include empirical results is offered by Professor Simon Bates and Dr Ross Galloway of the School of Physics and Astronomy at the University of Edinburgh. They redesigned the curriculum for first year physics students so that content and material is delivered for self-study in advance of the lectures. In other words, the course has been inverted or flipped. They note that their lectures have been transformed from traditional transmission of information sessions to guided discussion with a focus on peer instruction. Bates and Galloway say that "by all measures we have used to evaluate it, the course presentation this year has been a resounding success, and this has been confirmed by the end of course examination results. This examination, which focussed heavily on problem solving, had a pass rate of 89%" (Bates & Galloway, p. 6).

Spaced Repetition

The concept of spaced repetition (distributed learning) is based on work originally done on memory by the 19th century psychologist, Herman Ebbinghaus. Ebbinghaus conducted various experiments on his ability to recall nonsense syllables and developed the idea of the forgetting curve. Very briefly, the forgetting curve is a graphical description of how we forget. His work suggested that unless we make a conscious effort to recall an item we forget extremely quickly. For example, we are unable to recall the vast majority of say, something like a lecture a few days after it occurred. However, he also found that by reviewing the material, it was possible to once again remember 100% of what was originally known. (Encyclopaedia Britannica, 2013)

More importantly, by regularly reviewing, it is possible to increase the time that the desired information is kept in memory. The implication here is that while we still need to review material to remember it, we can increase the intervals between repetitions. This method seems to be ideally suited to use with information that needs to be committed to memory such as vocabulary items.

There have been many studies that show the positive effect of distributed learning. For example, after a study of 184 articles on various aspects of distributed learning, Cepeda et al (2006) state, "More than 100 years of distributed practice research have demonstrated that learning is powerfully affected by the temporal distribution of study time. More specifically, spaced (vs. massed) learning of items consistently shows benefits, regardless of retention interval, and learning benefits increase with increased time lags between learning presentations."

The Pilot Programme

At the beginning of the 2012-13 academic year the programme began with the Foundations Programme Level 03 students. Each week students were expected to learn approximately 30 words from the target vocabulary list. In order to flip the classroom, English teachers from both the HCT Dubai Men's and Women's campuses created video modules teaching 10 or 11 words. There were three modules created for each week's target vocabulary using the e-learning software *Articulate Storyline*.

The intention of the video modules was to provide students with some kind of base-line knowledge of the vocabulary before coming to class so that the teacher would be able to offer more interesting and challenging vocabulary activities that would extend the students' understanding of the words and their ability to use them in a variety of contexts. With that in mind, the video modules followed the same pattern, giving a clear pronunciation model, the dictionary definition from the *Longman Dictionary of Contemporary English* (online version), and at least one example sentence placing the word in a clear context before offering a translation of the word into Arabic. Each word was presented within a 30 second to one minute time frame.

 The brief video explanation was designed to give the students the most important elements of the word's meaning efficiently and thus provide the base from which further exploitation of the target lexis could be developed. Although all sections in Level 03 of the Foundations Programme were able to receive the video modules, due to various problems, only one section was given the spaced repetition application. These problems have now been resolved and all Level 03 students in Foundations across both campuses are to receive the *Anki* application in the second semester of the 2012-13 academic year.

The *Anki* Spaced Repetition Application

The application is free for the computer version; however, the iOS version is expensive at $25. The application is not merely a flashcard programme of which there are many available free: what sets it apart is the spacing algorithm, which very quickly creates an individialised study programme particular to each student. For each of the target words, four cards have been created as described in Table 1 and illustrated in Figures 1 – 4 below.

Table 1

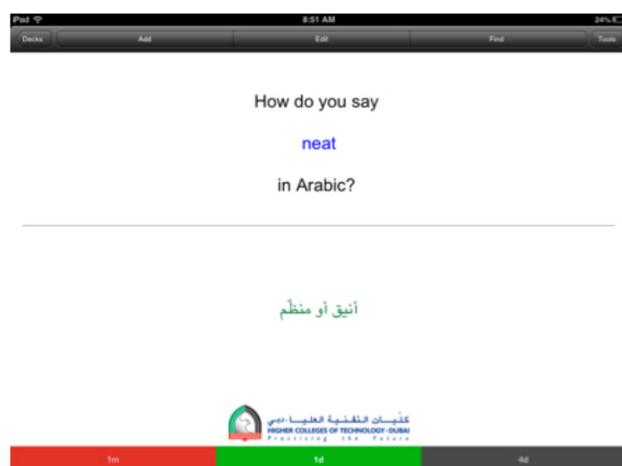| Front side	Reverse Side
English word	Arabic translation
Arabic meaning	English translation
English definition and example sentence with target word missing from the sentence	English word
A sound file of the target word (English) to test spelling	English word

Figure 1

Figure 2

Figure 3

Figure 4

The screenshots above show the four different cards produced for each word. Figures 1 – 3 show the question card with the answer. Please note that in Figure 3, students are given a definition of the target word and an example sentence with the target word missing. The answer to this question type is always the root word, though the form of it may differ in the example sentence.

At the bottom of the first three cards are the three choices students are given as to when they will next see the card. If they do not know the answer they press the red button, which brings the card back after a minute. If they made a mistake, but were close, then they choose the green card and see the question again in about 10 minutes. The final choice is the black button. This brings the card back in four days. These are the initial choices for when the question is repeated. As the cards are repeated again and again the intervals between repetitions get longer and longer. The length between repetitions is dependent upon the student's response.

Classroom Implementation

The following information is based on a personal interview with Steve Terney, an English faculty member at

HCT Dubai (personal communication, February 27, 2013). Steve is the only teacher to have used both the video and spaced repetition elements of the programme and is thus in a unique position to give feedback. It should be remembered, however, that the following are the opinions of one teacher only and based upon feedback conducted informally with one class of students. Once the programme is properly established then it will be possible to conduct more formal surveys of student perceptions.

Steve began using the videos in about Week 04 of the semester and the spaced repetition application *Anki* a few weeks after that. The video lessons were made available to students at the end of the week. Students were expected to view them over the weekend and come to classes on Sunday morning having watched the videos and completed the questions embedded in the storyline video modules. These questions consist of drag and drop matching exercise (words to meanings) and selecting the right word to fill an example sentence. On Sunday, the students would have a quiz administered through the iPad app *Socrative* to test their knowledge of the words and then throughout the week they would engage in a variety of different activities to consolidate and extend their knowledge of these words.

Steve mentioned that the flipped nature of the presentation removed some of the pressure he feels from a very crowded curriculum and allowed him to devote more time not only to vocabulary development, but also to reading in general. Steve reported that the students, in general, felt very positively about the videos, enjoyed using them and were happy to refer back to them. Most of the benefits suggested by Sams and Bergman referred to earlier were mentioned.

Steve also spoke very positively about the spaced repetition app *Anki*. He felt, once again, that the student response was overwhelmingly positive. It should be noted here that Steve is a very keen user of the app for his own studies and is convinced of its efficacy. This conviction is likely to be one of the reasons why his students are positive about using the app for review.

Conclusions

In conclusion, Level 03 Foundations teachers have built a comprehensive and extensive teaching and learning resource for the vocabulary element of their course. It is incorporated into BB Learn9.1 allowing student easy access to all the materials through their iPads. The flipped video modules provide the initial learning material, which is practised through a wide array of different in-class activities and iPad apps such as *Spelling City* and *Socrative* along with PDF documents, which can be annotated and used for test revision. Long-term retention is encouraged by using the spaced repetition app *Anki*.

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