

Introduction

The subject of this assignment is research into foreign vocabulary learning strategies (VLSs) used by year ten pupils at a Welsh comprehensive school. In accordance with British Education Research Association (BERA) guidelines (2011), the school will be anonymised using the phrase 'School X' and the year ten pupils taking part in the research will be referred to as participants.

There are two research questions being investigated: what VLSs pupils use most frequently, which is being investigated by use of a questionnaire; and whether rote learning is more efficient than studying words with pictorial representations of their meaning, which is being investigated in an experiment. These questions are part of the ongoing investigation by second language acquisition (SLA) researchers into language learning strategies (LLSs). The experiment is also relevant to research into dual coding theory (DCT) in the field of cognitive psychology.

School X is an English-medium, 11-16 mixed school with 465 pupils on the roll (Welsh Government). Most pupils come from homes where English is the dominant language and very few pupils speak Welsh at home (Estyn, 2017). This is significant because the aim of this study is to test VLSs on participants who are native English speakers, but not bilingual. The presence of an English-Welsh bilingual amongst the participants would compromise the study from a theoretical perspective. At School X, very few pupils have English as an Additional Language (EAL) (Estyn, 2017). Again, this is significant because the study focuses on English-Spanish word pairs. If an EAL pupil were unaware of the English word in this pair, it would compromise the study. Also, fifty per cent of pupils have a special educational need, which is significantly higher than the national average of 25.1% (Estyn, 2017). This is significant for

two reasons: certain special educational needs (SENs) might prevent the participant from effectively using VLSs, and the high level of SEN pupils in the school makes the group being studied unrepresentative of the general population, thus making generalisations impossible. However, this is not of relevance to this study because convenience sampling was used to choose participants and, as such, generalisations cannot be made reliably.

With regard to the year ten class involved in the research, none were bilingual or EAL pupils. One participant had colour vision deficiencies, which the Department for Education recognise as a possible SEN depending on its impact on learning (Colour Blind Awareness, 2017). This deficiency was not considered significant in this research because the images used in the experiment were black and white line drawings.

Literature Review

Both Smith & Conti (2016) and Harmer (2015) have commented that language teaching finds itself in a post-methods era. However, the question of the best way to help pupils learn a foreign language (FL) remains valid. The most common methods, as defined by Harmer (2015), are based on theories of SLA from the fields of psychology or linguistics. For example, the theory underpinning drilling of vocabulary items, often seen in the FL classroom, is based on Skinner's behaviourism. Stephen Krashen's influential theory of SLA provides the theoretical underpinning of frequently-used narrow listening (1996) and narrow reading (2004) activities, as outlined in Smith and Conti (2016, pp. 96-97 and 108). The theoretical underpinning of this research is cognitive learning theory and DCT.

Cognitive learning theory is a branch of cognitive psychology which views individuals as processors of information.

According to Stephen Pinker, (Harvard University, 2011), the cognitive psychology revolution involved a re-thinking of behaviourism in favour of 'the scientific study of the mind'. In terms of learning theory, it involves studying the mental processes that take place when learning occurs. Advocates of information processing suggest the human mind is like a complicated machine that works out rules and models (William, Mercer, & Ryan, 2015). This cognitive theory of learning which sees the human mind as an information processor has had a significant influence on the theory of SLA (Takač , 2008). Both Ellis (2000) and O'Malley & Chamot (1996) agree that explaining the process of SLA requires an understanding of the interaction between language and cognition.

There are numerous models of SLA that are based on a cognitive approach, such as Interlanguage theory, Bialystock's Analysis-Control model, Clahsen *et al.*'s Multidimensional Model, Anderson's Adaptive Control of Thought model, McLaughlin's Information Processing model, Ellis's SLA model, Youth and Perkins's cognitive/conative model of learning, and Skehan's model of individual differences in language learning. What is particularly relevant to this research is that these cognitivist models consider SLA to be 'essentially the same as any other kind of learning, analogous to learning to ride a bicycle or play a violin, although probably more complex' (Ellis, 1995, p. 295). This is important because, as Takač (2008, p. 26) has mentioned, 'cognitive theory recognises learning strategies as one of the significant learning processes in L2 acquisition'. However, according to Griffiths and Parr (2001, p. 249), LLS theory 'fits easily with a wide variety of different methods and approaches'. For example, they mention LLSs that can 'make the patterning of automatic responses which are characteristic of the audiolingual method more effective' and social LLSs that 'can easily be assimilated into communicative competence theory' (p. 249). Although LLS theory fits with a wide range of

approaches, its theoretical underpinning is a cognitive view of SLA, as opposed to Krashen's views of SLA, or the behavioural approach to learning. In practical terms, the very fact that the LLS theory fits easily into the framework of multiple methods and approaches means it has a valuable place in the post-method era of eclecticism in the FL classroom (Griffiths & Parr, 2001).

The aforementioned cognitive models all involve the inclusion of LLSs as an integral part of their explanation of SLA. There is, however, no consensus on what exactly constitutes an LLS. Macaro (2006) has criticised the theoretical framework of learner strategies on multiple fronts focusing on the lack of consensus in the research on the issues of: where learning strategies occur (inside or outside the brain); whether learning strategies consist of knowledge, intention, action, or all three; whether there exist sub-strategies as well as strategies which could be part of a hierarchy; whether the integrity of learning strategies survive across learning situations; whether learning strategies are always facilitative and effective; whether learning strategies are integral to language processing or an extra facility that speeds up learning; the use of undefined terms in strategy definition; learning strategies' relationships to skills and processes; and whether learning strategies lead to language learning and skill development over the long term. While it is beyond the scope of this assignment to engage in a full discussion of each of these criticisms, it is necessary to be aware of limitations in the theoretical framework when choosing and evaluating strategies to be used. Some of these criticisms are relevant to this research and will be discussed.

Oxford (1990) identified six groups of language learning strategies in one of the earliest and most influential taxonomies: cognitive strategies, memory strategies, compensation strategies, communication strategies,

metacognitive strategies, affective strategies and social strategies (p. 15). These strategies were compiled by making lists based on observation and intuition, interviews and thinking aloud procedures, note taking, diaries, surveys, and studies on language learning strategies (Oxford & Crookall, 1989). Not all these groups of strategies, however, directly apply to vocabulary learning, which is the topic of this research. For example, compensation strategies, defined as 'behaviours used to compensate for missing knowledge of some kind' (Oxford & Crookall, 1989, p. 404), such as inferencing when reading and listening, or circumlocution when speaking and writing, do not seem to be applicable to *learning* vocabulary. This research should be based on a taxonomy of strategies directly related to vocabulary learning. Therefore, whilst Oxford's categorisation of strategies is very influential and forms the basis of work in this field, it is necessary to investigate a taxonomy of strategies specifically related to learning vocabulary.

Specialised subgroups of language learning strategies that pertain to vocabulary learning have been honed. Drawing on Oxford's taxonomy, as well as 'relevant literature inspection, learners' retrospective descriptions of their own strategies and teachers' experiences' (Takač , 2008, p. 68), Schmitt (1997) developed a taxonomy of VLSs from which two will be tested in this research. The strategies that have been chosen are 'word lists' and 'studying a word with a pictorial representation of its meaning' (Schmitt, 1997, p. 207). Schmitt classifies these as belonging to the sets of strategies entitled cognitive strategies and memory strategies respectively. However, as Takač (2008, p. 68) has pointed out, the distinction between cognitive and memory strategies is difficult to maintain as 'both groups of strategies are used in recalling words through some form of language manipulation'. For the purposes of this study, the unclear distinction between the two groups of strategies is not

important because two strategies, rather two groups of strategies, are being compared.

There are several reasons why the VLS referred to in Schmitt's taxonomy as 'word lists' has been chosen. Firstly, studying word lists, or 'rote memorisation', is frequently used because of its efficiency. Carter (2012) suggests that the word list strategy should not be underestimated because vocabulary can be learnt quickly and effectively this way. Sagarra and Alba (2006) found rote memorization to be a more effective form of learning vocabulary amongst second language (L2) learners of Spanish at a large U.S. university than a semantic mapping strategy in both an immediate post-test and a delayed one. However, Macaro's criticism (2006) that sub-strategies as well as strategies can be labelled as a single strategy is relevant here. Does studying a word list involve studying the spelling of the words or subvocalizing the words, which is a form of verbal repetition, or both? These are matters that have not yet been resolved on a theoretical level, therefore will not be considered as a limiting factor in this study.

The second reason this VLS was chosen is my observation that rote memorisation is frequently used by GCSE pupils. This observation was confirmed by the results of the questionnaire investigating the frequency of VLSs used by the participants. Perhaps the pupils' use of rote memorization is due to their level as pre-intermediate learners of Spanish. Takač comments that 'the role of context in initial stages of vocabulary learning is negligible' (2008, p. 16). As a result, direct, deliberate attempts to learn vocabulary, such as rote learning, are the most accessible strategies to these pupils. Macaro (2006) confirms that many studies show group difference as well as individual difference in LLS use. Schmitt (2008) found in a study involving different age groups at high school and university that in the early stages of vocabulary learning,

beginner learners relied on word repetition, word lists, textbook vocabulary activities and flashcards, whereas more proficient learners were able to guess from context more often, ask the teacher for explanations, pay attention to connections between words and relate the words to personal experiences. Surprisingly, van Hell & Mahn (1997) found that the benefits of rote memorization were greater for experienced learners than beginners in comparison to a keyword method when learning concrete words. The involvement of phonology has been suggested as an explanation for this; subvocalization of the foreign word and its translation can activate and reinforce phonological information in memory (Ellis & Beaton, 1993). As is apparent, the issue of rote memorisation is the subject of theorisation as well as empirical studies and remains an important VLS worthy of further investigation.

The third factor which contributed to the decision to choose rote memorization is the lack of lengthy teaching necessary for pupils to use this strategy. Had an unfamiliar strategy been chosen, there would have been a need to follow a strategy training model, for example that suggested by Oxford (1990, pp. 204-208). 'Are you pressed for time, or can you work strategy training in with no trouble?' is one of the first questions Oxford poses in step one of her strategy training model. It became evident that a lack of contact time with the participants, in addition to the pressing matter of GCSE exam preparation, meant that not enough time was available to provide adequate strategy training for the purposes of testing an VLS that was unknown to the participants. Conversely, an interesting corollary to this research has been the delivery of awareness-raising training in VLSs, which is not as time-consuming but is engaging and motivating.

The second VLS being tested is 'studying a word with a pictorial representation of its meaning' (Schmitt, 1997, p.

207). Like the rote memorization strategy, this is a mnemonic elaboration technique in which FL words and images are related to previous knowledge (existing English words) through verbal and/or visual imagery (Sagarra & Alba, 2006). Whereas rote memorisation relies only on verbal representations to encode the Spanish words being learnt, the use of pictorial representations includes an image in addition to a word. This study hypothesises that Spanish words encoded using two representational systems - verbal and image - will be recalled with greater success on post-tests. This proposition is based on Paivio's Dual Coding Theory (DCT). Paivio states:

'The most general assumption of dual coding theory is that there are two classes of phenomena handled cognitively by separate subsystems, one specialised for the representation and processing of information concerning nonverbal objects and events, the other specialised for dealing with language.' (1990, p. 54)

This study follows Paivio's convention of referring to the two subsystems as 'verbal' and 'image' systems (1990, p. 55). These two subsystems are functionally independent, which means they can work either alone without the other subsystem or in parallel with the other subsystem, and functionally interconnected, which means activity in one subsystem can prompt activity in the other (Paivio, 1990). These are important factors in this research. The independence of the subsystems implies that either word or picture can be independently used to encode the Spanish word, as is the case with the 'word group', or both systems can be used in parallel to encode the Spanish word, as is the case with the 'image group'. The functional interconnectivity of the subsystems means that an image can provoke the recall of the Spanish word, as can a verbal representation (written translation in English). This suggests that pupils who see both pictures and words in their treatment material, according to DCT, have a greater chance of recalling the Spanish words.

Paivio's hypotheses about DCT are corroborated by empirical evidence in the field of neuropsychology. Studies on brain

function during language processing have found that there exist parallel pathways in visual-verbal processing in the brain (Di Virgilio & Clarke, 1997). Hence, concrete words that evoke visual images are processed in verbal and non-verbal codes simultaneously. In addition, concrete and abstract words are processed in different areas of the brain. Concrete words activate areas of the brain involved in mental image formation more than abstract words do, whereas abstract words activate brain areas involved in strategic retrieval of semantic information (Fiebach & Friederici, 2004). Moreover, it has been shown that concrete words are processed faster and more accurately than abstract ones in a variety of cognitive tasks. DCT attributes this to the fact that concrete words increase the activation of a right hemisphere image-based system as well as a verbal system (Jessen, et al., 2000, p. 103). These findings informed the decision to choose only concrete words in this research.

There have been several studies on the topic of VLSs that inspired and informed this research. Sagarra and Alba's research (2006) comparing the VLSs of keyword use, semantic mapping and rote memorisation at early stages of L2 acquisition was informative for two reasons. Firstly, the finding that semantic mapping produced worse retention than rote memorization further piqued interest in the effectiveness of word lists as a VLS. Secondly, the information that only recognition tests (as opposed to production tests) of vocabulary items were used indicated that this area of study warranted future investigation. A similar method of testing was present in a study investigating DCT published by the American Association of Teachers of Spanish and Portuguese. One of three research questions being asked by Farley, Pahom & Ramonda was: 'Does association of concrete lexical items with visual images affect their rate of recall by beginning L2 learners of Spanish?' (2014, p. 637). Although this was not discussed within a context of

VLSs, it does correspond to the question this study poses. As was mentioned in their conclusion, future research might investigate the effects of using pictures on learner's productive skills (Farley, Pahom, & Ramonda, 2014). With the recommendations of these research papers in mind, it was the intention of this study to use production post-tests.

School Policy and Practice

There is no official school policy when it comes to LLSs at School X. What is more, School X currently has no discernible systematic training of LLSs. However, it can be noted from observations of Spanish teachers that some informal transference of the 'how-to' of learning languages does occur. An example of this is an activity that teachers recommend to pupils for learning vocabulary: draw a spider diagram connecting all the words in a specific topic. Whilst this probably entails several strategies bundled together, and raises some of the issues Macaro discussed about what exactly an LLS is - such as where the strategy takes place (inside or outside the head) and whether the strategy consists of knowledge, intention or action - it is teaching the 'how-to' of learning vocabulary. Another example is when the teacher encourages pupils to rewrite mistranslated words correctly several times in their books. This is more clearly identifiable as a cognitive strategy that appears on Schmitt's (1997) taxonomy of VLSs entitled 'written repetition'. There are also other examples of encouraging pupils to guess the meaning from context or use their peers as learning resources, however, these activities are not explicitly presented to the pupils in terms of their strategic value. Yet if we accept Hatch and Brown's (2000) definition of 'vocabulary teaching strategies' as everything a teacher does or should do to help learners acquire target language vocabulary, then there are a

number of strategies that are employed at School X including those already highlighted.

Unfortunately, this limited transfer of 'learning-to-learn' knowledge in an ad hoc manner might not satisfy the suggestion made by Donaldson in *Successful Futures* that pupils should 'stand back and observe their own process of learning, and identify how it can be improved' so they become 'capable learners' (2015, p. 69). Donaldson explains that knowing when and how to use strategies to support learning in different situations can give learners greater autonomy over their learning and that good pedagogy encourages pupils to do just that (2015). The use of learning strategies has also been said to have a strong relationship to learner autonomy because they both encourage the self-directed nature of learning (Macaro, 2001; Oxford, 1990). In addition, LLS training was found to have a significant effect on student motivation and students' knowledge of strategies in a study carried out on first year undergraduate Arts students at the University of Hong Kong (Nunan, 1997).

There is a clear case for an explicit LLS training policy to be drawn up and implemented at School X. Not only would it demonstrate adherence to the principles of sound pedagogy suggested by Donaldson, but it would also afford School X the opportunity to be part of the Welsh Government's ambition to 'develop all schools in Wales as learning organisations' (Welsh Government, 2017). LLSs could be taught in Welsh and Spanish L2 classrooms. The in-service teacher training would involve investigating the topic and sharing findings with colleagues, but need not entail expert-like knowledge (Oxford, 1990). There is also potential to engage in long-term strategy training through KS3 and KS4 in the 'Languages, Literacy and Communication' area of learning and expertise (Donaldson, 2015) and involve cross-subject cooperation. Although dated, Oxford

provides salient information on LLS assessment and training in *Language Learning Strategies: What Every Teacher Should Know* (1990, pp. 193-212), which would be an excellent starting point.

Methodology and Ethics

Research question one: What VLSs do pupils use most frequently?

Design. The research question regarding which VLSs pupils used most frequently was investigated using a questionnaire which had already been developed, experimentally piloted and refined by Takač (2008) and, what is more, particularly suited the context of this study.

Procedure. The researcher explained the purpose of the study, the scale used on the questionnaire and how it should be completed. The questionnaire was to be filled in anonymously and participants were encouraged to ask questions if they needed any clarification of any of the statements. Fifteen to twenty minutes was allocated for its completion and participants were encouraged to answer honestly.

Materials. The Vocabulary Learning Strategy Questionnaire for Elementary Schools (VOLSQUES) developed by Takač (2008) was used.

Research question two: Based on Schmitt's taxonomy of VLS (1997), does the VLS entitled 'studying a word with a pictorial representation of its meaning' improve the rate of recall on productive tests in comparison with the VLS entitled 'word lists'?

Design. An experiment was the tool chosen to answer the research question about encoding foreign words using images because it could be concluded from an experiment that differences found in the outcome variables were attributable to the treatment (Punch & Oancea, 2014). This experiment followed a pre-test-post-test

control and experimental group design. There is one independent variable: the use of pictures. There are three dependent variables: one immediate and two delayed post-tests.

Procedure. Participants were randomly assigned to experimental and control groups to control for all possible independent variables. However, the small number of participants meant that, in practice, randomization did not have the chance to operate as a powerful control (Cohen, Manion, & Morrison, 2014). Participants were given a pre-test to evaluate their knowledge of the Spanish words being tested. None of the participants knew any of the words. Following this, the participants were briefed on the strategies to be used to learn the words. Any questions posed by the participants were answered. They were then given the treatment materials. The control group was given a list of Spanish-English word pairs and told to learn them by rote memorization. The experimental group was given Spanish-English word pairs along with pictures corresponding to the words and told to learn them by associating both the pictures and the English words with the Spanish ones. Both groups were given fifteen minutes to do this in silence. Immediately after the treatment the first post-test was administered. The second post-test was administered after thirty minutes and the third post-test was administered after four days.

Participants. The eleven participants in this experiment were year ten pupils studying the first year of the GCSE course. This was a non-probability sample given that no effort was made for it to represent the wider population, 'as is frequently the case in small-scale research' (Cohen, Manion, & Morrison, 2014, p. 155). As was mentioned in the introduction, there were no EAL pupils therefore no issues of 'cultural validity' (Cohen, Manion, & Morrison, 2014, p. 483) can be raised against the test. There were no bilingual pupils involved in the experiment to avoid confounding the results, but all the pupils were

learning Welsh as an FL as well as Spanish. In addition, all participants had received the same kind of language instruction before the treatment as they were from the same class.

In accordance with the ethic of respect that should define an educational researcher's approach (BERA, 2011), several ethical considerations were made. Firstly, the issue of voluntary informed consent was addressed by means of a letter to the pupils' parents asking permission to include their child in the study and detailing 'why their participation is necessary, how it will be used and how and to whom it will be reported' (BERA, 2011, p. 5). In addition, the participants were told of their right to withdraw from the study 'for any or no reason, and at any time' (BERA, 2011, p. 6). What is more, Articles 5 and 12 of the United Nations Convention on the Rights of the Child were complied with in accordance with BERA's requirements. Finally, participants' data from the experiment was anonymised. Each person was randomly allocated a number by selecting a piece of paper with a number on it from a jar. The participants were told to remember their numbers. The test papers were also numbered. For each test the participants were asked to find the paper corresponding to their number from the stack at the back of the classroom. Following the test, pupils were asked to leave their papers in a pile at the front of the classroom.

Materials. The words in this study included ten Spanish concrete nouns, two or three syllables long that do not appear on the KS3 or KS4 syllabi. Concrete nouns were used because they have been found to activate areas of the brain involved in mental image formation more than abstract ones (Fiebach & Friederici, 2004). The absence of these words from the aforementioned syllabi significantly reduces the probability that the participants had encountered any of these words previously.

Pre-test. Prior to the treatment, participants attempted a pre-test to evaluate any prior knowledge of the words being tested. Participants were required to translate the ten target words from Spanish into English. The words were presented in a list with Spanish words on the right and gaps for the English words on the left. The potential impact of ordering was diminished by randomizing the word order in the pre-test and post-tests, thus maintaining the independence of each item on the test (Gronlund & Linn, 1990).

Treatment. Having been briefed on the strategies each group was to use, both groups were given the treatment. The treatment materials consisted of a piece of paper with a list of word pairs for the control group and a piece of paper with both translations and images corresponding to the Spanish words for the experimental group. Participants were given fifteen minutes to learn these words using the assigned strategy.

Post-tests. There were three separate post-tests in this study to test the effect of the treatment over increasing periods of time. The participants were not told they would have three separate post-tests to avoid the possibility of them revising, thus avoiding confounding the results. The participants were shown ten PowerPoint slides, each time in a different order, of the ten English words with pictures. Each slide was shown for one minute. The participants were asked to write down the Spanish word corresponding to the word/image on the slide.

Scoring. Each word was given one point for being correct if it was spelt correctly in Spanish. Otherwise, no point was awarded.

Evaluation

This research did not require a long unbroken sequence of lessons. The initial information gathering stage (the questionnaire on VLSS) was administered before the experiment

took place. It took participants between fifteen and twenty minutes to complete the questionnaire. The experiment itself was spread over two lessons. The first lesson involved the pre-test, explanation of strategies to be used, the treatment, one immediate and one delayed post-test. Ten minutes of the second lesson was required for the third post-test. The subsequent VLS awareness training was held in the lesson immediately after the experiment and long-term strategy training is now being embedded into the structure of the GCSE course.

Information gathering

The first step of a learning strategy training programme is to identify (and diagnose) the strategies participants already use (Oxford, 1990; Macaro, 2001). It is for this reason that an adapted version of Takač's questionnaire was administered as the first step of the research. This information gathering tool appears in Oxford's list of strategy assessment techniques as 'surveys' (Oxford, 1990). It is one of several techniques she used when creating a taxonomy of LLSs. Diagnosis of potentially new strategies was as important as the identification of existing ones, hence her inclusion of such techniques as 'thinking-aloud'. Several of the tools that Oxford employed to gather information permitted open-ended responses, whereas the questionnaire that Takač designed asks participants to rate the frequency of use of a predetermined set of strategies. It is beyond the scope of this research to engage in a diagnosis of VLSs used by participants not already listed, so a questionnaire was an appropriate tool.

The decision to adapt Takač's VOLSQUES questionnaire was made primarily because of its appropriateness to this study, but also because it 'should be considered valid and reliable in measuring the frequency of VLS use' (Takač, 2008, p. 104). The questionnaire is appropriate to this study because it was designed for the context of FL learning as opposed to second

language (L2) learning and specific to the age group of ten to fourteen-year-olds (Takač , 2008). The context of this study is the FL classroom, that is a classroom where the language being learnt is not generally spoken in the locale. What is more, the age of pupils in this experiment is marginally over the upper limit of the one for which the questionnaire was designed. However, the questionnaire was adapted to accommodate for this. The three-point Likert scale, which Takač believed was 'more suitable for the primary school level' (2008, p. 92), was expanded to a five-point Likert scale giving older pupils more choice. Reflecting with hindsight, it might have been more appropriate to have given the questionnaire to KS3 pupils than KS4 so that it could be used on its intended audience.

The table overleaf shows the frequency of responses to the questionnaire which asked how often participants used each of the twenty-seven different VLSs. The highlighted areas show where more than seventy-five per cent of the participants have answered across either the lowest categories or the highest. It therefore shows the most and least used VLSs by the majority (seventy-five percent) of participants. VLSs 5, 7, 13, 22 and 23 relate to the participants use of media to learn and remember new words, such as remembering (picking up) or writing down words from films, books read for pleasure, songs, and TV programmes. Most participants rarely or never use these strategies. Perhaps this is because of the limited availability of easy-to-comprehend media for pupils to use. The exception to this rule is VLS 27 (I pick up words from the internet). Could it be that the internet is the pupils' media of choice and, as such, the most appropriate medium through which they acquire words?

Table 1 Frequencies of the VLSs used by participants

	Never	Rarely	Occasionally	Frequently	Very Frequently
VLS 1	9	2	1	0	0
VLS 2	2	2	3	1	4
VLS 3	0	6	6	0	0
VLS 4	1	0	1	3	7
VLS 5	4	4	2	0	2
VLS 6	1	2	6	2	1
VLS 7	10	1	0	1	0
VLS 8	3	4	3	1	1
VLS 9	1	1	5	5	0
VLS 10	1	0	4	4	3
VLS 11	1	4	6	1	0
VLS 12	3	4	4	1	0
VLS 13	9	2	0	0	1
VLS 14	2	1	1	3	5
VLS 15	6	3	3	0	0
VLS 16	3	4	4	1	0
VLS 17	6	3	2	0	1
VLS 18	1	7	3	1	0
VLS 19	2	1	1	4	4
VLS 20	2	6	3	1	0
VLS 21	1	0	1	7	3
VLS 22	8	1	1	1	1
VLS 23	5	4	2	1	0
VLS 24	4	6	2	0	0
VLS 25	2	5	4	0	1
VLS 26	0	0	2	6	4
VLS 27	4	0	4	3	1

When it comes to strategies that are used frequently or very frequently by most of the participants, there is also commonality. These are strategies that involve testing oneself, repeatedly writing down words, translation, mental repetition and using word lists. As they form part of the cultural fabric of the British education system and represent tried and tested strategies to deliver success, it is unsurprising that most participants use them. However, there is evidence that these strategies might be relied on at the expense of others. The total number of times participants rarely or never used one of the VLSs was 164 in comparison to 86 times when they frequently

or very frequently used one. This suggests that, in general, the participants do not use a wide range of VLSs. VLS 11 (connecting an image with a word's meaning), VLS 12 (associating words with other known words) and VLS 16 (making a mental image of a word's written form) are all strategies that are used occasionally, rarely or never amongst ninety-two percent of participants. They are strategies that are reasonably easy to apply and, for those reasons, formed part of the awareness raising training that took place.

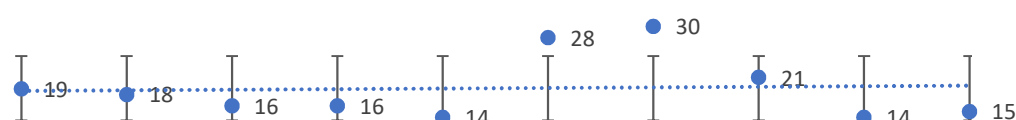
The Experiment

In evaluating the experiment, there are several criticisms to be made. Firstly, the sample size of twelve participants was too small. As the experiment is quantitative research, 'the larger the sample the better' (Cohen, Manion, & Morrison, 2014, p. 144). Cohen *et al.* suggest a sample size of thirty if statistical analysis is to be done on the data. As it stands, the current study is limited to elementary descriptive statistics such as totals, averages and standard deviations. In hindsight, it might have been worth carrying out the research with a larger class. However, limited contact time and practical considerations induced by the dual role of teacher and researcher meant that this was not wise.

The second criticism to be made when evaluating the experiment is regarding the choice of target words. The words were chosen based on them being in the same word group (concrete nouns), of similar length (2 or three syllables), not previously known to the participants, and not part of the GCSE syllabus. They were therefore considered to be equally difficult to learn. However, a closer inspection of the literature reveals that the level of abstractness, word-length and part of speech are all factors with no clear effect on the learnability of a lexical item (Laufer, 1997). Therefore, they need not have been controlled for. When considering nouns, factors that should have

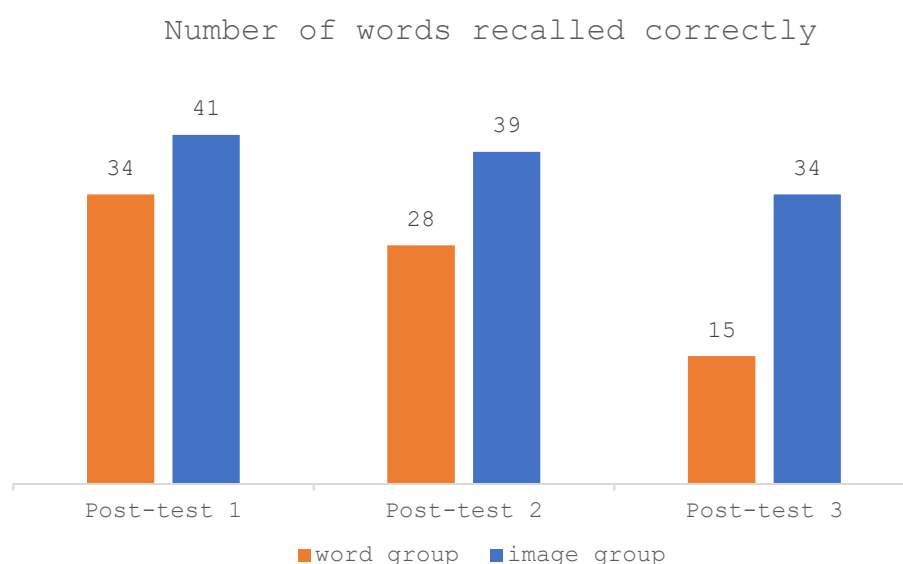
been controlled for include generality / specificity, phonetic regularity / irregularity, fixed / variable stress, and synformy between items on the test (Laufer, 1997). However, such a thorough analysis of the target words requires an in-depth knowledge of linguistics perhaps beyond the scope of this study. Nevertheless, some best-practice might have been taken from Sagarra & Alba (2006) who made use of the LEXESP, *Léxico Informatizado de Español* to find relevant lexical information on their target words.

Number of correct answers per word over three post-tests



The total possible number of correct recalls was 360, which would correspond to all twelve participants recalling all ten words correctly on three post-tests. The results from this study revealed there were 191 correct responses over the three post-tests. The average number of times a word was recalled correctly was 19.1 times with a standard deviation of 5.39. This information is depicted above. The horizontal line represents the mean and the vertical bars show one standard deviation. Most words fall within one standard deviation of each other suggesting that they were equally difficult to recall, however there were two outliers with 28 and 30 correct responses respectively. These words were *gota* and *cueva*, meaning 'a drop' and 'a cave'. None of the participants knew these words on the pre-test so it is assumed that they are easier to remember than the others because of a combination of factors such as their generality, phonetic regularity and fixed stress.

A final criticism to be levelled at the research method is the lack of follow-up testing. Whilst the preferred VLSs were identified, and two VLSs were tested over the period of a week, the effectiveness of the subsequent awareness-raising and strategy training was not empirically tested. This is perhaps due to time constraints and the ethicality of requiring pupils to learn vocabulary for their exams using VLSs that they might not otherwise choose. It would of course be expedient to continually ask pupils to learn vocabulary that was not part of their syllabus.



The results from the experiment show that the image group recalled more words correctly over the three post-tests. This supports the hypothesis based on DCT that using both the image subsystem and the verbal subsystem increases the rate of recall in comparison to only encoding words verbally.

In addition, the following graph based on the total number of words recalled in the post-tests shows that the rate of retention of words diminishes more quickly in the word group than in the image group, which suggests there might be longer-term advantages of associating words with pictures when learning them.



The following table shows the descriptive statistics for correctly recalled words broken down into the control group (word) and the experimental group (image), where N is total number, M is mean, and SD is standard deviation.

Measure	Group	N	M	SD
Post-test 1	Total	75	7.50	1.803
	Word	34	3.40	1.114
	Image	41	4.10	1.221
Post-test 2	Total	67	6.7	1.792
	Word	28	2.8	0.980
	Image	39	3.9	1.221
Post-test 3	Total	49	4.9	2.071
	Word	15	1.5	1.285
	Image	34	3.4	1.020

Conclusion

In designing and testing VOLSQUES, Takač was aiming to narrow the area of VLS research to a FL classroom and pupils between ten and fourteen, for example KS3 pupils in the British education system. These specifications fit well with this research, and the results of this study partly support the classifications Takač created based on her own 'several factor analyses on the variables referring to VLS' in her questionnaire (2008, p. 100). The three groups proposed in her classification are: strategies of formal learning and practising, self-initiated independent vocabulary learning, and spontaneous (incidental) vocabulary learning (acquisition). All of the strategies I described as part of the cultural fabric of the British education system (VLSs 4, 14, 19, 21 and 26) fit into Takač's first group. These are the ones the participants of this study use most. The use of these VLSs is 'based on instrumental motivation and is oriented towards concrete formal language learning tasks' (Takač, 2008, p. 104). Simply put, the situation has dictated the use of certain strategies. However, it was thought that the reason the majority of participants used strategies least was because of a lack of relevant media material. Takač's method of categorisation would not support this idea as these least used VLSs would be placed into Takač's group number two and three: the 'self-initiated independent vocabulary learning' group and the 'spontaneous vocabulary learning' group. Takač explains the second group of strategies as 'characterised by a more systematic approach to vocabulary learning' and the third group as 'characterised by exposure to the target language outside the classroom' (2008, p. 104). This difference in how to interpret the results is interesting. If we are to accept Takač's categorization, then it could have useful pedagogical implications. Pupils who infrequently use VLSs from category two could be encouraged to become independent vocabulary learners

by being trained in a set of strategies that would promote that very idea.

This questionnaire could be used as a useful diagnostic tool to identify the VLSs KS3 pupils use and, consequently, as a basis for training them in various VLSs. Training in VLSs and LLSs in general could be used in both FLs taught at School X, thus giving pupils the opportunity to 'transfer knowledge and understanding across different contexts' (Donaldson, 2015, p. 68) and 'take greater control of their own learning' (p. 69). Donaldson considers this to be good pedagogy because it ranges within the Area of Learning and Experience and encourages pupils to take increasing responsibility for their own learning (Donaldson, 2015). It is especially important to use a diagnostic tool to find out directly from pupils what VLSs they use, or feel are important because teachers' and pupils' perceptions can vary on this issue (Griffiths, 2007).

As has been mentioned, Macaro (2006) queried, *inter alia*, whether the integrity of learning strategies survive across learning situations. The VLS of associating images with FL words has been tested in a number of studies across different learning situations. Ninety-seven Spanish learners at Texas Tech University were the participants for a study by Farley, Pahom, & Ramonda, who found that 'picture treatment is better than non-picture treatment as assessed by the total rate of recall of all words' (2014, p. 645). However, this was qualified by apportioning the improved recall to the abstract nouns in the test. In fact, they concluded that no significant effect on the recall of concrete words was found as a result of associating them with images. Farley, Ramonda and Lui, whose participants were also university students, also found this to be true stating that 'images and pictures produce no additive contribution to meaning recall of concrete words' (2012, p. 460). This study, which took place in a school setting with year ten pupils, has

found the opposite to be true. The present study is, however, too small to be the basis of generalisations. It can be said, though, that Macaro's query as to whether LLSs maintain their integrity across learning situations is not supported by this study. However, it is necessary to point out that a different test method - a production as opposed to meaning test - was used, which could also explain the different results.

This study found that FL concrete nouns associated with images when being learnt have an increased rate of recall in post-tests in comparison to FL concrete nouns that are not. This finding supports Paivio's DCT suggesting two parallel pathways process image and verbal input, thus making it easier to recall words when they are encoded using both subsystems (Paivio, 1990). However, other studies conclude that concrete words are already connected to images in the memory and there is no additional benefit in associating images to them when learning (Farley, Ramonda, & Liu, 2012). This debate is relevant to pedagogical practice because of the considerable effort made by language teachers to associate both concrete and abstract lexical items with pictures when presenting them. Further studies are needed to investigate whether associating images with FL words affects their recall in terms of remembering their meaning, and in terms of producing them in speech or writing.

Personal reflections, professional development

The principal limitation in this research was the difficulty in juggling the roles of (novice) teacher, reflective practitioner, and researcher. The rigour of the research was to some extent compromised by the time sacrifices needed to plan lessons, teach them, and reflect on the practice. In my opinion, this limitation was inescapable, though it is always worth questioning one's own efficiency. The research project was,

however, extremely rewarding because it afforded me the opportunity to investigate a topic that is decades old yet currently relevant, specific to learning languages yet applicable to all learning. I feel that my knowledge of VLSs, their efficiency, frequency of use, and drawbacks has been greatly extended and will no doubt improve my practice as a language teacher.

Macaro comments that 'since the late 1970s, there has been widespread research interest in the strategies that learners use in learning and using second languages' (2006, p. 321) suggesting this is not a temporary trend in education. Donaldson says that learning-to-learn is a feature of good pedagogy that should be seen in Welsh classrooms today and in the future. This research shows that British pupils often rely on a restricted number of strategies when learning vocabulary. It is therefore important that I work within this longstanding area of research, considered good pedagogy by the great reformer of Welsh education, to further expand pupils' knowledge and use of VLSs as part of my own professional development. This is pedagogically important because there exists a correlation between learning success and the use of a range of VLSs (Kojic-Sabo & Lightbrown, 1999).

Training pupils to effectively use LLSs is itself an area of research. Oxford talks extensively about it (1990), as does Nation (2001), who suggests considering four steps in a strategy training programme: content, allocated time, teaching plans per strategy, and monitoring and feedback of strategy use. This model could form the basis of future investigation into the topic. The awareness-raising programme I have embarked on in School X is perhaps the beginning of something that will become a fully developed programme. An example of my current practice at School X is using the keyword method, 'one of the most studied vocabulary learning methods to date' (Sagarra & Alba, 2006, p.

229), to help year ten pupils learn nouns in the lexical set jobs. Firstly, the keyword method was explained, then the pupils were invited to use it to learn the lexical set. The results were not tested because the aim of the exercise was to familiarise the pupils in its use. It was enthusiastically carried out by the pupils who, in my opinion, enjoyed the idea of using a different VLS to ones they already know.

My future research into the topic should include different methods to gather information and test the VLSs. I found the experiment to be a restrictive research tool despite the fact that the ensuing discussion about possible causation is more valid. I would be interested in using interviews, self-report surveys, learning diaries, and 'think-aloud' procedures. The school environment is probably more conducive to the use of these research tools. A longitudinal study following pupils' use of VLSs with pupils from year seven to year eleven is also a topic of interest that could be the basis of future professional development.

I would be interested in further investigating the many teaching applications of DCT, especially the idea that 'learning is aided when material is made concrete (psychologically 'real') within the conceptual range of the learners' (Sökmen, 1997, p. 244). VLSs such as personalisation are relevant here and it would be interesting to see how pupils who go on school trips to a foreign country where the target language is spoken can use the experience to magnify their vocabulary learning.