

How Does Thinking Time Affect Class Response?

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Rationale

Questioning is undoubtedly an essential part of teaching and learning. The most obvious benefit and purpose of questioning is assessing the level of knowledge of previously taught content which can then be used to form future teaching and learning. However, it is known that using assessment for learning which requires effective, considered questioning techniques can actually aid the learning rather than just checking or verifying it. Rather than the answer being one word at the very front of a child's mind, questioning which requires a process of thinking is more effective in terms of learning and gaining skills which can be applied in other contexts. However, it is clear that not every learner's thought process is the same. Some will have the answer almost instantaneously whilst the majority of the class may require significantly longer to think the question through. Practitioners having knowledge of how thinking time – the time between a question being asked and the answer being offered – affects the response from a class and putting that into practice could significantly change the effectiveness of questioning on the whole class. This has been considered in existing literature (Rowe, 1972) (Stahl, 1994) finding an average thinking (or wait) time given by practitioners of between 0.7s and 1.4s.

Aims

The aim of this enquiry was to explore and evaluate the consequences of varying the time between asking learners a question and the learner answering the question, both in terms of quantity of those offering an answer and the quality of the answer. This would allow the practitioner to implement the findings in their own practice to optimised learning and teaching experience of the young people.

Methodology

The research was carried out with a S.2 Science class of 19 pupils over a 4 week period. Initially a lower order question was asked and pupils were instructed how long they had to think before the answer was to be written on the "Show-me" boards. The show-me board method of answering was selected due to the requirement of every individual to attempt to answer the question, and ease concerns pupils may have about answering verbally. This allowed a more accurate result to be gained than, for example, a hands-up method. This was

disregarded as it could encourage disengagement of pupils as only those with hands up could be asked.

With regards to duration of time allowed, 1 second (almost instantaneous) was tried out initially, followed by a similar level of question but with 3 seconds of thinking time. This extension of time before answers were expected was highlighted before the question was asked. This was then repeated with 5 seconds of thinking time. The quality of answers offered was noted and recorded in addition to the quantity. As the questions were lower order and mostly based on recall initially, the variation in quality and depth of answer was limited.

In later weeks, higher order questions were asked of the class and the time between the question and the answer being offered was varied as before. These higher order questions were designed to highlight the difference in depth and quality of answers. Consideration was given to Blooms Taxonomy (Bloom, 1956) i.e. Knowledge, comprehension, application, analysis, synthesis and evaluation when progressing from lower order to higher order questioning.

In addition to the quantitative data i.e. the number of total answers and number of correct answers, the qualitative data i.e. the quality of the answers to the higher order questions was supplemented by exit passes on the final lesson of the enquiry.

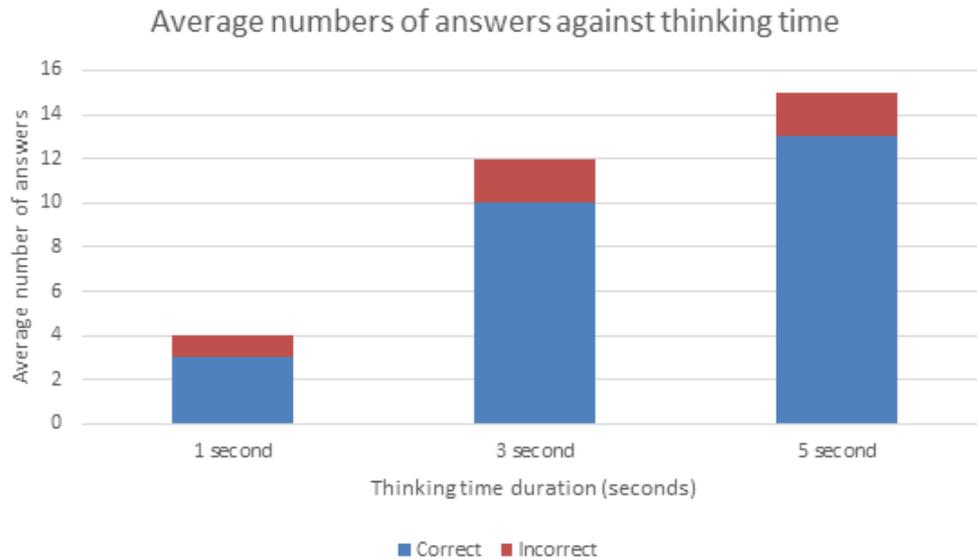
Pupils were asked two questions. These were:

1. “Did you prefer 1, 3 or 5 seconds to think before providing an answer?”
2. “Why did you prefer your chosen time?”

The pupils answered these questions anonymously on post-it notes, encouraging honesty in their answers.

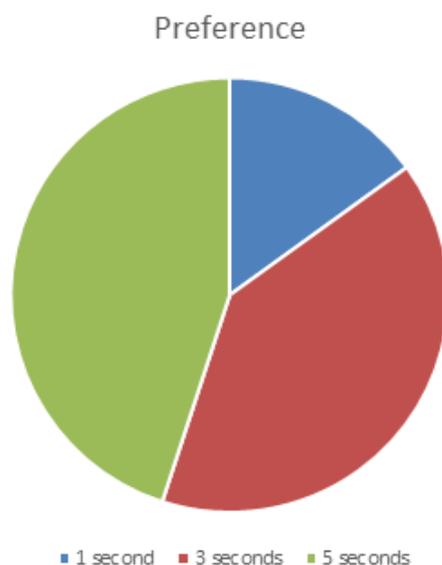
Findings

The average quantity of pupils answering and the number of correct answers after for each allotted duration of thinking time is shown in the graph below which covers both higher order and lower order questions.



The above bar chart shows that not only does the average number of answers offered increase the longer the class are given to think, but also the percentage of correct answers increases. For example, 75% of the 4 answers offered after 1 second were correct compared with 83% of the 12 answers after 3 seconds. Furthermore, 87% of the 15 answers offered at 5 seconds being correct compares favourably with the shorter durations. This indicates that a longer duration to think results in not only more answers but a better quality of answer. Clearly, the quality of the answers of the higher order questions can't be quantified, but it was observed by the practitioner that the quality and depth of answer increased significantly as the time increased. This was most evident in the change from one second to three seconds with answers after one second having very little depth.

The number of individuals that preferred the respective times, taken from the exit passes, is displayed in the chart below.



The above chart shows that a small minority (16%) preferred 1 second whereas 37% favoured 3 seconds. The most popular was 5 seconds, with 47% of the class preferring this longer duration. This aligns well with the findings displayed in the bar chart, showing that 1 second only allows a small minority of the class to access the answer and is not inclusive for the rest of the class.

A selection of comments from the exit passes describing why individuals preferred a certain time before answering can be found below for each preference.

1 second: “Didn’t need more time”

3 seconds “Helped me think what to write”, “1 second was not enough, 5 seconds too much”

5 seconds “I was more confident in my answer”, “It helped me to understand the question”

These comments demonstrate the variation in the needs of every individual learner and the need to be inclusive of all.

Conclusions

There is a clear trend that shows a significant majority of the class benefit from and prefer more than one second for thinking. This is of particular importance for higher order questioning which inherently requires more consideration. If the question is low order, i.e. a simple matter of recall then it is not quite as significant, however still disadvantages those pupils who require a longer duration to consider their answer. Asking a question and almost immediately expecting an answer is not inclusive of the vast majority who require time to understand what the question is asking them, and consciously forming an answer.

The disadvantage of not waiting long enough is that only a small minority of pupils will be able to access the question and form an answer, with the majority of the class not being included. It could be argued that the pupils who answer very quickly are pupils who would perform in any case. There is very little drawback to waiting an extra 4 seconds to suit the rest of the class with the exception perhaps of the small minority switching off for a few seconds.

Mention must be made that even after 5 seconds there were some pupils who didn’t answer. As participation was highlighted as mandatory and not opt-out, the conclusion must be made that 5 seconds was not sufficient. Further studies identifying how to be inclusive of all pupils in terms of types of questioning and answering in addition to studies looking at additional thinking time and optimising the duration to ensure extending does not disadvantage those answering very quickly, should be considered.

Implications for Future Practice

The conclusion from this study clearly highlights that in future at least some time must be allocated to allow individuals to consider their answer. The practitioner will consider this when planning lessons and allow 5 seconds before expecting an answer from any question. Other consideration will be given to the method of answering to attempt to get an answer from every individual.

Experimentation with questioning methods to ensure full participation, will be considered.

Bibliography

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