

IT has undergone a period of drastic change in regard to curriculum focus. Re-branding the subject name to 'Computing' recognises the greater focus on content that will allow our students to access challenging Computer Science courses more successfully at KS4 and beyond.

It is in this context that I base my research into subject perceptions amongst students. In particular, choosing to focus on year 7 illustrates the desire to encourage and develop an interest in Computing from an early age. It also echoes the opinion of Emma Mulqueeny (CEO of Rewired State, quoted from 'Little Miss Geek') who coined

the phrase, 'Year 8 is too late' when referring, in particular, to building up interest in girls.

My research is designed to gauge both interest level as well as basic understanding of Computer Science as a subject and career. Year 7 will have had a different experience of the subject up to now and may, therefore, provide useful insight into the further development of the KS3 curriculum content as we move forward.

Background

Research by the Australian Educational Computing Journal (2015) explored what it called 'key controllable factors' in developing an interest in the subject amongst girls. They highlighted the particularly negative impact of 'self-perception of skill level' and a generally negative view of the subject / career (often consolidated at home and exacerbated by the lack of tangible role-models). Added to this, research for Google (2014), not gender specific, suggested that both encouragement and exposure could help engender greater interest levels in Computing as a subject or career. With this research in mind I decided to look at subject perceptions in a broader sense, rather than narrowing it down to girls alone.

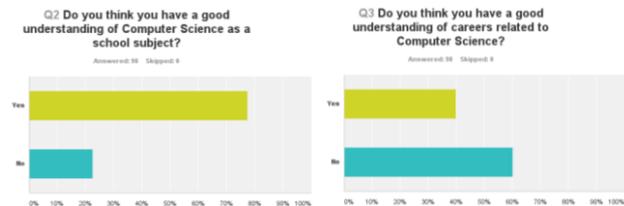
Further research allowed me to develop ideas on how I should gather evidence. A questionnaire by Galpin & Sanders (2006) formed the basis of my questions including closed, response to statements (Likert scale) and questions gauging interest / knowledge of specific Computer Science course elements and careers. The book 'Little Miss Geek' (Parmar, 2012) also inspired me to use the 'three words' response to sum up thoughts / opinions as well as the idea of 'Drawing a Computer Scientist' which I issued as a homework task.

Gathering Evidence

My research was carried out via an online survey using Survey Monkey. It was given to four year 7 groups (98 students). The gender balance was almost even (boys 52%, girls 48%). Students accessed the survey in a lesson where they were encouraged not to talk to each other in order to help ensure an independent response. The HW task was also set in this lesson, and was left open-ended in its wording. I was aware, however, that the result may be more influenced by others giving advice on how to complete the task added to the assistance that a Google image search may offer.

Findings

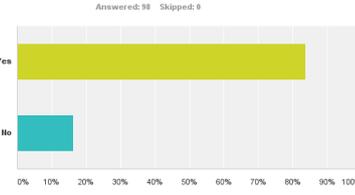
(Q2) & (Q3) together show the disparity between students' understanding of Computer Science as a subject against that of a career with a clear switch from 'yes' to 'no' when looking at subject, then career respectively. It is also interesting to note that 22% of students felt they did not have a good understanding of the subject itself and maybe indicative of the difference in experiences at Primary School, i.e. the amount and quality of exposure to the subject / skills.



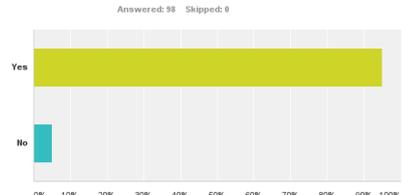
(Q7) results show that students feel confident using technology generally, and their interest in new technologies (Q8) is very high, suggesting that they see it in a positive light; something that can potentially be developed and tapped into.

What isn't clear however, is how they have interpreted the word 'technology' in making their choice, for them it might mean the latest smartphone or games console which does not necessarily translate into a positive attitude towards studying Computer Science.

Q7 Are you confident using technology?

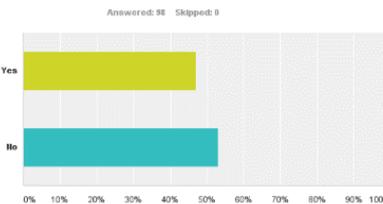


Q8 Are you interested in new technologies?

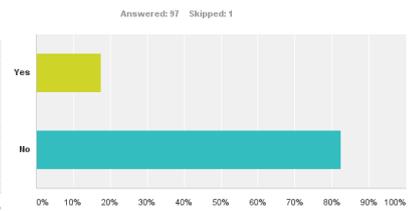


(Q9) shows that students are still arriving at Secondary School with a mixed experience of coding, although this % is perhaps higher than it once may have been. (Q10) suggests that they have not actively been encouraged to pursue Computer Science up to now and echoes what we hear anecdotally from students in conversations about influences both at Primary School and at home. Experience of coding in particular may be due to a particular leaning of a teacher or an interest of someone they know whether that is a parent, friend or another family member. This could also warrant further investigation.

Q9 Have you any experience of programming/ coding?



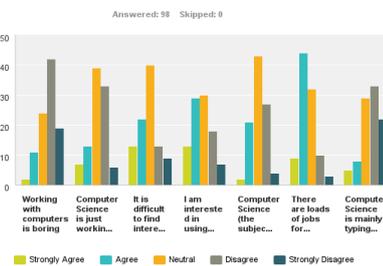
Q10 Have you ever been encouraged to study Computer Science?



Q11 used the Likert scale to gather student responses to a series of statements (listed below).

- Working with computers is boring
- Computer Science is just working with machines not people
- It is difficult to find interesting jobs in Computer Science
- I am interested in using computers not learning about the computer itself
- Computer Science is mainly programming
- There are loads of jobs for people who have studied Computer Science
- Computer Science is mainly typing words into the computer

Q11 Please enter your response to the following statements:

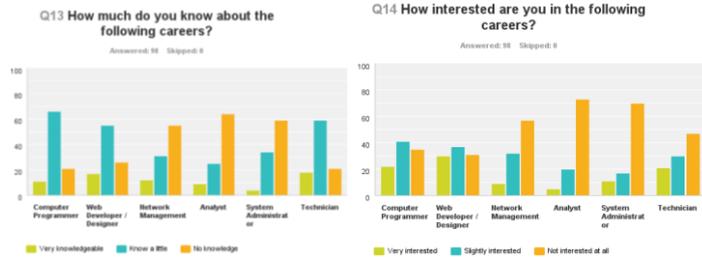


Where 'neutral' is clearly the largest response it perhaps indicates that students do not have enough knowledge to give a more opinionated answer. In contrast students clearly concluded that working with computers is not boring, again perhaps reflecting their earlier expression of interest in using computers / new technology. They also seem to grasp that Computer Science doesn't equate to 'typing words into a computer'. There is also strong agreement that there are lots of jobs available for students of Computer Science which backs up the anecdotal view that computing is 'good for a job' which is often something we hear when year 8 students are discussing options. There is a greater spread of responses to the statement asking about interest in using /learning about computers, reflecting the divide which is common amongst students.

Findings

(Q13) & (Q14) compare student knowledge/ interest in particular careers and perhaps predictably show that students are not very knowledgeable about the diverse roles within the industry. They know something about the more visible careers such as programmer, web developer / designer and technician but little about other roles. This is also perhaps why some of the 'not interested' scores are higher, in that they are based on little knowledge of what the job entails.

Added to this, the interest scores are relatively healthy for both programmer and web-related careers and reinforces that there is a body of enthusiasm within year 7 that can be nurtured further in the curriculum. They seem less interested in the role of technician however which may reflect the fact that they are less concerned with how computers work (although this may be worthy of further investigation).



(Q15) asked students to summarise their thoughts on Computer Science in three words. There were no limitations or directions as to what they should write which meant they revealed a number of different interpretations.

There were also a few responses that were deleted, for example if the student chose to enter 'IT IS BORING' as their three words then I have disregarded the first two. In retrospect this may have been worth explaining to them as they completed the survey, along with making it a required response (not doing so meant that the occasional student did not write all three words before submitting their completed survey).

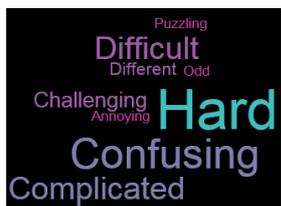
In analysing the responses I noted that the words fell roughly into a clear positive or negative opinion, there were a few that could be described as more neutral words such as 'ok' and then a significant cohort who chose words to describe content such as 'computer' or 'programming'. Lastly there were a significant section of words which highlighted how difficult they thought the subject was.

The positive words, as represented by the word cloud below (88 responses in total), shows that the most common responses were 'Interesting' (said 33 times) and 'Fun' (said 31 times). It is also worth noting that the positive words overall outnumbered those with a negative opinion.

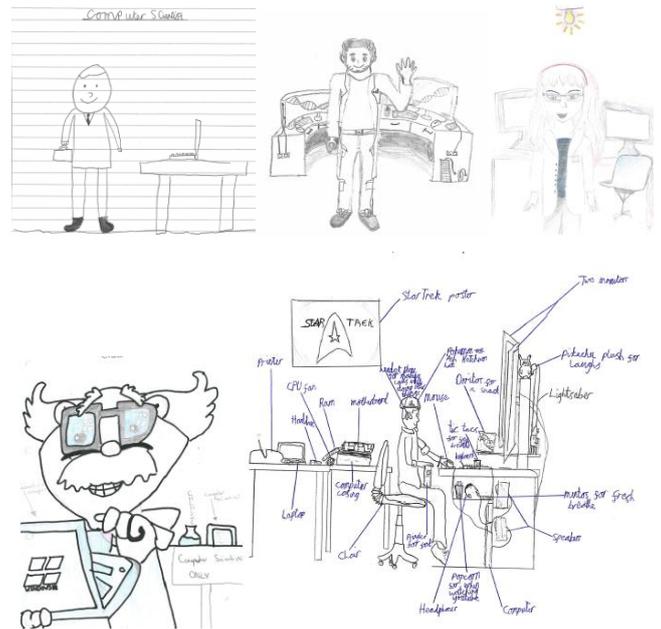


By far the most common negative word (said 22 times) was 'boring' and the word 'bland' also expressed a similar view. There were also a few stronger terms used, including 'hell!' The negative words as a total represented 36 responses.

Perhaps most interest is the perception of the subject as being challenging to study. This group of words accounted for 42 responses, the most popular choice being 'hard'. If we factor in the earlier question suggesting that their experience of Computer Science is often limited, then it is perhaps not a surprise that they may see the subject as a daunting one. It is worth considering this angle though as we attempt to de-mystify what they may perceive as the challenges. Indeed one student used the word 'mysterious!'



The 'Draw a Computer Scientist' HW task offered a visual indication of students' perceived understanding. The selection of images below represent some of the main ideas collected.



Most students drew male characters, often wearing glasses. There was often a clear indication of the 'Science' as shown by safety equipment, lab coats and sometimes chemical flasks. Some students preferred to draw characters in a purely computer-based surrounding, these tended to be dressed in more modern clothes, with a cooler image. Others drew pictures that resembled a teacher-like persona. There were also a couple that went into minute detail about the character and the environment they had drawn them in.

Conclusions

Year 7 students seem to have a keen interest in new technology / computers and they feel confident in their use of them. Perceptions of the subject of Computer Science vary but are largely positive, although some students remain wary as they see it as very challenging subject to study; perhaps suggesting a fear of the unknown.

Additionally, there is evidence to suggest that student exposure to Computer Science before starting Secondary School differs greatly and students have little knowledge of careers beyond those surrounding web development. Their perceptions of the role of Computer Scientist are also often driven by stereotypes (although there are exceptions to this).

There are many positive points to consider as a teacher of Computer Science, confirming the idea (as stated earlier the research carried out for Google) that we should grasp the opportunity to deliver meaningful exposure to the skills and career opportunities available. As such, it would be worth considering a clear vocational element within the curriculum to allow students to develop a greater understanding of the diversity of this sector. This could also be enhanced by considering trips or by bringing in relevant industry representatives to help dispel any misconceptions.

Lastly, the move from IT to the development of a more specific Computer Science focus in the curriculum is a beneficial one, and should seek to get our year 7 students up to speed on basic coding / computational thinking as soon as possible. This, in turn, will allow students to make a more informed choice when opting in year 8 and will help them feel more confident in tackling the subject.

Further Recommendations - There are a number of avenues which would be worthy of further research:

1. Going into more depth about where the clear interest in technology lies, e.g. is it the latest phone or is it a desire to learn more about programming etc.?
2. More investigation of their previous experience of Computing and the influences that may have shaped the perceptions they have displayed.