Putney High School – Action Research Project

HOW EFFECTIVELY CAN THE MEMORY PALACE TECHNIQUE BE EMPLOYED BY SIXTH FORM STUDENTS TO SUPPORT FACTUAL RECALL AS WELL AS HIGHER LEVEL UNDERSTANDING (I.E. ENABLING ANALYSIS AND LINKS TO CONTEXT)?

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Introduction:

The main aim of this study is to enable students to apply the Memory Palace Technique so as to learn selected quotations from texts.[1] Briefly, the technique (hereafter: the MPT) entails imagining a building whose rooms correspond to particular categories or domains of knowledge, and placing objects within them that symbolize pieces of information; the building should be large (e.g. a school, museum, or stately home) and sufficiently familiar that the learner can already visualize a journey through its rooms before "furnishing" the rooms with what will be called, here, "mnemonic icons" (e.g. people who share a name with historic figures performing unusual acts, the very incongruity of which makes them memorable). One hypothesis is that, if the quotations are encoded as images with sufficient complexity – i.e. the specific "mnemonic icons" for quotes are linked to others that encode themes and literary techniques – they should support higher level understanding (i.e. analysis) when the students come to write essays and longer answers in closed-book examinations.

Context:

Prior reading on the subject of preferred revision techniques indicates that students most often use those that are the least effective, e.g. re-reading notes and highlighting key concepts.[2] There is also a growing concern that students' ability to embed, and then recall, large amounts of information is being eroded by increased use of digital media.[3] Having taught students to produce a variety of revision materials over almost a decade of teaching, it has become evident that producing mind-maps, self-testing with flashcards, and so on, are more "active" forms of revision, and more likely to be beneficial than expecting information

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[1] In a parallel study by Alex Martin (a History teacher at Putney High School), the technique was applied to the learning of historical facts and events, hence the relative success will be compared later in this report.

[22] E.g. Deborah Cohen, "Revision techniques - the good, the OK and the useless" (18 May 2013), *BBC World Service*: 'Revision charts, highlighter pens and sticky notes around the room are some of the methods people use to ensure information stays in their mind. But now psychologists in the US warn many favourite revision techniques will not lead to exam success.' The article is based on research by Professor Dunlovsky published in *Psychological Science in the Public Interest*, a journal of the Association for Psychological Science.

[3] 'The bottom line is that, despite its undeniable boons, digital media does pose a threat to optimal brain function.' Saga Briggs, "6 Ways Digital Media Impacts the Brain", informED (September 12th, 2016) https://www.opencolleges.edu.au/informed/features/5-ways-digital-media-impacts-brain/

to "seep in by osmosis". One would expect the MPT to be appealing because it has not often been used in schools and it also lends itself to highly individual and artistic responses, encouraging the students to take ownership of their work. (Students may be aware of the technique from the recent television series *Sherlock*, which has lent it a degree of glamour and fashionable eccentricity; Alex Martin, a colleague who conducted a parallel study with History students, made the connection in her own teaching materials, when introducing the technique to a class.)

More broadly, this particular project is part of Putney High School's (and the Girls Day School Trust's) programme of Action Research Projects, and twilight CPD sessions, to improve Teaching & Learning. The English & History departments have chosen to focus on Memory. Putney is a high-achieving[4] independent school (in the top 10 for London independent schools), where teachers expect the majority of students to be enthusiastic about new techniques, and generally self-motivated. At the start of the study, the hope was that there would not be much resistance to learning a new method, nor a limited ability to devise "mnemonic icons" for the quotations due to limited conceptual schemata (which is integral to the efficacy of the method).

As mentioned above, the preference for less productive revision methods among secondary students is a general problem in the UK, although we do not have extensive data about our own students. One intention of the study was to clarify the nature and scale of this problem through the use of survey questions, after testing students.

Literature:

> The method of loci…is a method of memory enhancement which uses visualizations with the use of spatial memory, familiar information about one's environment, to quickly and efficiently recall information. The method of loci is also known as the memory journey, memory palace, or mind palace technique. This method is a mnemonic device adopted in the *Rhetorica ad Herennium*, Cicero's *De Oratore*, and Quintilian's *Institutio Oratoria*.[5]

The main aim of this study is to enable students to apply the MPT so as to learn selected quotations from texts (rather than 'to recall faces, digits, and lists of words'[6] as in memory contests). Most websites dedicated to revision or memory techniques highlight the use of the MPT for learning Foreign Languages (in particular, the declensions or nouns and conjugations of verbs).[7] Some focus on Mathematics, and a few mention further possible uses,[8] but higher order thinking skills are rarely considered.

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[4] 2017 results: 98.9% A*-B at A-level; 92.1% A*-B at GCSE.
http://www.putneyhigh.gdst.net/userfiles/putneyhigh/images/body/Senior-School/Results-Destinations-and-Careers/Putney%20prospectus_2017%20(Academic%20results).jpg

5 https://en.wikipedia.org/wiki/Method_of_loci

6 *Ibid.*

7 Some websites describing how to use the Memory Palace for Language Learning:

As was proposed above, if the quotations are encoded with sufficient complexity – i.e. linking the "mnemonic icons" to others that encode themes – learning them should support higher level understanding (i.e. analysis) when the students come to write longer answers in closed book tests and/or public examinations.

The Rationale for the Intervention:

The target group were Year 13 students studying Marlowe's *Doctor Faustus* for A-Level English Literature. Participants were informed that an action research project was imminent when they took an assessment to obtain baseline data, in Spring 2018. The following lesson, the nature of the project was explained, and the rationale. It was envisaged that participants should be fully conscious of the purpose of the study, and the likely benefits, although no guarantee or claim was made for a specific degree of improvement. It was felt that the minimal value of engaging students with the activity would be that they felt pleased to be part of such a project, and reassured (consciously or unconsciously) that there should be some benefit however small, if they produce revision materials in a different fashion, rather than concerned that they might be wasting time in the run-up to public examinations. The general reaction was positive, and no-one expressed any concerns about this.

Whatever else students prefer, applying the Memory Palace technique is a kind of 'effortful, varied practice', as is recommended by many recent researchers.[9] Whether students consciously, deliberately use the technique in an exam a few times, or not at all, reviewing the text with a different approach should already have supported retention and increase "retrieval strength". Revision should be active and entail trying to retrieve information often, rather than re-reading notes as if that will embed the ideas more deeply in ones mind.

Generally, when revising, students are recommended to "double-code" information so that each concept/fact/datum is linked to more "schemata", making it easier to recall. As Daisy Christodoulou points out in *Seven Myths about Education*,[10] almost everyone over the age of three can remember the sequence of 16 letters in the phrase "The cat is on the mat" but accurately remembering a sequence of 16 numbers is extremely difficult for most adults without consciously applying technique. Because the letters are grouped into words that constitute six pieces of information (rather than 16) and the memory is reinforced by the internal rhyme of 'cat' and 'mat', the sentence is especially easy.

- http://www.languagesurfer.com/2013/03/27/building-a-memory-palace-for-language-learning/
- Anthony Metivier, "How to Use a Memory Palace to Boost Your Vocabulary" https://www.fluentin3months.com/memory-palace/
- https://litemind.com/memory-palace/
- https://linguisticator.com/memory-techniques-and-language-learning/

8 http://www.real-memory-improvement.com/the-memory-palace.html

[9] Presentation by Phoebe Bradley during a Teaching & Learning meeting at PHS, Spring 2018.

[10] Daisy Christodoulou, "Myth I: Facts Prevent Understanding" in *Seven Myths about Education* (Abingdon: Routledge, 2014), p. 19

That said, the sequence of 16 numbers Christodoulou chose to illustrate her point (4871947503858604) proved easy to recall in a matter of seconds by matching two digits in each group of three or four to a year, and then the year to an album, with the other digit corresponding to a song with that track number, or a colour on the cover (such are the benefits of mild synaesthesia, and a large record collection). This would not, of course, work for everyone, and gets easier with age, but one would hope that most students have some area of interest that will provide them with pre-existing "schemata". Demonstrating recall of a long sequence can help to convince students to try the MPT, and/or (as was done in the introductory lesson) a 13-stage route through a Memory Palace I'd made earlier.

Teaching the Technique to Students

The action research project was introduced in a single (55 minute) lesson, the technique itself, and then students started "building" their memory palace, to be completed in their own time. After a brief discussion of how memory works and why 'effortful, varied practice' (*supra*) is so valuable, the technique was broken down into the following stages:

- Pick a large building you know very well, with a number of rooms suitable for your purpose

- Imagine a logical order in which you might walk past the rooms – a journey through the memory palace, as it were.

    - *If in doubt use Putney, and move along the Long Corridor, then up the stairs into the Sixth Form Centre*

    - If particular rooms can be in some way associated with the themes of a scene, use them; the offices, too, might have useful prior associations.

- You are going to place objects and figures in each room that stand for key quotations…but also the themes you associate with them.

- This way, you should not merely recall the quotes but also the themes, and perhaps even literary techniques.

For the sake of "scaffolding" the students' efforts to build a memory palace, they were provided with a provisional plan (below), in which rooms in the Sixth Form Centre of PHS corresponded to scenes in *Doctor Faustus*. This particular route through the school lends itself well to the task, although provided there is some connection – however tenuous – between the room and the themes, there are innumerable alternatives in any school with several dozen classrooms and studios, not to mention offices.

> ROOM 1 (History & Politics) → Prologue & Scene 1: Dr F is a new hero for a new age, a turning point in history and a time of political turmoil.

> ROOM 2 (Religious Studies) → Sc. 2: Dr F's servant, Wagner, mocks the scholars whose knowledge of theology seems inferior to his own

ROOM 3 (History) → Sc. 3: Dr F sells his soul to surpass other historical figures

ROOM 4 (History) → Sc. 4: Wagner uses demons [like those depicted in some wall-displays] to enslave a servant

Upstairs to ROOM 5 (Classics) → sc. 5: Dr F starts asking for various things, inc. a wife whom Mephistophilis compares to Penelope from *The Odyssey*.

SR6 (Geography) → Sc. 6: Robin & Rafe summon demons to fulfil their base, material desires.

SR7 (English)[11] → Sc. 7: Seven Deadly Sins arrive to distract Dr F from suicide.

SR8 (Art) → Sc. 8: Dr F visits Rome, which is described as a cultural centre full of impressive art and architecture.

Study Area (where students tend to sit around joking…) → Sc. 9: a comic scene with the servants and the Vintner.

World Class Universities office → Sc. 10: The court of Charles V, the most powerful man in the known world, at the time.

The Office of the Heads of Y12 & 13 → Sc. 11: Dr F meets the Duke & Duchess of Vanholt.

Head of Sixth Form's office → Sc. 12: After wasting his time with some lecherous scholars, Dr Faustus receives a warning from God, via the Old Man.

Back downstairs to the Career Advice Room → Sc. 13: Dr F fails to repent and is taken to Hell (analogous to being cast out of school and into the real world?)

The students spent the remainder of the lesson producing individual plans mostly using power-points so they could paste in images they found online, although some of the Art students drew their own. They were to continue the task in homework for that week (ensuring that all engaged with it) but recommended to spend longer, as this would be a legitimate part of their actual revision. A selection of quotes was also provided for each scene, which the students were to encode as "mnemonic icons" to be placed in each room, as well as any others they deemed suitable. As with the floorplan itself, the process of encoding a quote was modelled, as below:

> Her lips suck forth my soul: see, where it flies! –
> Come, Helen, come, give me my soul again.
> Here will I dwell, for heaven is in these lips

> To make it more memorable, try picturing the sole [*sic*] of a shoe flying out of Helen's lips. It's more effective if you <u>don't</u> imagine a-preternaturally-beautiful-Greek-woman but any Helen you know… …and picture an expanse of sky 'in these lips', or a church (i.e. a "house of God") with Dr F inside.

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11 SR07 is my own form room, where the students had been taught regularly since Year 12. They were invited to assign Deadly Sins to their fellow students, and cast their teacher as Lucifer or Doctor Faustus.

When adapting this method for their own purposes, it is strongly recommended that teachers model a few examples, and discourage Google-ing for arbitrary images, as "retrieval strength" is partly dependent on how well any given symbol is already embedded within a nexus of conceptual schemata. Note, too, that the "floorplan" of the Memory Palace is deliberately brief, and the descriptions mildly facetious; it was assumed that the students would be better disposed to engage with the task if memorizing the route alone were deemed a quick win. The baseline assessment had demonstrated that not all were secure in their knowledge of the plot, a year after starting the text, so the additional scaffolding was offered.

Results, part 1:

|	BASELINE TEST	FOLLOW-UP TEST	GAIN (%)	PREDICTION
1)	19	23	+21	A*
2)	29	39	+34	A*
3)	28	42	+50	A*
4)	15	30	+100	A*
5)	28	38	+36	A*
6)	N/A	27	N/A	A
7)	17	33	+94	A
8)	34	30	−12	B
9)	14	23	+92	B
10)	15	N/A	N/A	B
11)	22	25	+14	B
12)	15	32	+113	B
13)	17	28	+65	C
MEAN:	21.1	30.8	+45	

Improvements between the Baseline Test and the Post-Intervention Test
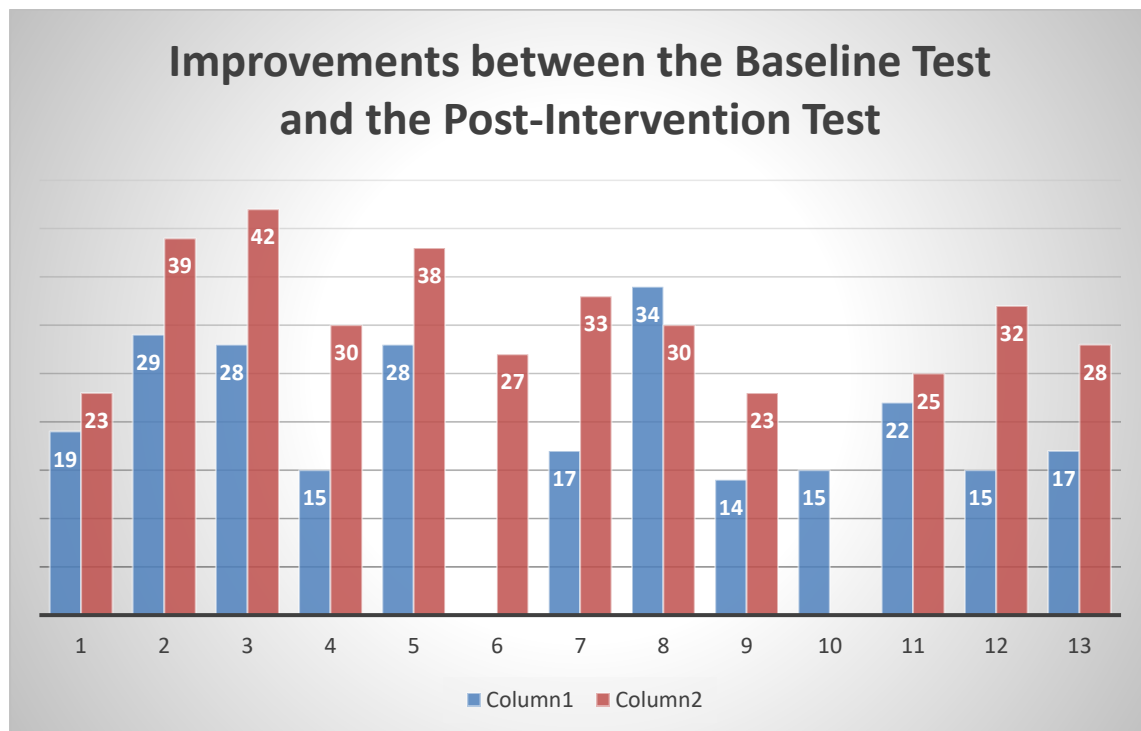
QUESTION 1

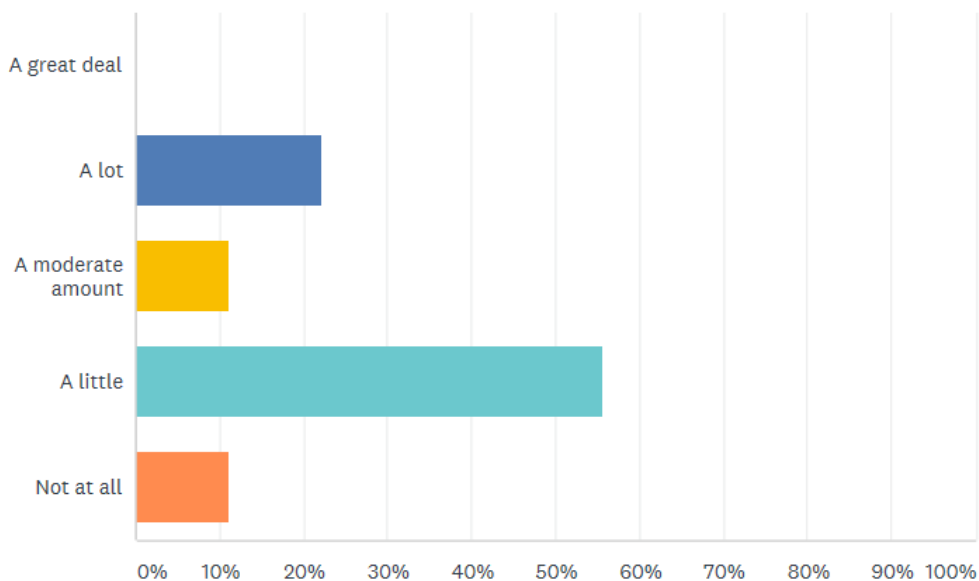## In recent tests or mocks, how much did you use the Memory Palace Technique (MPT)?

Answered: 9   Skipped: 0
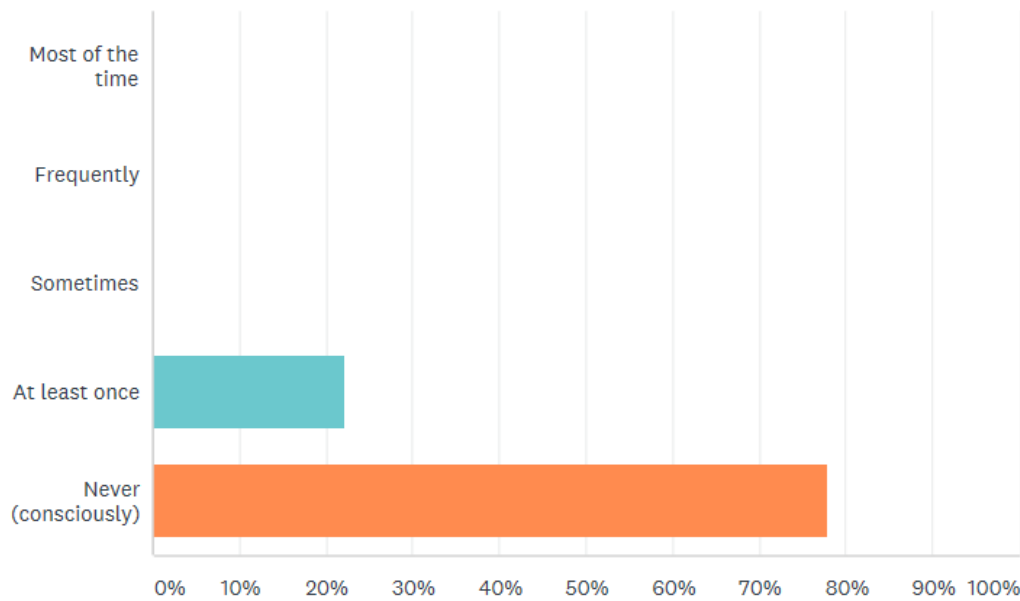
QUESTION 2

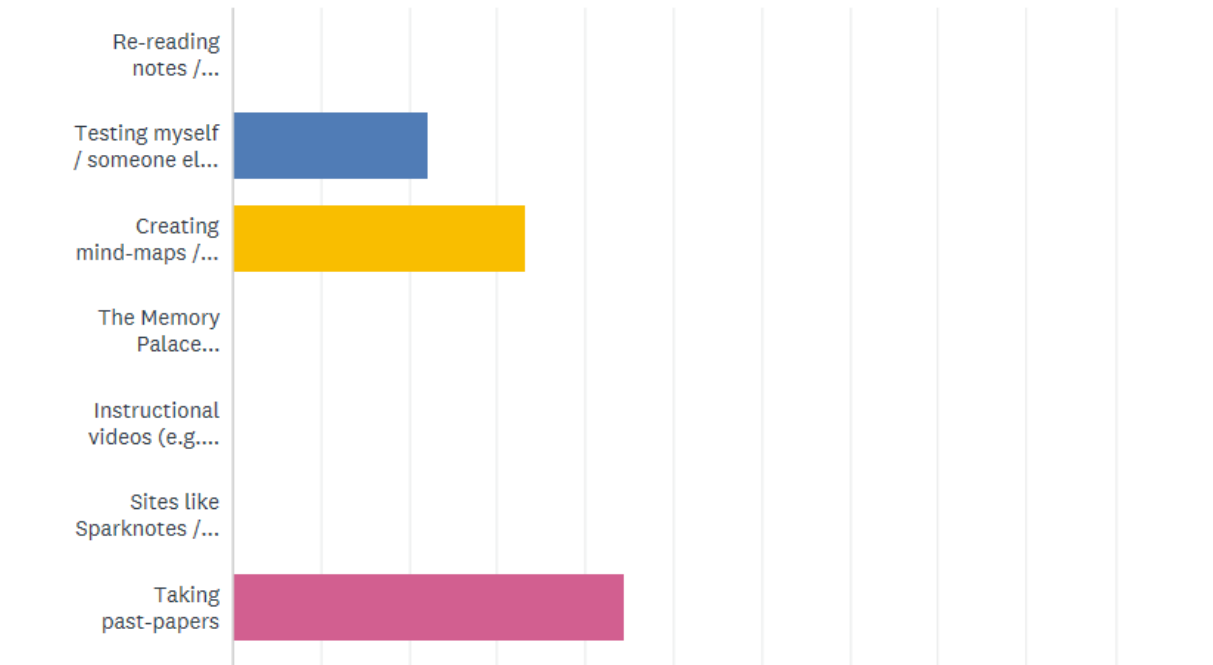## Did the process of "building" a Memory Palace help you to engage with the text and/or revision generally?

Answered: 9   Skipped: 0
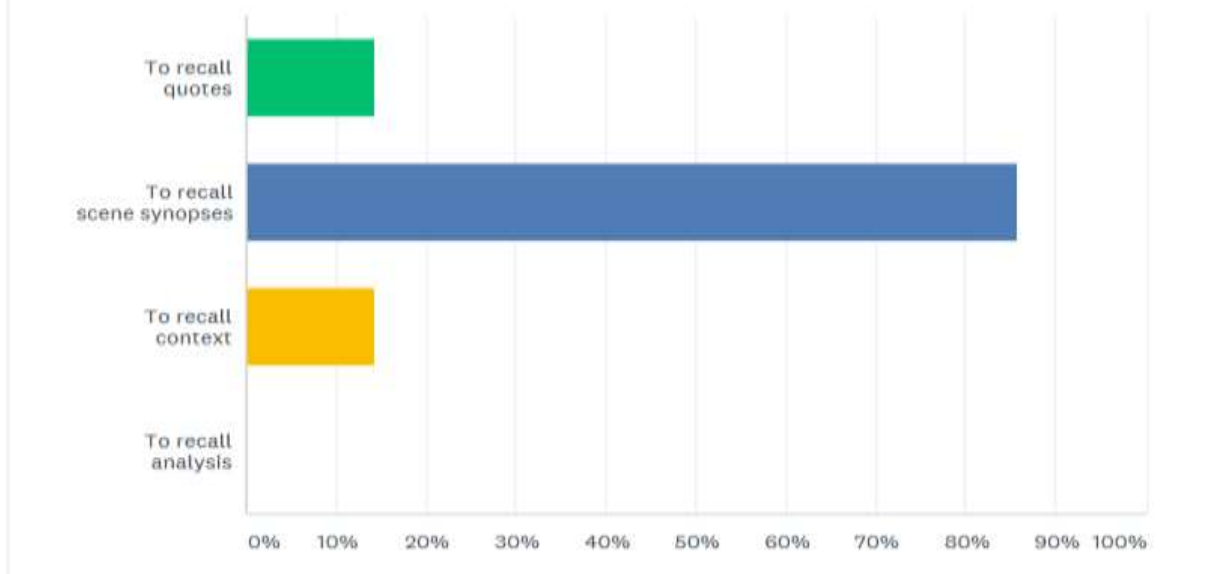
QUESTION 3

What are your preferred revision methods?

Answered: 9   Skipped: 0

QUESTION 4

How have you used the MPT? (Tick all that apply)

Answered: 7   Skipped: 2

QUESTION 5

Would you use the MPT in another subject? If so, what?

Answered: 6   Skipped: 3

RESPONSES (6)   TEXT ANALYSIS   TAGS

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Showing **6** responses

Yes, if I studied History I think it would be really helpful - each room as an event/country/time period. I think that the technique would have been very helpful if I had more time to build my palace - perhaps it would be a good thing to do with Year 12s?

5/16/2018 1:54 PM   View respondent's answers

Classics

5/16/2018 10:45 AM   View respondent's answers

Classics

5/15/2018 10:58 PM   View respondent's answers

probably not since my other subject is not suited to using this technique

5/15/2018 6:04 PM   View respondent's answers

No

5/15/2018 4:43 PM   View respondent's answers

Interpretation of Data:

      Regarding the Baseline Assessment (***Results, Part 1***), the Year 13s studied *Doctor Faustus* in Year 12, from September to the end of December 2016. They were examined on it in June 2017, hence they would have last read (or revised notes on) the text about eight months before the baseline assessment, in late-February 2018. None claimed to have started revising for their A-levels (beginning in late-May 2018), although all would be expected to have started by the time of the follow-up test (in mid-May, shortly before Study Leave). Incidentally, the students had been regularly required to recall information about the socio-cultural climate during the Renaissance (that they first learned in relation to *Faustus*) throughout their study of Shakespeare's *Othello* (from September 2017 to January 2018).

      At the time of the Baseline Assessment, no-one scored higher than 34/50 (or 68%) in the two classes that had not revised for 8 months; the lowest four scores were around 30%, and the mean was 21.1 (or 42.2%). The predicted grades for the students ranges from A* - C, with a mean of A, and a mode of A*. There was a strong correlation between test scores and A-level predictions, although some unexpectedly low scores for particular students revealed the huge impact stressful personal circumstances can have.

It was pleasing to see that 10 out of 11 improved in the space of three months, with only one student showing a small decrease. Gains ranged from 14% to 113% (albeit from a low baseline result) with a mean of 55%. However, a significant (average) gain was inevitable, given that the students were expected to have started revising independently, and that at least half of their lessons since the Baseline Assessment had been dedicated to revising *Faustus* (approximately 10, across 10 weeks of teaching). Unfortunately, there was no control group[12] who had not been subjected to the intervention (so as to ascertain its specific impact) and, as such, a questionnaire was needed to gather qualitative data about the students' subjective experience of using the MPT (see **Results, Part 2**, *supra*). While a minority of students reported using the MPT "at least once" since being taught how to use it, and most "never used it consciously" (Q1), more than 20% reported that the process of building the memory palace has helped their revision "a lot", and more than 50% "a little" (Q2).

Around 85% reported using the MPT to recall scene synopses; 15% had used it to recall quotes; and another 15% to recall context (Q4). These results suggest that the students might have used the basic plan of the memory palace (already created for them) as a prompt to recall when certain events took place, and only a minority had actually "populated" or "furnished" their memory palaces; alternatively, their memory palaces had not been sufficiently effective to enable them to recall what had not been encoded for them (quotes and context). Two of the questions in the survey referred to preferred revision methods (Q3) and the broader applicability of the MPT (Q5). While it might seem discouraging that none (0%) described the MPT as a preferred method (even with no limit on the number of choices), the methods they did choose can all be characterized as "active" (testing myself, >20%; creating mind-maps, >30%; taking past-papers, >40%) rather than "passive" (re-reading notes; instructional videos; visiting sites like Sparknotes). A future study might explore the correlation between preferred methods and academic attainment, which we have seen to be high, compared to the "national cohort".

Conclusions:

Researching the MPT, teaching it, and designing a Memory Palace were all interesting processes, albeit with some frustration in the early stage when it became apparent that there were few precedents for this study. Designing a method to determine the precise effect of the MPT itself was a challenge; one problem was that a control group (necessarily composed of students facing public exams) might find it dispiriting to be denied an opportunity to use a technique that others had been taught. The reliance on qualitative data was therefore an obvious limitation of the present study, but the teaching resources were designed so that other teachers can easily start their own follow-up studies, to determine the relevance to their own subjects, and other year groups.

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[12] A third Year 13 class (with a different teacher) had been revising *Doctor Faustus* for a few weeks, and the mean of their results was markedly higher (27.6, where n = 5, although it would be 32.3 without an "outlier" result of 9/50), although the class was also smaller with a higher proportion of A* predicted students. Regrettably, there was no opportunity to re-test this class after the intervention.

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Some websites describing how to use the Memory Palace for Language Learning:
- http://www.languagesurfer.com/2013/03/27/building-a-memory-palace-for-language-learning/
- Anthony Metivier, "How to Use a Memory Palace to Boost Your Vocabulary" https://www.fluentin3months.com/memory-palace/
- https://litemind.com/memory-palace/
- https://linguisticator.com/memory-techniques-and-language-learning/