Student 1: Low Excellence

NZQA Intended for teacher use only

The purpose of my investigation is to see if time affects short term memory. (1)
Question: Is the number of items recalled after seeing a set of objects affected by the length of time between seeing the objects and writing them down?

From the information I was given I found that short term memory is 'the capacity for holding a small amount of information in mind in an active, readily available state for a short period of time.' Short term memory can be as short as a few seconds.

For my experiment I am going to take photographs of 10 objects and print them in black and white onto a single page. I am going to use a class of 30 year 10 students for the experiment. They will need to have a piece of blank paper and a pen. The variables will be the number of items that are remembered initially and then the number of items remembered after 10 minutes.
The students will be shown the page of objects and have one minute to study the objects. I will then take the page away and get them to write down all of the objects that they can remember over a two minute period. The two minutes will be timed to ensure consistency. Once the two minutes is up I will collect in the sheets of paper. I will wait a further 10 minutes before asking the students to write down as many objects that they can still remember. They will have another two minutes, which I will time, to write down the objects they can remember. I choose 10 minutes because the reading I did suggested that short term memory was restricted to a limited time. I also felt that 10 minutes was a good test to see how well the students had initially studied the original photos as this could also increase the initial number of objects remembered and the number of objects remembered after 10 minutes. It is important that the students don't have an opportunity to discuss the items they remembered during the 10 minute wait so I am going to ask them to read silently during that time. (2)
For each student I will allocate a number from 1 – 30 so they won't be identified and shouldn't feel any peer pressure about their memory.
10 objects will be used because I don't think anyone will remember all 10 of them, so it should be enough to get varied results from the experiment.
The objects are a pie, stereo, laptop, glasses, a calculator, finger, bucket, fence, car and batteries. I chose these objects as they were readily accessible objects at school and therefore easy for me to photograph.
I have chosen a black and white copy of the images because: (7)

1. the images appear more clear i.e the edges of the shape are sharper meaning that the object itself is more recognisable than in colour
2. the background colour does not interact with the object and hence the object is better represented.

I think that the number of objects that people remember initially will be more than the number of objects they remember after the 10 minute break, because based on my own experience and my readings, remembering things after a break is a lot harder than recalling them immediately. (7)

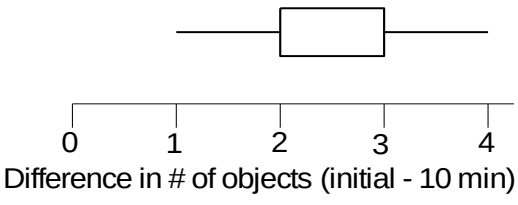
Because for this experiment I am investigating if there is a difference in the number of objects remembered I am going to take each individual student's results immediately after they have seen the pictures and then subtract from the same individual student the number of objects they remembered after 10 minutes. (3)

I have included the data in the appendix.

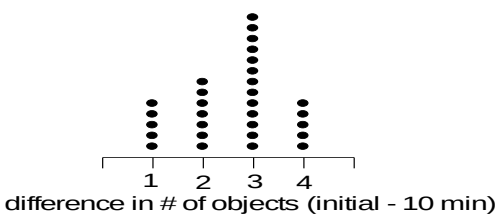
Table of measures of differences before and after 10 minutes.

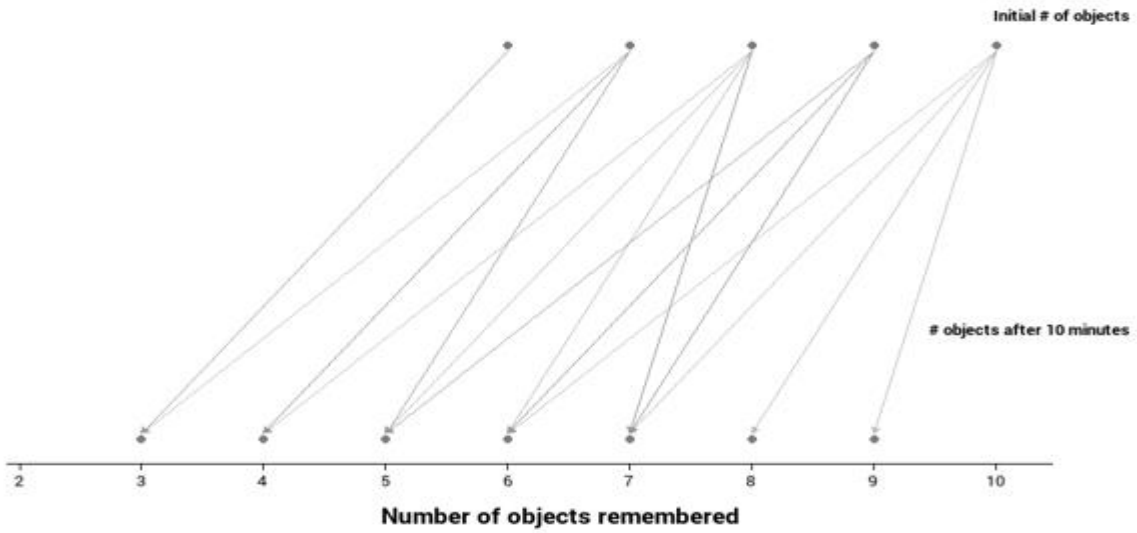
Min	LQ	Median	Mean	UQ	Max
1	2	3	2.6	3	4

Box and whisker plot of differences



Dot plot of differences (4)





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Looking at my graph I can see that four students in the class were able to remember all of the objects at the beginning so had a very good short term memory. All of the students remembered less objects after the 10 minute wait because the lines on my arrow graph show a decrease in items remembered. The difference in the number of objects that was remembered varied with the most common difference being three less objects remembered. I can see this from the dot plot of the differences where 3 is the highest column on the graph.

There was more variation in the number of objects remembered after 10 minutes than in the number of objects remembered initially. This is shown in the arrow graph where initially there were 6 – 10 objects remembered, and after 10 minutes this had stretched to 3 – 9 objects remembered. The full extent of the spread is hidden due to a number of double ups for example two students who went from 8 to 6 and three students who went from 9 to 6.

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None of the differences were zero and the distribution of differences on the box and whisker plot shows a small amount of left skew because there is a tail to the left. It is not that clear that people with a good initial memory also have a good memory after 10 minutes. Looking at the raw data (attached in the appendix) and the differences in the number of objects that were remembered, the largest difference was four less objects remembered and on the arrow plot this corresponds to the points (8, 4),(9, 5) and (10, 6). Also from the raw data it was interesting to note that of the four people that remembered all 10 objects initially, only two of them were able to recall more objects after 10 minutes than people who had scored below them initially. The people that remembered one less object after 10 minutes than they did initially were people that had a good memory (remembered 10, 9 or 8 objects) at the start.

I set out in my investigation to see if there was any difference in memory over time. The results I gathered from my experiment indicate that time does have an effect on memory as all the students in the class remembered less objects after the 10 minute break. This has been graphically shown in the arrow graph with all the lines moving in the same direction (downwards to the left).

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From the reading I was given, I learnt that the amount of information that can be kept in short term memory can vary but based on the results of a famous experiment on short term memory the number given is often seven plus or minus two which is between five and nine items. This number fits with the results of my experiment.

As a follow up, I would like to see if colour photo objects have the same effect as black and white images. Based around the research I was given one article stated that people remember objects better when they are in colour. This contradicted what some of the other articles suggested. So I think I should test to see if giving the objects in colour would result in fewer objects being remembered.

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