

Big Picture teaching resource

Reviewing how teachers, educationalists and young people access and use classroom resources



In spring 2012, the Wellcome Trust evaluated *Big Picture*, its free publication on bioscience, and explored ways in which it could be developed. We hope that this summary of the main findings will be of use to other organisations developing materials for teachers and students, particularly those interested in offering resources online or for other interactive devices, including mobile phones and whiteboards.

Some key points were realised:

- The publication was rated highly for both appearance and content, and those who read it would be likely to recommend it to others.
- Teachers use it during lessons for background information or for lesson plans. It was rated highly as a teaching resource.
- Only 50 per cent of respondents were previously aware of the website, meaning it is underused, although those who use it said they would recommend it to others.
- 83 per cent of teachers used videos from websites such as YouTube in lessons, but awareness of Big Picture videos was only 30 per cent.
- 85 per cent of teachers used the internet in lessons at least a few times a week.
- 45 per cent of teachers had attended a Science Learning Centre CPD course and 41 per cent had attended no educational courses or events in the past year.

Background

Big Picture is a free educational resource, which has been produced by the Wellcome Trust since 2005. The magazine is freely available as a hard copy and as a PDF, which can be downloaded from the Big Picture website. The online content offers additional material such as lesson ideas, curriculum links, articles, films and animations that can be downloaded separately.

Big Picture is targeted at post-16 biology teachers and provides up-to-date information on research findings in biomedicine, as well as examining the social and ethical implications of this research. It is published twice a year, and each issue covers a specific theme, which is explored in-depth in the magazine and via additional exclusive online content.

Subscriber numbers to the magazine have increased from 728 to more than 9000 in the past three years. Furthermore, three issues with an initial print run of around 14 000 have had to be reprinted to meet demand, so we now start with a higher initial print number. Web traffic has also improved in the past three years and now accounts for 5 per cent of visits to the Trust's website.

The 2012 evaluation

An evaluation has been carried out on *Big Picture* in the form of an online survey. This was aimed at *Big Picture* subscribers, including teachers and non-teachers, but was available for anyone to complete through the Big Picture website. The following report discusses the results of this evaluation, as well as the results from a small number of focus groups with teachers and young people.

Evaluation introduction

Aims of survey

The survey aimed to find out more about how people use *Big Picture*, as well as highlighting useful points relating to additional resources teachers use (e.g. the internet, social media). The evaluation will be used to try to understand teachers' online habits and preferences in a more general sense and to guide future strategy.

Methodology

The Evaluation and Assessment team at the Wellcome Trust carried out a survey that was emailed to 6439 UK subscribers and was also available online on the Big Picture website for anyone to access.

The subscriber survey was emailed on 15 March 2012 and was closed on 12 April, giving four weeks for respondents to complete the survey. The open survey also went live on 15 March and closed on 17 April. A total of 724 complete responses were collated from the subscriber survey, and six were collated from the open survey.

Four focus groups were also commissioned and were carried out by Opinion Leader. Two were made up of post-16 students and contained eight people per group, and two were made up of teachers and contained six people per group. The students and teachers were from various backgrounds; some of them were subscribers to *Big Picture* and some weren't. The questions asked were chosen from areas in the survey that needed to be explored further.

Structure of report

The results are outlined here and have been grouped into topics corresponding to how the survey itself was conducted. The topics include teachers' use of *Big Picture* and other resources, general aspects of *Big Picture* and Big Picture online. Within each subheading, a main point is outlined followed by more detailed results. At the end of each section, a short conclusion summarises the findings.

Important learning points reflecting issues that are not specific to *Big Picture* are highlighted in boxes.

Finally, a general conclusion brings together the key points of the evaluation, and future developments are discussed.

All comments have been anonymised. In most cases, descriptors of respondents are listed as 'teacher', 'non-teacher' or 'non-teacher (student)'. When grouped into age categories, this is indicated. The percentages may have been rounded and therefore do not always total 100 per cent. For some questions, it was possible to select more than one answer, which is reflected in the percentages seen.

Results

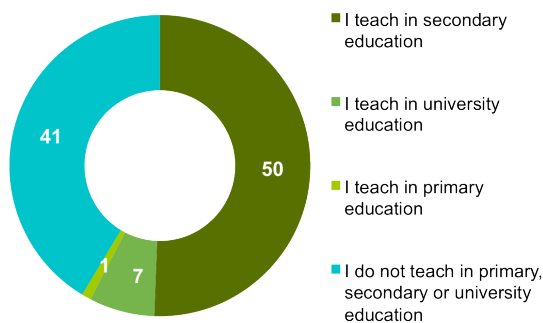
Section 1: Respondents

Consistent with the target audience of *Big Picture*, almost 60 per cent of respondents described themselves as ‘teachers’. Of the remaining ‘non-teachers’, 39 per cent currently worked in the education sector and 20 per cent were students, demonstrating that the majority of respondents are involved in education.

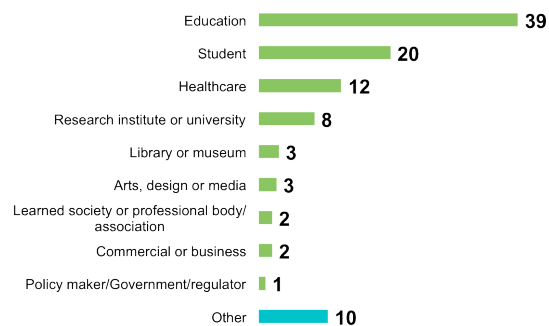
As shown below, key points on respondents’ profiles are outlined:

- Most teachers work in a comprehensive school. Overall, more than 80 per cent teach at a secondary level or in a further education college.
- The majority of teachers teach biology or combined science.
- 60 per cent of teachers had been teaching for more than ten years.
- 71 per cent of respondents were female.
- There was a broad range of ages, but the majority of respondents were above the age of 35.

All respondents:

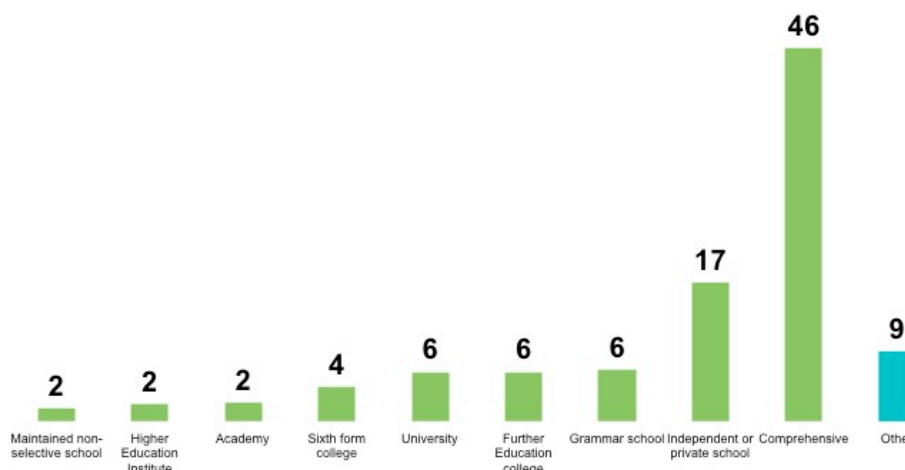


Non-teachers’ sector:



Teachers’ profiles

Teachers’ institution type:



Section 2: General aspects of *Big Picture*

Respondents were asked to comment on how they found out about *Big Picture* and on the appearance and content of the magazine. Several themes were raised within this section, as well as specific quotes highlighting positive and negative aspects.

94 per cent of respondents read the paper copy of *Big Picture*, although 1 in 4 also read the online version. These results were similar across teachers and non-teachers, but only 8 per cent of respondents under the age of 18 read the PDF copy. 92 per cent of teachers were likely to read *Big Picture* in some detail.



www.wellcome.ac.uk/bigpicture

There is a strong preference for paper copies among teachers, which suggests print may be the best way of engaging with them – despite the trend of putting teaching resources online.

General

The majority of respondents discovered *Big Picture* through the Wellcome Trust website or through a colleague, and 75 per cent were likely to recommend it to others. Interestingly, recommendation was almost as high for non-teachers as for teachers, although students were slightly less likely to recommend it to others. Non-teachers mainly use *Big Picture* for their own interest and are likely to share it with an average of two people.

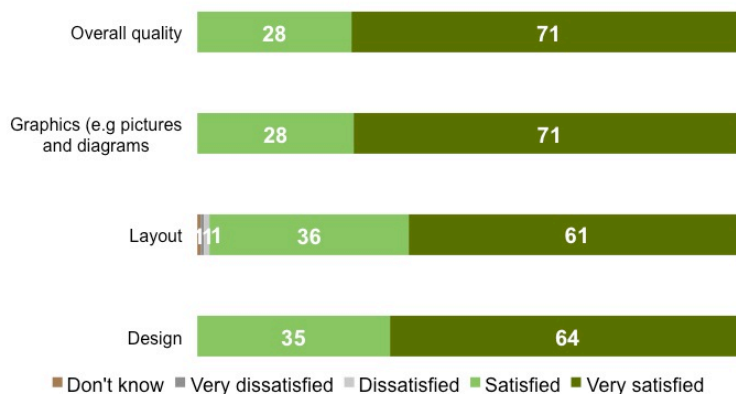
How likely respondents are to recommend *Big Picture* to others:



Appearance

The overall quality was rated with almost 100 per cent satisfaction across the board. This was also true of most aspects of the appearance of *Big Picture*, including graphics, design and layout.

Satisfaction with the appearance of *Big Picture*:



Respondents were asked to comment further on the appearance of *Big Picture*, and some of the key themes that emerged are listed below.

Positive

- Accessible
- Quality
- Attractive
- Well designed

Negative

- Too busy
- Boring for younger audiences

“The short articles are brilliant for the students that I teach, who all have autistic spectrum disorder. The high quality of the visual illustrations really helps them to understand.”

Teacher

“Brilliantly presented, with very clear language and interesting content.”

Non-teacher

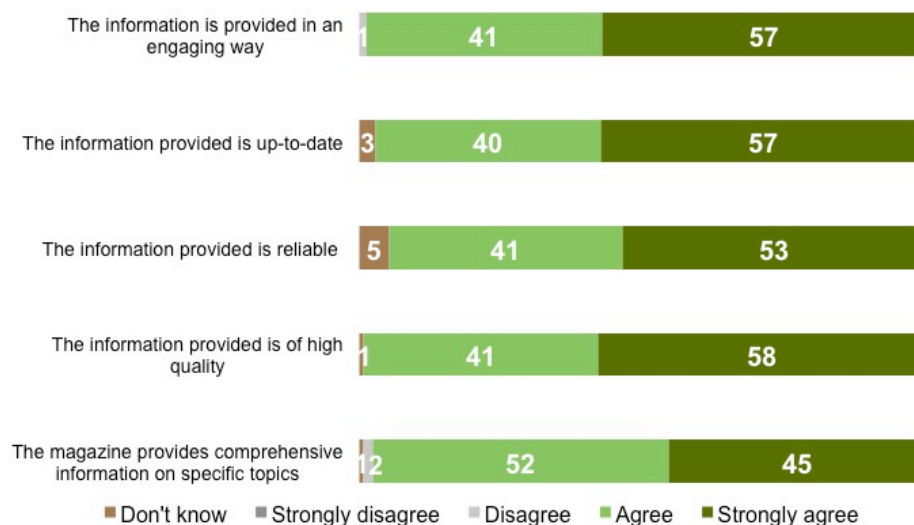
“Illustrations are good, thought provoking at times and informative.”

Teacher

Content

Like the appearance of *Big Picture*, the content was rated extremely highly in several areas. The engaging nature of the material was rated highly for all respondents, similar to the quality of the content and the comprehensive description of specific topics. Although they were rated with up to 93 per cent satisfaction, there was some uncertainty regarding the reliability and up-to-date nature of the articles, particularly among non-teachers (although they might not have felt that they were in a position to judge).

Satisfaction with the content of *Big Picture*:



Some of the key themes that emerged when respondents were asked to expand on their opinion of *Big Picture* content are listed below.

Positive

Relevant

Accessible

Trusted

Engaging

Negative

Unsure of validity

Depth too little/too much

“For the non-expert level that is the ‘audience’ in my case, it gives an exciting, accessible way to engage with the topics.”

Teacher

“The students like the information so it must be engaging. I trust the source so I assume it is accurate. The information is wide ranging for each topic area. The statistics given are up to date.”

Teacher

In addition, respondents were asked about the characteristics of *Big Picture* that they find most useful, as well as what they might change. Many respondents stated that they were happy with *Big Picture* as it is and there is no need to change it, although some gave specific suggestions. The most popular themes are shown below.

Most useful

Change

Format/accessibility

Frequency of issues too low

Topical

More focus

Variety

Links to further reading

Curriculum focus

Copy for younger students

Posters/diagrams

Depth of information

“Topical issues dealt with in an interesting and thought-provoking way, unlike textbooks.”

Teacher

“Sometimes needs a bit more scientific detail in order to provide stretch and challenge.”

Teacher

The focus groups were asked some specific questions about the presentation of *Big Picture* articles. On the whole, the response was positive.

The general findings about the presentation of articles were:

- responses were positive in general
- respondents were positive about the current text size, but would prefer more text with smaller graphics over less text with larger images.
- smaller introductions and the clear separation of articles were important.

“I think it is very interactive, it is really friendly; I think students can understand, it is practical.”

A-level teacher

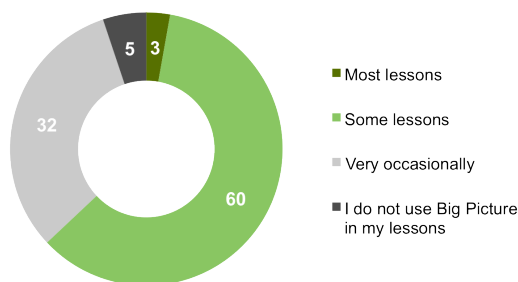
In conclusion, respondents were satisfied with most general aspects of *Big Picture*. The appearance in particular received little criticism, and the content received a few minor comments, often regarding younger and older audiences. In general, the paper copy was used most.

Section 3: Teachers' use of *Big Picture*

The next set of questions were only given to teachers and focused on how *Big Picture* is used in lessons, as well as the frequency of use. It also covered how copies of *Big Picture* are shared among colleagues or friends and family, and which specific issues teachers found most useful.

Use in lessons

60 per cent of teachers said they used *Big Picture* in 'some lessons'. The small percentage that did not use *Big Picture* were then asked to comment on why they don't and/or what would make them more likely to use the magazine in their lessons (some of their quotes are shown below).



"More competitions for pupils to enter."

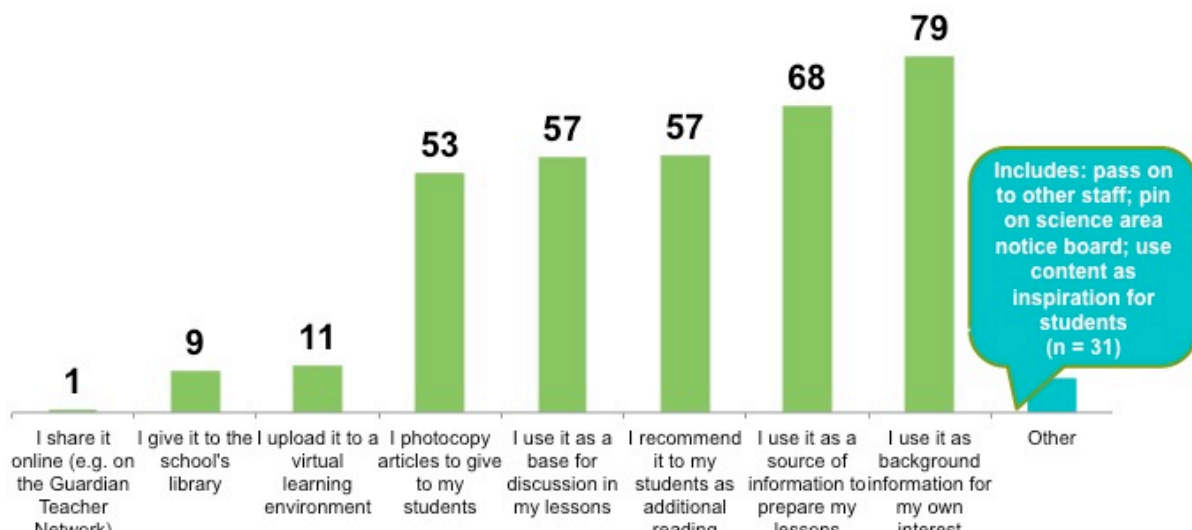
*"Multiple copies."**

"Not specific to National Curriculum guidelines."

*Multiple copies can be ordered online, and all issues can be downloaded as a PDF.

Considering the vast majority of respondents occasionally used *Big Picture* in lessons, we were interested to find out what would encourage those who didn't. Several themes emerged, including wanting issues suited to a younger or older age range (specifically, primary school or undergraduate teaching). Others suggested that more resources should be available for download, such as PowerPoint slides and quizzes.

How teachers use *Big Picture*:



Of those who use *Big Picture*, shown in the chart above, most use it as background information, either for their own interest or for lesson plans. It is also widely used as an additional resource for students as a base for discussion or as additional reading.

Teachers tended to share their copies with post-16 students or colleagues, and only 5 per cent stated they did not share their copy at all.

A wide range of topics have been covered in different issues of *Big Picture*. Respondents were asked to choose the issues that they used most in lessons. The top five responses were:

- 'The Cell' poster (a free, full-sized poster that came with the issue 'The Cell' and is available as a PDF online)
- 'The Cell'
- 'Obesity'
- the *Big Picture Little Book of Fast Facts* (a book that brought together the best of the 'fast facts' from 14 issues)
- 'Food and Diet'



Other frequently used issues were 'Exercise, Energy and Movement', 'Evolution', 'Genes, Genomes and Health', and 'Drug Development'. The three least-used issues were 'How we Look', 'Music, Mind and Medicine', and 'Thinking'.

In conclusion, teachers were found to use *Big Picture* as an aid to their background knowledge or lesson plan, and it was used reasonably regularly. The issues varied widely in popularity.

Section 4: Big Picture online

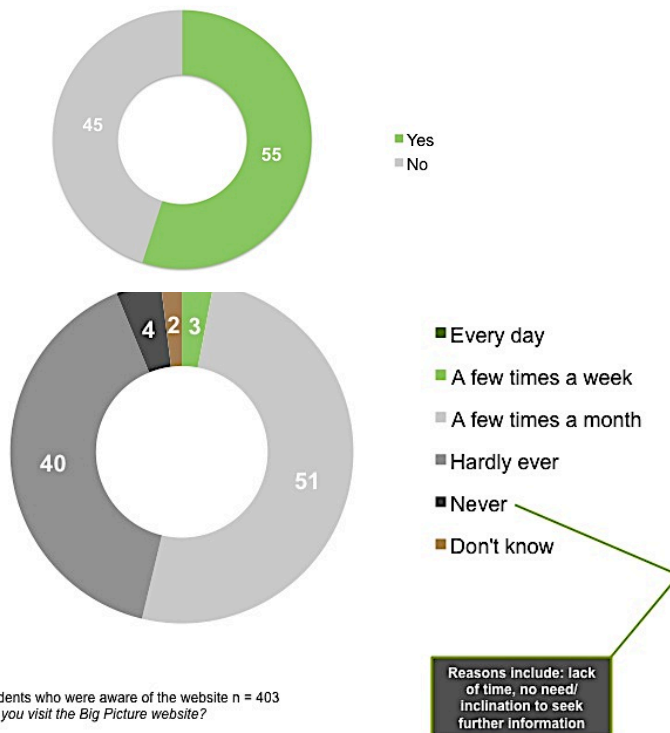
The following section looks at awareness, use and usefulness of the Big Picture pages and videos on the Wellcome Trust website (www.wellcome.ac.uk/bigpicture), and what respondents would most like to change.

Awareness of the website was approximately 50 per cent among respondents, and those who were previously aware of it tended to use it only a few times a month or less (see below). When teachers visit the website,

they mostly use it for animations, for videos, to download PDF copies of issues or for lesson ideas. There were a few available resources that were under-used by teachers, ordering extra hard copies and curriculum links in particular. Posters, online image galleries and online-only articles were also less widely used than the aforementioned animations.

Recommendations to others were high among all respondents, and those who were previously unaware of the website stated they would now like to visit it.

Awareness of the *Big Picture* website - ALL (%)



Base: All respondents who were aware of the website n = 403
 Q: How often do you visit the Big Picture website?

Below are the main themes that emerged when respondents were asked what they find most useful and what, if anything, they would change.

Most useful

Change

Extra online content

Improve design

Ease of access/download materials

More/better interactive resources

Comprehensive

More for older/younger students

Lesson ideas

More links to further information

Previous issues

Relevant

Ability to share with others

“Facts are easily accessible and are presented at the right level for a non-specialist.”

Teacher

“Lots of extra information and resources to accompany each issue, allowing for more effective and fun use in the classroom.”

Teacher

“Worksheet-type resources that can just be printed off... More use of the magazine can be made if there were tailored tasks to do for students based on or around the articles.”

Teacher

“As I am colour blind, some of the text and background combinations make it difficult for me to read.”

Teacher

Big Picture videos are also featured as a resource for teachers or for general interest, and respondents were asked to comment on their awareness of these. When respondents were asked whether they were aware of Big Picture videos before the survey, only 31 per cent said they were; of these, most used the videos only occasionally. The most popular videos among those who used them were:

- *Working with Cells*, a video of a PhD student who works with cells for her research
- *Types of Microscopy*, a set of three videos showing how different microscopy techniques are used
- *How Digestion Works: Mechanical stomach*, in which a mechanical stomach shows how the human stomach works.

Those teachers who already used Big Picture videos in lessons were likely to recommend them to others, and those who were not aware of the videos were now likely to visit the website to watch them.

The most popular educational resource for teachers was found to be videos, and 83 per cent use videos in at least some lessons. Currently, YouTube is the most popular video source: 97 per cent use it to find videos. 35 per cent of teachers said they used the Times Educational Supplement to source videos. Other popular resources include websites and animations.

In conclusion, only half of respondents were previously aware of the website, and use was quite low. However, those who did use the website said they would recommend it to others.

Section 5: Teachers' use of *Big Picture*, and their use of the internet and other technologies in lessons

This section will give an overview of the use of *Big Picture* within teaching, as well as expanding into teachers' general use of other technologies while teaching. To understand where *Big Picture* fits within teachers' resources, it is important to understand which resources teachers use most frequently.

Big Picture as a teaching resource:

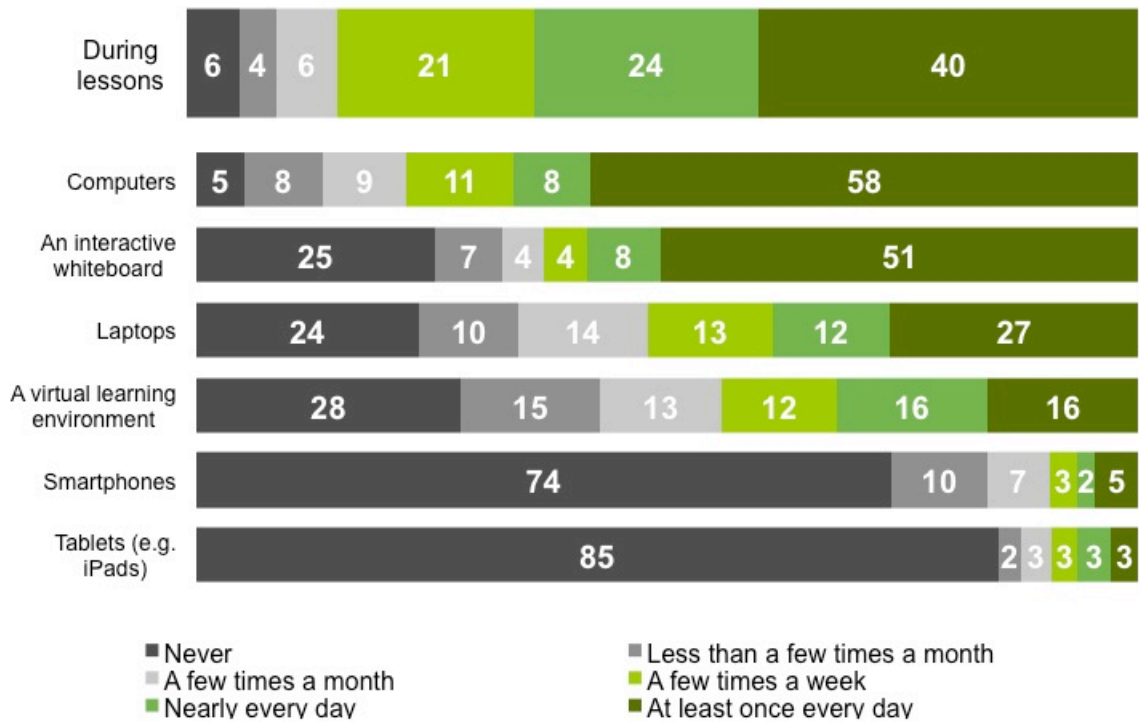
Statement	Agree ^a	Disagree ^a
The content is relevant to the curriculum	92%	2%
The content is at the right level for people aged 16–19	93%	2%
The content is appropriate for older age groups, such as undergraduates	57%	14%
The content is appropriate for younger age groups, such as people aged 14–16	76%	14%
The content is easy to integrate into lessons	86%	6%
The balance between science, social and ethical issues is about right	93%	3%

^a The remaining respondents answered 'Don't know' or 'Not applicable'.

The above results show an overall positive response to the content of *Big Picture* in the context of teaching, and it is evident that it is most appropriate for post-16 students.

The charts on the following page show how much teachers use the internet and other technologies during lessons. 85 per cent use the internet regularly in lessons, and more than half use computers and interactive whiteboards. Tablets and smartphones are used much less often.

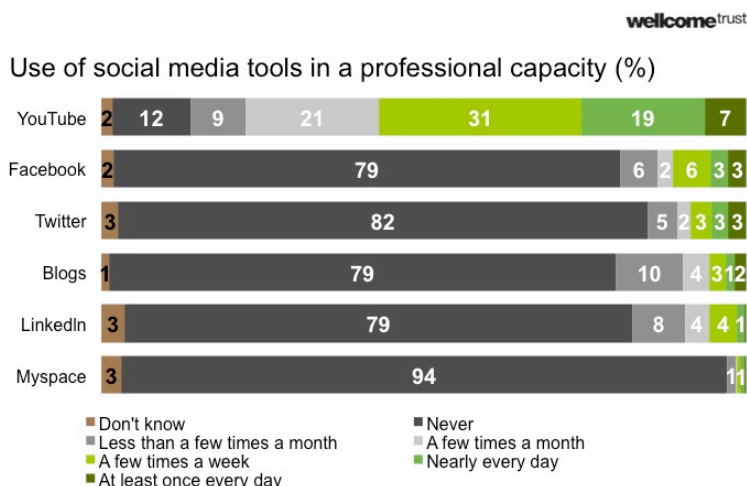
Use of internet:



As shown, most teachers used the internet at least a few times a week during lessons, mostly using computers or an interactive whiteboard. It should be noted that the survey was conducted online and, therefore, probably included teachers who readily access the internet. There was interest in a website dedicated solely to Big Picture, as well as interactive whiteboard content and educational apps for use on smartphones and tablets. (An app is a piece of software with a dedicated purpose, usually for use on mobile phones and/or tablets.)

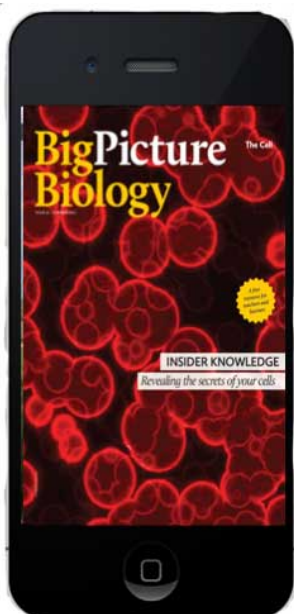
The use of social media tools is low among teachers, as shown by the graph below.

The only social media site used regularly by teachers is YouTube, although the focus groups were more positive about apps.



Base: All teachers n = 430
 Q: How often, if at all, do you use the following social media tools in a professional capacity?

In light of the above results, we decided to concentrate on respondents' interest in educational apps or interactive whiteboard content in the focus groups.



Responses to the idea of a Big Picture app:

- Students use apps more than teachers.
- Teachers are presented with certain barriers to use – not everyone has smartphones, and they are often not allowed in school. Twitter is not seen as appropriate.
- Teachers said they were likely to recommend an app for use outside of school.
- Students already use educational apps in some form, and they were keen to see a Big Picture app.

Content recommendations included:

- Diagrams
- Fast Facts
- Animations
- Quizzes
- Links to articles.

Responses to the idea of interactive whiteboard content:

- Very positive. A-level students still enjoy the fun and interactive resources used lower down the school.

“We used to have a lot of animations for biology and chemistry to show visually a process that you might not understand otherwise.”

Male biology student

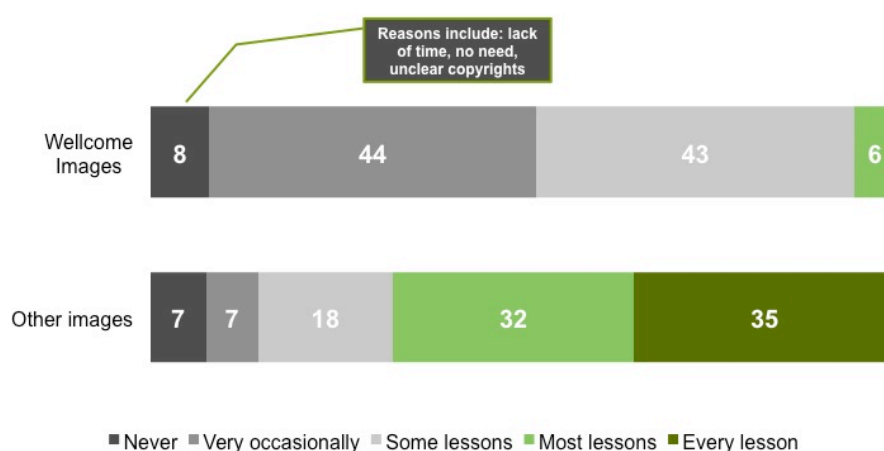
In conclusion, *Big Picture* was rated very highly as a teaching resource for post-16 students among respondents, scoring highly across several topics. Computers and laptops were most commonly used as teaching aids, and a Big Picture microsite was seen to have the most potential as an extra

resource. The focus groups were keen on an app and interactive whiteboard content.

To move forward, we have begun to develop a Big Picture app that will be available as a web app (which can be used on a computer) or on tablets and/or smartphones if teachers have access to them.

Section 6: Wellcome Images

A short set of questions were also asked on the Wellcome Trust's online medical image library, Wellcome Images, which is free to use for educational purposes. The results clearly showed a lack of awareness (only 38 per cent) and very low use of this resource.



67 per cent of all teachers said they used images in most lessons or in every lesson. Of teachers who were previously aware of Wellcome Images, only 6 per cent used them regularly. Other image resources specifically mentioned by teachers include Google Images and BBC Wildlife Finder.

Section 7: Educational events and courses

The following section includes answers only from teachers and concentrates on educational events they have attended in the past year.

Science Learning Centre Continuing Professional Development (CPD) courses were the most frequently attended of five events and courses:

- Science Learning Centre CPD courses (45 per cent)
- Association for Science Education (ASE) regional events (12 per cent)
- ASE national events (11 per cent)
- Big Bang Fair (10 per cent)
- BETT conferences (5 per cent).

A large proportion of respondents (41 per cent) had not attended a course at all in the past year.

When looking at the duration of time that respondents had been teaching, around 50 per cent of each bracket (less than a year, 1–4 years, 5–9 years, etc.) had attended a Science CPD course, showing an even spread across the board.

Science Learning Centre CPD courses are the most heavily attended: around 50 per cent of respondents had attended one in the past year.

Section 8: *Big Picture*: the name

Respondents were asked their opinion of the name 'Big Picture', as well as whether they thought it represented the content of the magazine fully and whether they would change it.

84 per cent of respondents said they liked the name. When asked whether it reflected the content of the magazine, 88 per cent of teachers agreed that it did, although fewer non-teachers agreed with this. Most respondents were neither in favour of nor opposed to changing the name, although those that did have an opinion either way gave some specific reasons.

Focus group participants were also asked about the name and magazine cover in general:

- respondents were asked to pick their favourite magazine cover and to assess which names and pictures stood out for them.
- overall, students and teachers agreed the name should continue to be *Big Picture*
- the most popular magazine covers were simple, colourful and recognisable.



"It was simple, yet it was eye-catching. It just stood out."

Male student

Conclusions

The data collected in this survey highlight some of the key positive and negative aspects of *Big Picture*, primarily as an educational resource for teachers and students but also as reading material for non-teachers with an interest in science. In addition, many interesting points have arisen regarding teachers' general use of educational resources and different forms of technology. The report also gives an insight into how *Big Picture* is used by teachers, students and other people and some improvements that could be made.

Key points for teachers' general use of resources:

- There is a strong preference for the paper copy of the publication over the downloadable PDF copy.
- Currently, the videos teachers use are mostly found via YouTube and are the most popular educational resource.
- 67 per cent of all teachers said they used images as a resource in lessons.
- Teachers regularly use the internet during lessons, usually via computers or an interactive whiteboard. Interactive whiteboard content was extremely popular in the focus groups.
- The concept of educational apps was popular, particularly among students who already used similar resources, as seen in the focus group.
- Around 50 per cent of teachers had attended a Science Learning Centre CPD course in the past year, and around 40 per cent had not attended any courses or events.

Key points for the response to *Big Picture*:

- Respondents were as expected – the majority were teachers, students and educational professionals.
- There was a high level of satisfaction with the general appearance and content of *Big Picture*. Respondents found the accessible and topical content alongside the background information most useful, and if they could change anything, they would increase the frequency of issues.
- *Big Picture* is used in lessons for background knowledge or as an aid for lesson planning. Teachers tended to share their copy with A-level students and colleagues.
- Website use was low: awareness was around 50 per cent. The main reason for teachers' visits to the website was the animations and other

resources, whereas for non-teachers it was just to browse. Of those who already visited the website, a majority would recommend it to others.

- *Big Picture* was rated highly as a teaching resource in many areas, including relevance to the curriculum, balance between science and ethics, and how age appropriate its content is.
- A Big Picture microsite was seen to have the most potential of all the internet or social media tools that were suggested.

Wellcome Trust

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