

A comparative exploration of the distinctive qualities of oral, hand written and typed language in memory and recall

Cris Izura, Barnaby Dicker, Vivienne Rogers and Jordan Randell

Abstract

Cultural historians and philosophers have persuasively argued that the ways in which language is implemented (i.e., orally, in writing or in print) has a direct impact on memory and recall, and thus cognition (e.g., Derrida, 1997). One strand of their argument contends that – once established – these forms of implementation cannot be sharply separated or hierarchized as they form an ‘interiorised’ (Ong, 1982) cognitive composite. While evidence for this is abundant in the phenomenal world, the investigators find that questions remain to be answered from a cognitive perspective. The aim of this project was to explore the apparently intersecting but also differentiated cognitive processes involved in implementing oral, written and typed modes of learning. The investigators’ specific interests concern the relationship between language and graphic media in learning environments (specifically within HE). To this end, an experiment was devised in which a pre-established lecture was delivered (to three different groups of participants) in three different formats: (1) Following the oral tradition (i.e., including repetition, abundant use of epithets, etc.); (2) Read from a script and; (3) Using graphic media (e.g., PowerPoint). Immediately after the lecture participants were asked to: 1) recall the content of the lecture and 2) their general thoughts about the lecture. Results showed that participants in the lecture that followed the oral tradition recalled less content than participants in the other two lecture formats. No significant differences were found in the amount of content recalled by participants in the lecture read from a script and those who were in the lecture using modern technologies. All participants showed preference for lectures in which a combination of written material and graphic media is used. In addition, signs of an increased preference for computer based note taken were detected. The implications and potential applications of these results will be discussed.

Key Words: Language implementation, written, oral, graphic systems and media, memory, recall, lecture material.

1. Introduction

The implementation of language through writing has had a major impact at the historical, social and individual level. Writing dramatically changed the stakes of communication and transmission: from the transient life of the oral word to the durability of the written word. Writing allows individuals and groups to represent thoughts, ideas and facts. The tangible nature of the written word and its

comprehension allowed, among other things, reflection, analysis, revision and interpretation. These processes closely associated to literacy and mostly with reading, changed individuals' cognition by fostering cognitive development and increasing cognitive flexibility (Cartwright, 2002).

Historically, literacy emerged in chirographic, that is, handwritten form, a format that was revolutionized in the fifteen century by the emergency of the printed page and by the appearance, in the last century, of electronic communications and computerized graphics.

At first sight the differences and similarities between oral, handwritten, printed and electronic language are obvious. Looking to deeper levels, disciplines such as linguistics, humanities and psychology have studied and discussed at length the impact that different modes of language implementation have had on societies and individuals (Eisenstein, 1983; Georges, 1992; MacLeod & Kampe, 1996). Authors such as Ong (1982) and Fowler (1994) suggested, for example, that electronic communication or global networking will redefine the way of working, socializing and learning.

Between these disciplinary fields, however, there is a deficit of exchange. The humanities abound with theories and histories (e.g., The theory of the alphabetic mind (Havelock 1963, 1976, 1991); The great divide hypothesis or the continuity theory (Street, 1988)) of the impacts made by these different forms of language that barely step beyond social determinants, yet make some bold claims. Within psychology, rich data accounts for behavioural changes and differences in brain activity that are rarely linked to wider contexts of use or weighed down by demands of 'lab conditions' (Bialystock, 1991; Piaget, 1972, Snowdon, 2001).

The following study is a contribution to bridging the gap between the disciplines of psychology, linguistics and humanities with an empirical investigation into the distinctive qualities of oral, handwritten and typed language in memory and recall in a pedagogical setting. The study trades on several premises: language can be direct and in-direct. It can also be both simultaneously. Teaching is a good example of this simultaneity – a teacher can communicate directly with students in a classroom, imparting established indirect material and ideas. We wanted to ask how humanities, psychology and linguistics could be combined to help us advance our understanding of the interplay between oral and graphic modes of information transmission. We wanted to get a sense of what was happening in our own classrooms and what expectations we and our students are working to. These are all very big issues and our project is a small, initial gesture that only seeks to initiate a productive discussion.

To this end we aimed to explore the impact that oral, written and typed modes of communication had in recall. For this a three-tier mixed design experiment was devised in which participants were asked to attend three lectures and make notes (either as memory, written notes or typed notes) for subsequent recall.

2. Method

Participants

In order to gather participants an online survey with 16 questions was created and made available to undergraduate and postgraduate students at Swansea University in the UK. In the survey we collected participants' contact and personal details (email, name, age, gender and subject of study) and information on the students preferences in terms of modes of taking notes (i.e., handwritten, typed, or other forms) and lectures formats (i.e., oral, using visual aids, with handouts, etc.). A total of 403 students, 284 of which were females, answered the survey. These students were a mixture of undergraduates and postgraduates and had a mean age of 24 (range 18-47).

All 403 participants were contacted via email to participate in the subsequent study by attending one of three lectures. From them 57 students (47 females) with a mean age of 23 years volunteered to participate. All the students had normal or corrected vision and none had hearing difficulties or dyslexia. Eleven students in the group had English as a second language.

Materials

The experimental material consisted of a twenty minutes lecture on a topic chosen as being of general interest to the majority of the students attending the lecture. The title was: "Erikson, adolescence and psychosocial development". The lecture was delivered in three different formats: 1) orally, 2) read from a script and with supporting handouts and 3) with the aid of visual aids (i.e., PowerPoint). The lecturer was Dr. Chris Dobbs an expert social psychologist. The lecture content was divided in three phases of first 5 minutes, middle 10 minutes and last 5 minutes.

This allowed the design of a questionnaire were recall of the lecture content (at the first 5 minutes, intermediate 10 minutes and last 5 minutes) was tested. This questionnaire comprised a total of 9 questions (three questions per lecture phase). A further three sets of questions were asked to gather participants' general thoughts on the lecture they had attended to. These questions were: 1) "What do you think of the lecture? Would you improve it? How?" 2) "What part of the lecture did interest you the most? Do you think you would be able to tell someone else about Erik Erikson theory and life in any detail?" and 3) "Were there any parts of the lecture that you felt needed to be shown visually and they weren't? If so, which parts?"

Procedure

Participants were divided into three groups. The first group comprised 19 students (15 females). They arrived at the lecture theatre at 10am and attended the

lecture transmitted orally. The second group comprised 21 students (16 females). They arrived at the lecture theatre at 11am and attended the lecture that was read from a script. The third and final group comprised 17 students (16 females). They arrived at the lecture theatre at 12noon and attended the lecture that was delivered with visual aids (i.e. PowerPoint). After each lecture the group of students was accompanied to another room where they answer the two questionnaires. These questionnaires were presented in the same order to the three groups of students: first their recall of the content of the lecture was tested followed by the qualitative questions.

3. Results

From the content of the lecture

Descriptive statistics for the correct responses provided by the three groups of participants in the test on the content of the lecture are presented below in Figure 1.

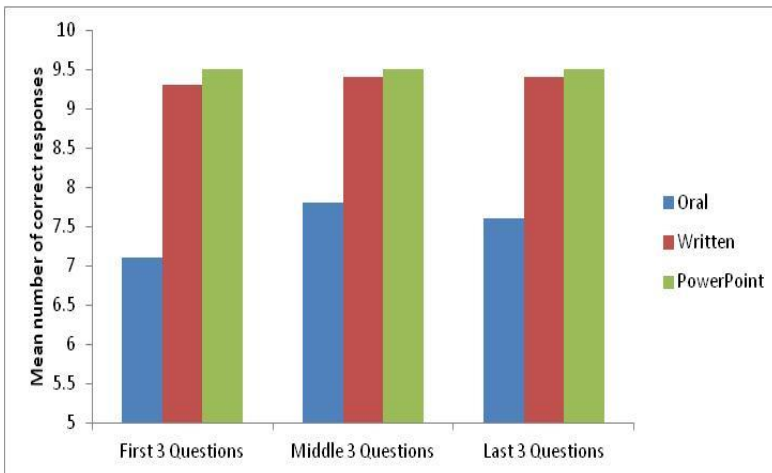


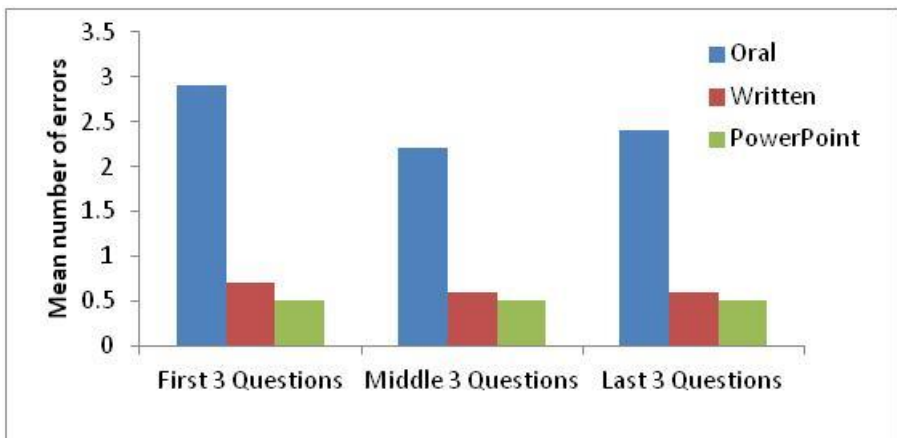
Figure 1. Mean number of correct responses to the content test by the three groups of participants.

The results from the first test answered by our participants were submitted to analyses. The one way analysis of variance (ANOVA) showed a significant effect of the type of lecture attended (oral, with handout or with PowerPoint) on the number of correct responses when answering questions relate to the content of the lecture $F(2,56) = 141.04; p < 0.01$. Post-hoc tests showed that the groups of

participants that attended the handout ($P < 0.01$) and PowerPoint ($P < 0.01$) lectures differ significantly from those attending the lecture that was delivered orally only, with the greater number of errors occurring in the verbal only lecture. There were no significant differences in the number of correct responses made by the handout and PowerPoint lecture groups.

Participants in each of the three groups were then divided into those that were allowed to take notes during the lecture and those that did not. No significant differences were observed.

A final analysis was carried out looking at the accuracy levels in the three parts of the lecture (i.e., first five minutes, middle 10 minutes, final five minutes). A recency effect was found on the oral group with the questions referring to the beginning of the lecture generating more errors than the rest (see Figure 2).



From the thoughts about the lecture.

A number of themes emerged from participant answers to the three lecture questions (coded using NVivo 9 qualitative data analysis software, 2010). Response patterns to each of the questions are commented and represented below in Figures 3 to 10.

Question 1: “What do you think of the lecture? Would you improve it? How?”

A range of different themes were mentioned when asked about their general thoughts on the lecture, with general thoughts including improvements such as the need for visual aids. Over half of the participants mentioned that they thought the

lecture was interesting and/or enjoyable (Figure 4), with the group attending the PowerPoint lecture making up almost 50% of the participants that thought the lecture was interesting. The group attending the oral lecture made the least number of responses regarding the general interest of the lecture.

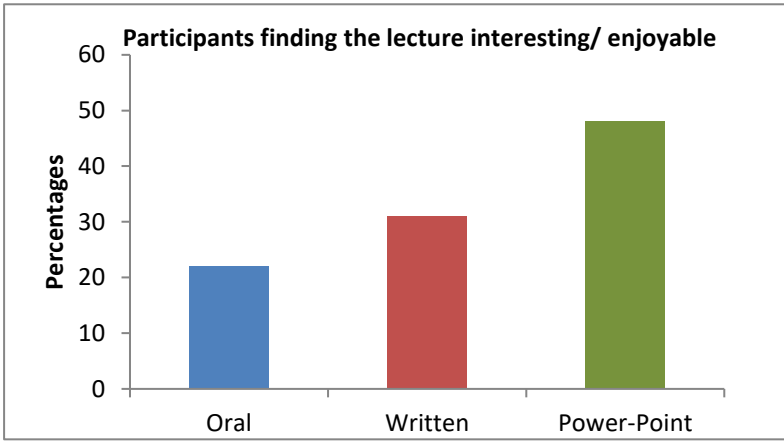


Figure 3. Percentage of responses arguing that the lecture was interesting and/ or enjoyable.

There were a fair number of improvements suggested across the entire population of participants but only one theme emerged a relatively substantial number of times; the need for visual aids. Both the 'oral' and 'handout' lecture groups mentioned that visual aids would improve the lecture. No responses to this end were obtained from the PowerPoint group. The 'handout' group make the most responses that visual aids would improve the lecture at approximately 54% to 46%.

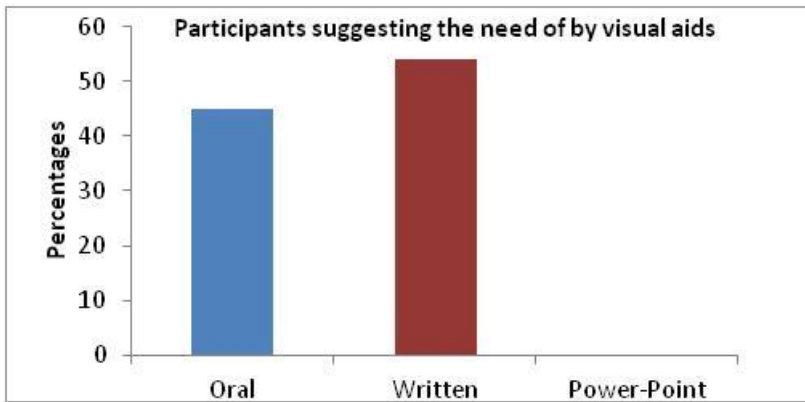


Figure 4. Percentage of responses suggesting the need for visual aids

Question 2: “What part of the lecture did interest you the most? Do you think you would be able to tell someone else about Erik Erikson theory and life in any detail?”

A number of responses were made across the board regarding the interesting points of the lecture. The themes with the most responses were two: Erikson’s biography (Figure 5) and the relevance that the lecture material had for participants themselves (Figure 6). Information on Erikson’s biography and life story are mentioned by one third of the participants overall. Most responses regarding Erikson’s biography come from the ‘PowerPoint’ group, followed by the ‘handout’ group. Participants attending the oral lecture were the group that least mentioned Erikson’s biography as an interesting point of the lecture.

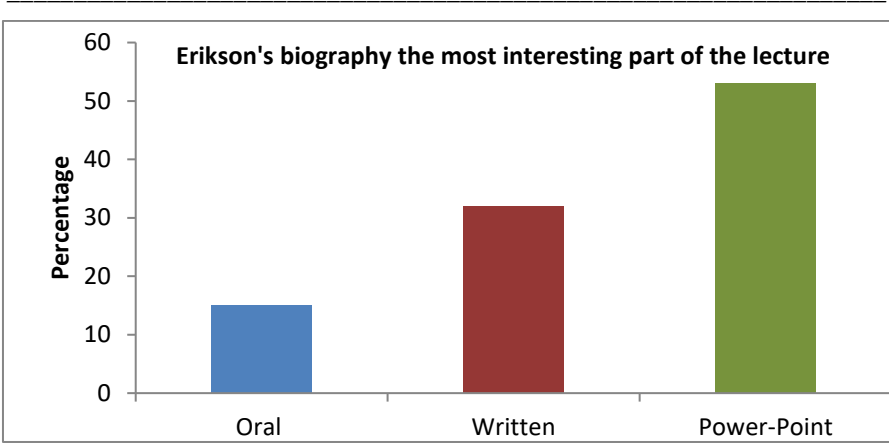


Figure 5. Percentage of responses mentioning that Erikson's biography was an interesting part of the lecture.

Approximately one sixth of participants pointed out that what most interested them was not the lecture content *per se*, but the relevance that Erikson's theory has to their own experiences growing up. This was most commonly reported by those participants attending the oral and handout lectures with very few individuals attending the PowerPoint lecture, coming up with this response.

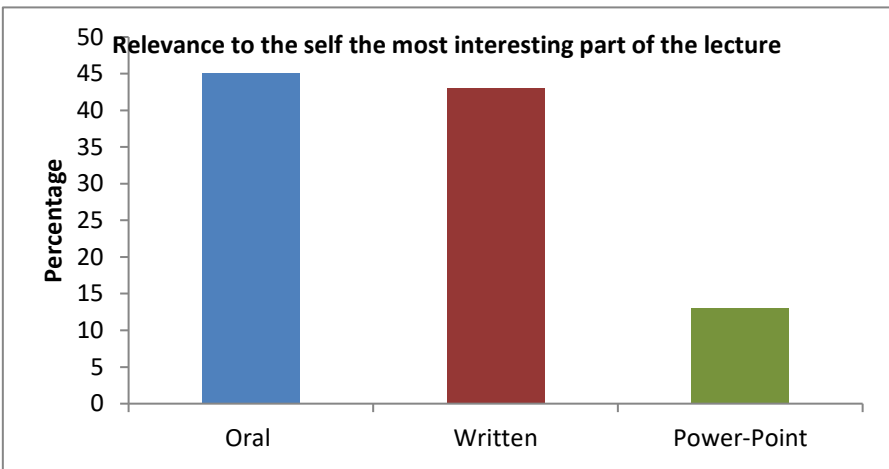


Figure 6. Percentage of responses stating that the relevance to the self was the most interesting part of the lecture

No-one across any of the three lecture types answered that they could not repeat any information to a friend, with the majority of people stating that they could repeat all or some of the lecture information to a friend. The percentage values for each group were divided into those responding ‘yes’ (Figure 7) and those responding ‘some’ (Figure 8). The percentages for both responses were quite close with the ‘oral’ only group answer “some” more often than both other groups whilst the PowerPoint lecture group answer “yes” outright most often.

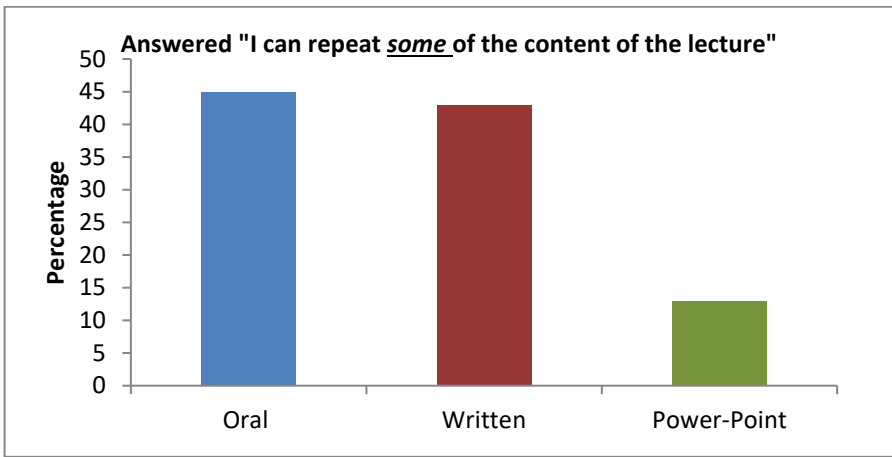


Figure 7. Percentage of responses indicating that they could repeat ‘some’ of the content of the lecture to a friend.

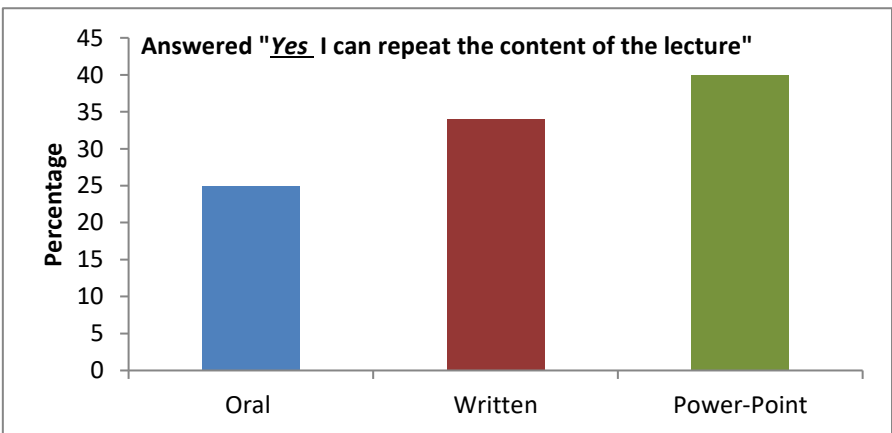


Figure 8. Percentage of responses indicating that ‘yes’ they could repeat the content of the lecture to a friend.

Question 3: “Were there any parts of the lecture that you felt needed to be shown visually and they weren’t? If so, which parts?”

This question generated a range of responses. The theme that emerges across most participants however was the “no need for visual aids” (Figure 9) for those participants attending the PowerPoint lecture (82%). Interestingly, both the ‘oral’ and ‘handout’ groups made more “No need for visual aids on the whole but only for specific aspects” responses than in the PowerPoint group (Figure 10).

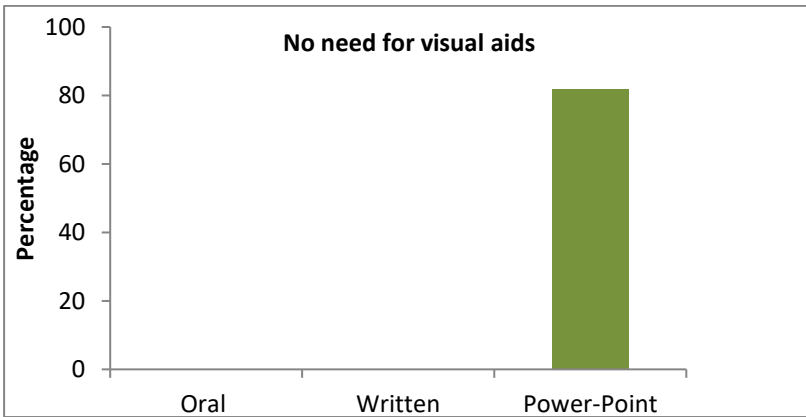


Figure 9. Percentage of responses indicating that there was no need for visual aids.

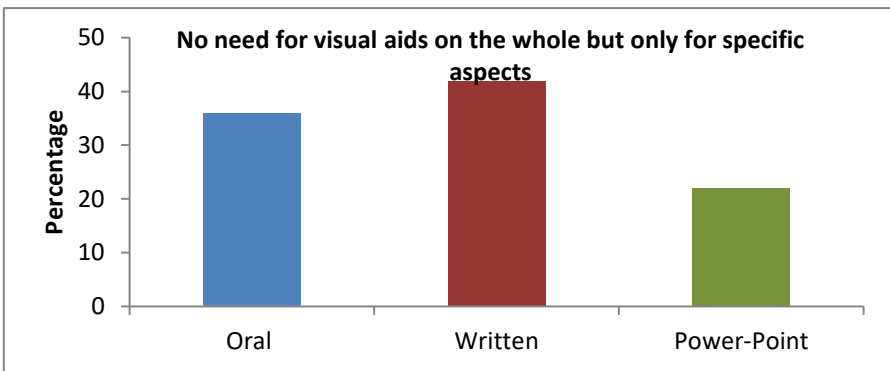


Figure 10. Percentage of responses indicating that there was no need for visual aids overall but only for specific aspects.

4. Discussion

The present study is the result of a cross-disciplinary effort. The aim was to investigate whether oral, typed and graphic modes of communication, and a combination of them) have an impact on recall. An experiment was devised within a HE setting, since it was thought that the classroom is a potentially lively multi-modal environment where oral, chirographic (handwritten), typographic and graphic are often combined modes of communication.

Three groups of participants attended a lecture on Erikson, adolescence and psychosocial development. The lecture was delivered in three different formats: orally, with handouts, with visual aids (i.e., PowerPoint). After participants attended the lecture they were asked to answer two questionnaires: one related to the content, one related to their general impressions.

Results from the content test revealed significant lower levels of accuracy for those volunteers that had attended the oral lecture. This group also showed a significant recency effect with better recall of the two latest parts of the lecture. Interestingly, the group in the 'handout' lecture and the group in the 'PowerPoint' lecture were equally accurate, indicating that visual aids do not improve recall over the printed material.

Results from the impressions that participants had on the lecture they attended showed that overall, the majority of participants enjoyed the lecture. Comments for improvement were highest in the oral only group and mostly related to use of visual aids although suggestions for improvement were also high in the scripted/handout only group, and again, mainly related to use of visual aids.

In terms of generated interest the 'PowerPoint' group found Erikson's biography 'significantly' more interesting than the other two groups. While participants attending the verbal and handout lectures found the 'relevance to the self' aspect of the lecture 'significantly' more interesting. One participant in the oral only group (no.8) stated 'Not watching the screen makes you focus on the lecturer and the topic, at least with this type of lecture (and topic).

In relation to their confidence to transmit the information to another person, the oral only group were over all more hesitant and cautious about how well they could pass on the lecture's information. This fact correlates with their error rate, and suggests accurate self awareness. Handout and Powerpoint groups felt generally more confident.

In sum, a number of potential avenues of enquiry were identified, as well as the fact that computer based note taking is showing signs of increase in the UK lecture based format. The oral transmission of information showed the lower learning rate. This group also showed hesitancy and doubt over recall ability, indicating accurate self awareness. Groups in the handout and PowerPoint lecture showed comparable higher learning rate and no significant differences were observed between those

tanking and no taking notes. Importantly, oral only and handout groups are possibly better able to reflect.

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