12 ICT IN THE FUTURE

This unit provides an opportunity for revision of many of the concepts and vocabulary items used in the book in the context of the future of ICT. Some new vocabulary relates to different aspects of ICT, but much of it follows on naturally from earlier chapters.

Skills focus

Reading

- understanding how ideas in a text are linked

Writing

- deciding whether to use a direct quotation or a paraphrase
- incorporating quotations
- writing research reports
- writing effective introductions/conclusions

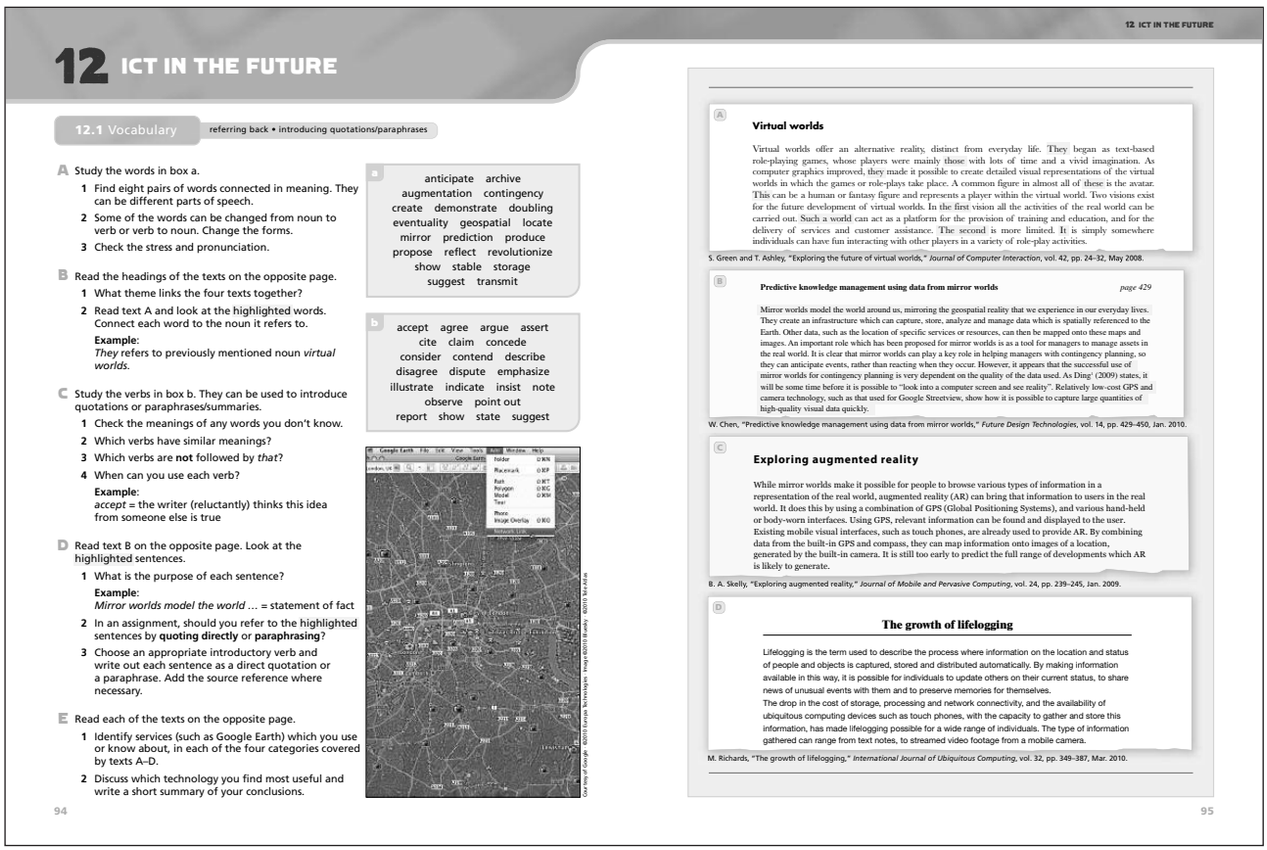
Vocabulary focus

- verbs used to introduce ideas from other sources (*X contends/suggests/asserts that …*)
- linking words/phrases conveying contrast (*whereas*), result (*consequently*), reasons (*due to*), etc.
- words for quantities (*a significant minority*)

Key vocabulary

annotation tools
archive
augmentation
augmented reality
avatar
contingency planning
eventuality
geospatial
global positioning systems (GPS)
growth curve
infrastructure
lifelogging
mirror
mirror worlds
Moore's law
neural networks
persistent trend
physical reality
prediction
reflect
revolutionize
role-play
scan
stable
storage
transmit
ubiquitous computing
virtual worlds
virtually enhanced
wearable computer

12.1 Vocabulary



12 ICT IN THE FUTURE

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12.1 Vocabulary referring back • introducing quotations/paraphrases

A Study the words in box a.
1 Find eight pairs of words connected in meaning. They can be different parts of speech.
2 Some of the words can be changed from noun to verb or verb to noun. Change the forms.
3 Check the stress and pronunciation.

a
anticipate archive augmentation contingency create demonstrate doubling eventuality geospatial locate mirror prediction produce propose reflect revolutionize show stable storage suggest transmit

B Read the headings of the texts on the opposite page.
1 What theme links the four texts together?
2 Read text A and look at the highlighted words. Connect each word to the noun it refers to.
Example:
They refers to previously mentioned noun *virtual worlds*.

C Study the verbs in box b. They can be used to introduce quotations or paraphrases/summaries.
1 Check the meanings of any words you don't know.
2 Which verbs have similar meanings?
3 Which verbs are **not** followed by *that*?
4 When can you use each verb?
Example:
accept = the writer (reluctantly) thinks this idea from someone else is true

b
accept agree argue assert cite claim concede consider contend describe disagree dispute emphasize illustrate indicate insist note observe point out report show state suggest

D Read text B on the opposite page. Look at the highlighted sentences.
1 What is the purpose of each sentence?
Example:
Mirror worlds model the world … = statement of fact
2 In an assignment, should you refer to the highlighted sentences by **quoting directly** or **paraphrasing**?
3 Choose an appropriate introductory verb and write out each sentence as a direct quotation or a paraphrase. Add the source reference where necessary.

E Read each of the texts on the opposite page.
1 Identify services (such as Google Earth) which you use or know about, in each of the four categories covered by texts A–D.
2 Discuss which technology you find most useful and write a short summary of your conclusions.

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A
Virtual worlds
Virtual worlds offer an alternative reality, distinct from everyday life. They began as text-based role-playing games, whose players were mainly those with lots of time and a vivid imagination. As computer graphics improved, they made it possible to create detailed visual representations of the virtual worlds in which the games or role-plays take place. A common figure in almost all of these is the avatar. This can be a human or fantasy figure and represents a player within the virtual world. Two visions exist for the future development of virtual worlds. In the first vision all the activities of the real world can be carried out. Such a world can act as a platform for the provision of training and education, and for the delivery of services and customer assistance. The second is more limited. It is simply somewhere individuals can have fun interacting with other players in a variety of role-play activities.
S. Green and T. Ashley, "Exploring the future of virtual worlds," *Journal of Computer Interaction*, vol. 42, pp. 24–32, May 2008.

B
Predictive knowledge management using data from mirror worlds *page 429*
Mirror worlds model the world around us, mirroring the geospatial reality that we experience in our everyday lives. They create an infrastructure which can capture, store, analyze and manage data which is spatially referenced to the Earth. Other data, such as the location of specific services or resources, can then be mapped onto these maps and images. An important role which has been proposed for mirror worlds is as a tool for managers to manage assets in the real world. It is clear that mirror worlds can play a key role in helping managers with contingency planning, so they can anticipate events, rather than reacting when they occur. However, it appears that the successful use of mirror worlds for contingency planning is very dependent on the quality of the data used. As Ding' (2009) states, it will be some time before it is possible to "look into a computer screen and see reality". Relatively low-cost GPS and camera technology, such as that used for Google Streetview, show how it is possible to capture large quantities of high-quality visual data quickly.
W. Chen, "Predictive knowledge management using data from mirror worlds," *Future Design Technologies*, vol. 14, pp. 429–450, Jan. 2010.

C
Exploring augmented reality
While mirror worlds make it possible for people to browse various types of information in a representation of the real world, augmented reality (AR) can bring that information to users in the real world. It does this by using a combination of GPS (Global Positioning Systems), and various hand-held or body-worn interfaces. Using GPS, relevant information can be found and displayed to the user. Existing mobile visual interfaces, such as touch phones, are already used to provide AR. By combining data from the built-in GPS and compass, they can map information onto images of a location, generated by the built-in camera. It is still too early to predict the full range of developments which AR is likely to generate.
B. A. Skelly, "Exploring augmented reality," *Journal of Mobile and Pervasive Computing*, vol. 24, pp. 239–245, Jan. 2009.

D
The growth of lifelogging
Lifelogging is the term used to describe the process where information on the location and status of people and objects is captured, stored and distributed automatically. By making information available in this way, it is possible for individuals to update others on their current status, to share news of unusual events with them and to preserve memories for themselves.
The drop in the cost of storage, processing and network connectivity, and the availability of ubiquitous computing devices such as touch phones, with the capacity to gather and store this information, has made lifelogging possible for a wide range of individuals. The type of information gathered can range from text notes, to streamed video footage from a mobile camera.
M. Richards, "The growth of lifelogging," *International Journal of Ubiquitous Computing*, vol. 32, pp. 349–387, Mar. 2010.

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General note

Read the *Vocabulary bank* at the end of the Course Book unit. Decide when, if at all, to refer your students to it. The best time is probably at the very end of the lesson or the beginning of the next lesson, as a summary/revision.

Lesson aims

- understand deictic reference – pronouns and determiners
- refer to sources: the choice of introductory verb and stance of writer towards reference
- choose whether to quote or paraphrase

Further practice in:

- words and phrases from the discipline

Introduction

1 Revise the following words and phrases from the two previous units. Ask students to say which grammar class the words belong to and to provide definitions of them.

bandwidth (n C/U)
connectivity (n U)
global (adj)
infrastructure (n C/U)
responsibility (n C/U)
security (n U)
social networking (n U)
standards (n C/U)
trust (n U, v)

2 Introduce the topic of the unit: write the words *ICT in the future* on the board. Ask students to consider what this might mean. It may be useful to recycle some material from Unit 5 relating to the history of computing and how change was slow at first and how quickly change now occurs. Elicit from the students what some of these technological changes have been, such as smaller, more powerful processing, memory and storage; faster connectivity and more sophisticated software. Drawing on Unit 11, have a class discussion on some of the uses to which the improvements in computer technology have been put.

Then, as a class, discuss future developments in ICT that students see as possible and desirable.

Explain that because ICT has pervaded so many aspects of our lives, the focus of the lesson will be on specific developments which are predicted for the near future, rather than exploring what is possible more generally in the future, as in science fiction. The lesson will also concentrate on some aspects of the technical developments which make these possible.

Exercise A

1 Set for pairwork. Tell students that not all the words can be paired in meanings. Accept any reasonable answers and feed back with the whole class, checking meanings.

2/3 Set for pairwork. Feed back with the whole class, checking meanings.

Answers

Model answers:

1

anticipate	prediction
archive	storage
augmentation	doubling
contingency	eventuality
create	produce
demonstrate	show
mirror	reflect
propose	suggest

Exercise B

Introduce the idea of textual cohesion, created by referring back to words or ideas already mentioned with pronouns such as *it* and *this* (pronouns and determiners). Say that this is an important way in which the sentences in a text are 'held together'. In reading and understanding it is important to know what is being referred to by such words. You can build up the answers to question 2 by copying Resource 12B in the additional resources section onto an OHT or other visual medium.

Set for individual work and pairwork checking. Feed back with the whole class, building the table on the opposite page. Establish why a writer might use a particular referring word (see table on next page).

Answers

Model answers:

1 From the titles, it should be possible to see that the common theme is future developments in computing. Closer reading should also show that the link between the extracts is the extent to which ongoing developments in technology are making these types of innovation possible.

2/3

Existing form	Part of speech	Alternative form	Definition
an'ticipate	v (T)	antici'pation n (U)	expect something to happen
'archive	n (C)	'archive v (T)	store for documents or data
augmen'tation	n (C or U)	aug'ment v (T)	an addition to something
con'tingency	n (C)		something which may happen, usually used in context of preparation
cre'ate	v (T)	cre'ation n (C)	make
'demonstrate	v (T)	demon'stration n (C)	to show something
'doubling	n (U)	'double v (T)	an increase of 100% in size
eventu'ality	n (C)		something which may happen at some point in the future
geo'spatial	adj		location in relation to the earth
lo'cate	v (T)	lo'cation n (C)	find
'mirror	n (C)	'mirror v (T)	reflect
pre'diction	n (C)	pre'dict v (T)	a guess about the future
pro'duce	v (T)	'product n (C)	cause to happen, occur or exist
pro'pose	v (T)	pro'posal n (C)	suggest or put forward a plan
re'flect	v (T)	re'flection n (C)	mirror
revo'lutionize	v (T)	revo'lution n (C)	to completely change something
show	v (T)		make it possible for something to be seen
'stable	adj	'stabilize v (T)	firm, not likely to change or move, resilient
'storage	n (U)	'store v (T)	place or space for keeping items or data
su'ggest	v (T)	su'ggestion	propose
trans'mit	v (T)	trans'mission n (C)	to send something out, usually signals

2

Virtual worlds offer an alternative reality, distinct from everyday life. They began as text-based role-playing games, whose players were mainly those with lots of time and a vivid imagination. As computer graphics improved, they made it possible to create detailed visual representations of the virtual worlds in which the games or role-plays take place. A common figure in almost all of these is the avatar. This can be a human or fantasy figure and represents a player within the virtual world. Two visions exist for the future development of virtual worlds. In the first vision all the activities of the real world can be carried out. Such a world can act as a platform for the provision of training and education, and for the delivery of services and customer assistance. The second is more limited. It is simply somewhere individuals can have fun interacting with other players in a variety of role-play activities.

Word	Refers to	Comments
those	a previously mentioned noun/noun phrase	• also used with prepositions • in this text 'those' refers to the players who have time on their hands
it, they	a previously mentioned noun/noun phrase	generally refers to the nearest suitable noun previously mentioned or the subject of the previous sentence
this/these + noun	a previously mentioned noun/noun phrase	also used with prepositions
the + noun	a previously mentioned noun	one of several ways in which the choice of article is governed (e.g., *the first vision*)
this	an idea in a phrase or a sentence	• often found at the beginning of a sentence or a paragraph; a common mistake is to use *it* for this purpose • also used with prepositions
such	a previously mentioned noun	meaning is: 'Xs like this'. Note that when referring to a singular noun, *such a X* is used (e.g., *Such a world*).

Language note

Clearly, in this text, there are also relative pronouns which refer back to previously mentioned nouns in relative clauses. However, the grammar of relative pronouns is not covered here.

This is a complex area of written language. The reference words here are commonly found and arguably students should be able to use them in their writing. There are, of course, various other ways to refer back to a word or idea, such as when comparing: *the former … the latter …* ; *some … others …* .

For more information on this, see a good grammar reference book.

Exercise C

1–3 Set for individual work and pairwork. Feed back. Discuss any differences of opinion in question 2 and allow alternative groupings, with reasonable justifications. Establish that not all verbs have equivalents.

4 Discuss this with the whole class, building the table in the Answers section. Point out to students that the choice of introductory verb for a direct or indirect quote or a paraphrase or summary will reveal what they think about the sources. This is an important way in which, when writing essays, students can show a degree of criticality about their sources. Critically evaluating other writers' work is an important part of academic assignments, dissertations and theses.

Point out also that some verbs have a degree of markedness, that is, extra meaning or connotation (as in the final column).

Answers

Possible answers:

2 accept, agree, concede

argue, assert, claim, contend, insist

consider, note, observe, point out, state

disagree, dispute

illustrate, indicate, show

3/4 See table on next page.

		Used when the writer …
accept	that	(reluctantly) thinks this idea from someone else is true
agree	that	thinks this idea from someone else is true
argue	that	is giving an opinion that others may not agree with
assert	that	is giving an opinion that others may not agree with
cite	+ noun	is referring to someone else's ideas
claim	that	is giving an opinion that others may not agree with
concede	that	reluctantly thinks this idea from someone else is true
consider	that	is giving his/her opinion
contend	that	is giving an opinion that others may not agree with
describe	how; + noun	is giving a description
disagree	that; with + noun	thinks an idea is wrong
dispute	+ noun	thinks an idea is wrong
emphasize	that	is giving his/her opinion strongly
illustrate	how; + noun	is explaining, possibly with an example
indicate	that	is explaining, possibly with an example
insist	that	is giving an opinion that others may not agree with
note	that	is giving his/her opinion
observe	that	is giving his/her opinion
point out	that	is giving his/her opinion
report	that	is giving research findings
show	that	is explaining, possibly with an example
state	that	is giving his/her opinion
suggest	that; + gerund	is giving his/her opinion tentatively; *or* is giving his/her recommendation

Exercise D

Discuss with the students when it is better to paraphrase and when to quote directly. Refer to the *Skills bank* if necessary.

1/2 Set for individual work and pairwork checking. Feed back with the whole class.

3 Set for individual work. Remind students that if they want to quote another source but to omit some words, they can use three dots (…) to show some words are missing. They can also use brackets where the grammar of a quotation needs to be changed.

Language note

When deciding between quoting directly and paraphrasing, students need to decide whether the writer's original words are special in any way. If they are, then a direct quote is better – for example, with a definition, or if the writer has chosen some slightly unusual words to express an idea. If the writer is giving factual information or a description, a paraphrase is better. Opinions also tend to be paraphrased.

Answers

Possible answers:

1–3 See table on opposite page.

Exercise E

1/2 Set for individual work. Feed back with the whole class.

Answers

The answers will very much depend on the students and their experiences with the different types of service.

Examples which can be identified may include:

virtual worlds – Second Life

mirror worlds – Google Earth (and Google Maps to some extent)

lifelogging – any type of blogging software (Blogger) or social networking (Facebook, MySpace), which can be described as a type of lifelogging

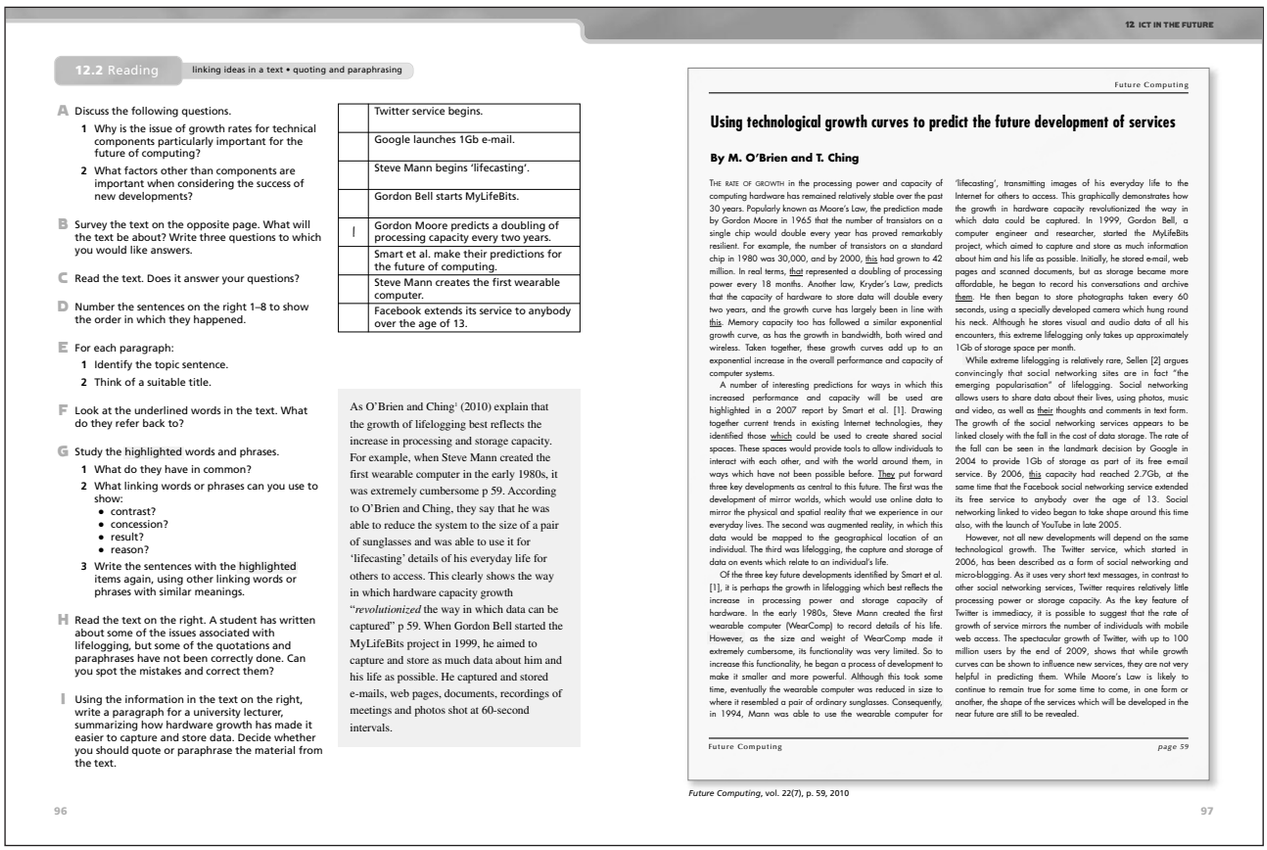
augmented reality – various applications for the iPhone or other GPS and web-enabled handsets. Examples are Sky Map or Sky Voyager, which allow users to use their handsets to identify stars and planets in the night sky.

Original sentence	The writer is …	Direct quote or paraphrase?	Suggested sentence
a Mirror worlds model the world around us, mirroring the geospatial reality that we experience in our everyday lives.	making a statement of fact	paraphrase with a direct quotation	Chen [1] states that mirror worlds can be used to replicate our everyday "geospatial reality".
b However, it appears that the successful use of mirror worlds for contingency planning is very dependent on the quality of the data used.	giving an opinion	paraphrase	Chen [1] argues, though, that mirror worlds can only be effective in contingency planning if the data mapped onto them is reliable.
c As Ding[1] (2009) states, it will be some time before it is possible to "look into a computer screen and see reality".	quoting from another author who is making a strong statement	quoting the other author directly	Chen [1] cites Ding[1], who points out that the ability to "look into a computer screen and see reality" is some way off.
d Relatively low-cost GPS and camera technology, such as that used for Google Streetview, show how it is possible to capture large quantities of high-quality visual data quickly.	explaining, with an example	paraphrase	Chen [1] points out that Google's Streetview illustrates the possibility of obtaining sizeable amounts of good quality visual information using comparatively inexpensive GPS and cameras.

Closure

Divide students into groups of four. Ask them to discuss which services people in their own countries use in each of the four categories and whether these are national services or international services such as Google Earth. Each group will need to discuss the advantages and disadvantages of using international services as opposed to developing services of their own. List the results on the board and organize a debate between the two opposing sides.

12.2 Reading



12.2 Reading linking ideas in a text • quoting and paraphrasing

A Discuss the following questions.
1 Why is the issue of growth rates for technical components particularly important for the future of computing?
2 What factors other than components are important when considering the success of new developments?

B Survey the text on the opposite page. What will the text be about? Write three questions to which you would like answers.

C Read the text. Does it answer your questions?

D Number the sentences on the right 1–8 to show the order in which they happened.

E For each paragraph:
1 Identify the topic sentence.
2 Think of a suitable title.

F Look at the underlined words in the text. What do they refer back to?

G Study the highlighted words and phrases.
1 What do they have in common?
2 What linking words or phrases can you use to show:
- contrast?
- concession?
- result?
- reason?

3 Write the sentences with the highlighted items again, using other linking words or phrases with similar meanings.

H Read the text on the right. A student has written about some of the issues associated with lifelogging, but some of the quotations and paraphrases have not been correctly done. Can you spot the mistakes and correct them?

I Using the information in the text on the right, write a paragraph for a university lecturer, summarizing how hardware growth has made it easier to capture and store data. Decide whether you should quote or paraphrase the material from the text.

	Twitter service begins.
	Google launches 1Gb e-mail.
	Steve Mann begins 'lifecasting'.
	Gordon Bell starts MyLifeBits.
I	Gordon Moore predicts a doubling of processing capacity every two years.
	Smart et al. make their predictions for the future of computing.
	Steve Mann creates the first wearable computer.
	Facebook extends its service to anybody over the age of 13.

As O'Brien and Ching[1] (2010) explain that the growth of lifelogging best reflects the increase in processing and storage capacity. For example, when Steve Mann created the first wearable computer in the early 1980s, it was extremely cumbersome p 59. According to O'Brien and Ching, they say that he was able to reduce the system to the size of a pair of sunglasses and was able to use it for 'lifecasting' details of his everyday life for others to access. This clearly shows the way in which hardware capacity growth "*revolutionized* the way in which data can be captured" p 59. When Gordon Bell started the MyLifeBits project in 1999, he aimed to capture and store as much data about him and his life as possible. He captured and stored e-mails, web pages, documents, recordings of meetings and photos shot at 60-second intervals.

Using technological growth curves to predict the future development of services

By M. O'Brien and T. Ching

THE RATE OF GROWTH in the processing power and capacity of computing hardware has remained relatively stable over the past 30 years. Popularly known as Moore's Law, the prediction made by Gordon Moore in 1965 that the number of transistors on a single chip would double every year has proved remarkably resilient. For example, the number of transistors on a standard chip in 1980 was 30,000, and by 2000, this had grown to 42 million. In real terms, that represented a doubling of processing power every 18 months. Another law, Kryder's Law, predicts that the capacity of hardware to store data will double every two years, and the growth curve has largely been in line with this. Memory capacity too has followed a similar exponential growth curve, as has the growth in bandwidth, both wired and wireless. Taken together, these growth curves add up to an exponential increase in the overall performance and capacity of computer systems.

A number of interesting predictions for ways in which this increased performance and capacity will be used are highlighted in a 2007 report by Smart et al. [1]. Drawing together current trends in existing Internet technologies, they identified those which could be used to create shared social spaces. These spaces would provide tools to allow individuals to interact with each other, and with the world around them, in ways which have not been possible before. They put forward three key developments as central to this future. The first was the development of mirror worlds, which would use online data to mirror the physical and spatial reality that we experience in our everyday lives. The second was augmented reality, in which this data would be mapped to the geographical location of an individual. The third was lifelogging, the capture and storage of data on events which relate to an individual's life.

Of the three key future developments identified by Smart et al. [1], it is perhaps the growth in lifelogging which best reflects the increase in processing power and storage capacity of hardware. In the early 1980s, Steve Mann created the first wearable computer (WearComp) to record details of his life. However, as the size and weight of WearComp made it extremely cumbersome, its functionality was very limited. So to increase this functionality, he began a process of development to make it smaller and more powerful. Although this took some time, eventually the wearable computer was reduced in size to where it resembled a pair of ordinary sunglasses. Consequently, in 1994, Mann was able to use the wearable computer for 'lifecasting', transmitting images of his everyday life to the Internet for others to access. This graphically demonstrates how the growth in hardware capacity revolutionized the way in which data could be captured. In 1999, Gordon Bell, a computer engineer and researcher, started the MyLifeBits project, which aimed to capture and store as much information about him and his life as possible. Initially, he stored e-mail, web pages and scanned documents, but as storage became more affordable, he began to record his conversations and archive them. He then began to store photographs taken every 60 seconds, using a specially developed camera which hung round his neck. Although he stores visual and audio data of all his encounters, this extreme lifelogging only takes up approximately 1Gb of storage space per month.

While extreme lifelogging is relatively rare, Sellen [2] argues convincingly that social networking sites are in fact "the emerging popularisation" of lifelogging. Social networking allows users to share data about their lives, using photos, music and video, as well as their thoughts and comments in text form. The growth of the social networking services appears to be linked closely with the fall in the cost of data storage. The rate of the fall can be seen in the landmark decision by Google in 2004 to provide 1Gb of storage as part of its free e-mail service. By 2006, this capacity had reached 2.7Gb, at the same time that the Facebook social networking service extended its free service to anybody over the age of 13. Social networking linked to video began to take shape around this time also, with the launch of YouTube in late 2005.

However, not all new developments will depend on the same technological growth. The Twitter service, which started in 2006, has been described as a form of social networking and micro-blogging. As it uses very short text messages, in contrast to other social networking services, Twitter requires relatively little processing power or storage capacity. As the key feature of Twitter is immediacy, it is possible to suggest that the rate of growth of service mirrors the number of individuals with mobile web access. The spectacular growth of Twitter, with up to 100 million users by the end of 2009, shows that while growth curves can be shown to influence new services, they are not very helpful in predicting them. While Moore's Law is likely to continue to remain true for some time to come, in one form or another, the shape of the services which will be developed in the near future are still to be revealed.

Future Computing, vol. 22(7), p. 59, 2010

General note

Read the *Vocabulary bank* and *Skills bank* at the end of the Course Book unit. Decide when, if at all, to refer students to them. The best time is probably at the very end of the lesson or the beginning of the next lesson, as a summary/revision.

Lesson aims

- understand rhetorical markers in writing (*but* and *so* categories)
- use direct quotations from other writers:
  common mistakes
  missing words
  fitting to the grammar of the sentence
  adding emphasis to a quote
  continuing to quote from the same source

Further practice in:

- indirect quotations/paraphrases/summaries
- summarizing with a series of topic sentences
- rhetorical markers (adding points)
- deictic reference and relative pronouns

Introduction

To prepare students for the lesson's theme, ask them what they can remember about the growth in the speed of computers from Unit 5 and the different aspects of computer systems development in Units 7, 8 and 9.

Exercise A

Set for pairwork or class discussion. Accept any reasonable suggestions. There is no need to explore the issues in depth, as many of these will be covered in the reading.

Answers

Possible answers:

1 Because the speed and capacity of a system is dependent on technical development, as are the size, portability and cost of the item. For example, Google's search engine relies heavily on the availability of cheap storage, which allows it to make copies of websites. The iPod is dependent on the available of small, reliable components which can store large quantities of data.

2 There are many possible answers to this question. Examples are the software which uses the technology, and how efficient or innovative it is, and the design of the product or service. For example, the iPod used new technology, but it did so in a way which was incredibly innovative in terms of design. The extent to which a product or service fits in with the relevant culture is also important.

Exercise B

Remind students about surveying a text (skim-reading to get an approximate idea of the text contents by looking at the title, looking at the beginning few lines and the final few lines of the text, and by looking at the first sentence of each paragraph).

Set for individual work and pairwork discussion. Each pair should agree three questions. Feed back with the whole class. Write some questions on the board.

Note that the text is a fictitious article by a fictitious author although references within the article are genuine.

Exercise C

Set for individual work followed by pairwork discussion. Feed back with the whole class. Ask whether the questions you have put on the board have been answered in the text.

Exercise D

Set for individual work and pairwork checking. This activity could also be done using Resource 12C in the additional resources section. Photocopy and cut up the sentences and hand them out in a jumbled order. Tell students to put them in the correct order.

Answers

Model answers:

7	Twitter service begins.
5	Google launches 1Gb e-mail.
3	Steve Mann begins 'lifecasting'.
4	Gordon Bell starts MyLifeBits.
1	Gordon Moore predicts a doubling of processing capacity every two years.
8	Smart et al. make their predictions for the future of computing.
2	Steve Mann creates the first wearable computer.
6	Facebook extends its service to anybody over the age of 13.

Exercise E

1/2 Set for individual work and pairwork discussion. The topic sentences should suggest a suitable title.

Answers

Possible answers:

	Topic sentence	Para title
Para 1	The rate of growth in the processing power and capacity of computing hardware has remained relatively stable over the past 30 years.	Growth rates for processing and storage capacity
Para 2	A number of interesting predictions for ways in which this increased performance and capacity will be used are highlighted in a 2007 report by Smart et al [1].	Predictions for the use of increased power and capacity
Para 3	Of the three key future developments identified by Smart et al. [1], it is perhaps the growth in lifelogging which best reflects the increase in in processing power and storage capacity of hardware.	Growth of lifelogging mirrors the increase in processing power and storage capacity
Para 4	While extreme lifelogging is relatively rare, Sellen [2] argues convincingly that social networking sites are in fact "the emerging popularisation" of lifelogging.	Social networking as lifelogging
Para 5	However, not all new developments will depend on the same technological growth.	Factors in addition to technological growth

Exercise F

Set for individual work and pairwork checking.

Answers

Model answers:

Word	Refers to
this	the number of transistors on a standard chip
that	the increase in the number of transistors on a chip between 1980 and 2000, i.e., 42 million
this	Kryder's Law
which	current trends in existing Internet technologies
they	Smart et al.
them	his conversations
their	users
this	Google's e-mail capacity

Exercise G

1 Refer students to the highlighted words. Elicit that they are all linking words and phrases.

2 With the whole class, elicit from the students some linking words that can be used for:

- contrast and concession (i.e., words which have a *but* meaning)
- result and reason (i.e., words which have a *so* or *for* meaning)

Build the table in the Answers section on the board, reminding students of the difference between between- and within-sentence linking words (refer to Unit 11 *Vocabulary bank*).

3 Set for individual work. Encourage students to rewrite the sentences using a different type of linking word from the original (i.e., swapping between- and within-sentence linking words).

Answers

Possible answers:

2

	Between-sentence linking words/phrases	**Within-sentence linking words/phrases**
Contrast (but) used when comparing	However, … In/By contrast, … On the other hand, …	… but … … whereas … … while …
Concession (but) used to concede/accept a point which simultaneously contrasts with the main point of a sentence or paragraph	However, … At the same time, … Nevertheless, … Despite/In spite of (*this*/noun), … Yet, …	… although … … despite/in spite of the fact that ... … even though
Result (so)	So, … As a result, … Consequently, … Therefore, …	…, so … … so that … … with the result that …
Reason (for)	Because of (*this*/noun), … Owing to (*this*/noun), … Due to (*this*/noun), …	… because … … since … … as … … due to/owing to the fact that …

3 *Yet*, as the size and weight of WearComp made it extremely cumbersome, its functionality was very limited.

As a result/Consequently/Therefore, to increase its functionality he began a process of development to make it smaller and more powerful.

While this took some time, eventually the wearable computer was reduced in size to where it resembled a pair of ordinary sunglasses.

This took some time, *but* eventually the wearable computer …

As a result/Because of this/Owing to this/Due to this, in 1994, Mann was able to use the wearable computer for 'lifecasting', transmitting images of his everyday life to the Internet for others to access.

This extreme lifelogging only takes up to approximately 1GB of storage space per month, *even though* he stores visual and audio data of all his encounters.

Although extreme lifelogging is relatively rare, Sellen [2] argues convincingly that social networking sites are in fact "the emerging popularisation" of lifelogging.

OR

Extreme lifelogging is relatively rare. *However*, Sellen [2] argues …

Because it uses very short text messages, in contrast to other social networking services, Twitter requires relatively little processing power or storage capacity.

Exercise H

Set for individual work and pairwork checking.
Feed back with the whole class.

Answers

Model answers:

Corrected version	Comments
As O'Brien and Ching [1] explain, ...	1. Note the grammar here: either *As O'Brien and Ching explain* or *O'Brien and Ching explain that*, but not both. This is a common mistake. 2. Note how a number in square brackets is used to identify a reference in the bibliography (when using the IEEE referencing system).
An example of this was shown in the early 1980s when Steve Mann developed the first wearable computer, which the article described as "extremely cumbersome" [1].	1. Note that the words which have been taken from the article have quotation marks. 2. There is no need to give the page number at the end of the quote. Instead, a numbered reference should be used.
According to O'Brien and Ching [1],	You do not need to use the verb 'say' with *According to*.
... he reduced the system	Use of the passive is better than the active in this context.
This clearly shows the way in which the growth in hardware capacity "*revolutionized* the way in which data could be captured" [emphasis added].	1. The first part of the sentence has been paraphrased, which is appropriate in this case. 2. If you want to emphasize a part of a quote, use italics and then put [emphasis added] after the quote.
The MyLifeBits project, started by Gordon Bell in 1999, aimed to capture and store as much data about him as possible. This data included e-mail, web pages, documents, recordings of meetings and photos shot at 60-second intervals.	The sentence has been rewritten to make more use of the passive.

Exercise I

Set for individual work, possibly for homework. Alternatively, set for pair or small group work. Students can write the paragraph on an OHT or other visual medium, which you can display and give feedback on with the whole class.

Answers

Possible answers:

According to O'Brien and Ching [1], the increase in processing power and storage capacity of hardware has "revolutionized the way in which data could be captured". By making smaller and more powerful computers, the growth in hardware capacity makes it much easier to store and capture text, audio and video data. One example of this came in the 1980s, when Steve Mann created the first wearable computer, which was described as "extremely cumbersome" [1]. However, as components became smaller, he was able to reduce the size of the computer to a pair of sunglasses. Another example came from Gordon Bell. In 1999, he established the MyLifeBits project which set out to "capture and store as much data about him and his life as possible" [1]. He collected a wide range of text-based data, audio recordings of meetings and photos, which used around 1GB of storage per month. A few years earlier, storing this volume of data would have been extremely expensive.

Closure

Ask students to discuss these questions.

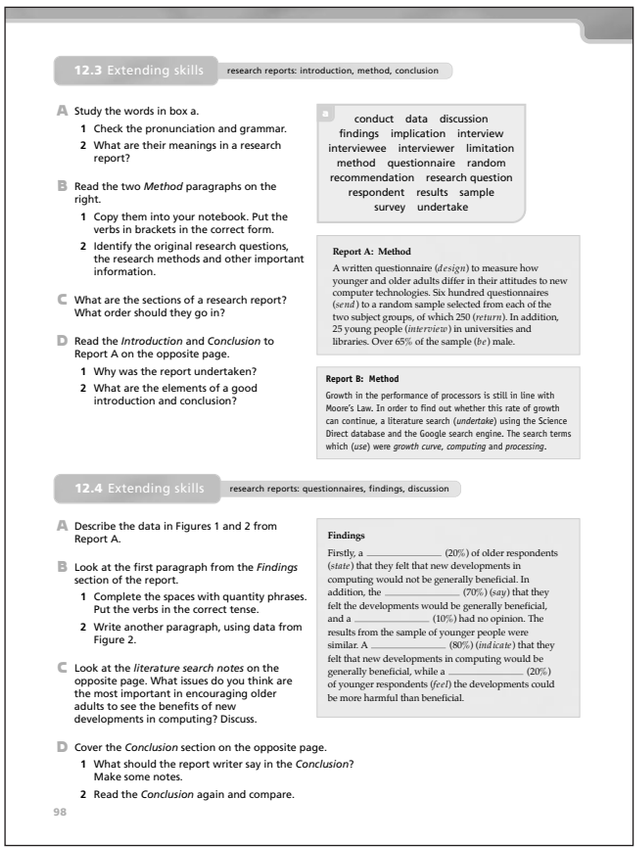
1 Are there social and cultural limits to the type and amount of data which can be stored as part of lifelogging?

2 What parts of an individual's life would it be inappropriate for others to view? If there is general agreement that some aspects of life should remain private, should there be some means of enforcing this?

3 Given that a very high proportion of the world's population do not have access to any computing power, it is likely that lifelogging will remain the preserve of a relatively small number of people. To what extent do you agree that the cost of making it possible for every individual on earth to store their life data would be far too high?

Accept any reasonable suggestions.

12.3 Extending skills



12.3 Extending skills — research reports: introduction, method, conclusion

A Study the words in box a.
1 Check the pronunciation and grammar.
2 What are their meanings in a research report?

B Read the two *Method* paragraphs on the right.
1 Copy them into your notebook. Put the verbs in brackets in the correct form.
2 Identify the original research questions, the research methods and other important information.

C What are the sections of a research report? What order should they go in?

D Read the *Introduction* and *Conclusion* to Report A on the opposite page.
1 Why was the report undertaken?
2 What are the elements of a good introduction and conclusion?

a
conduct data discussion findings implication interview interviewee interviewer limitation method questionnaire random recommendation research question respondent results sample survey undertake

Report A: Method
A written questionnaire (*design*) to measure how younger and older adults differ in their attitudes to new computer technologies. Six hundred questionnaires (*send*) to a random sample selected from each of the two subject groups, of which 250 (*return*). In addition, 25 young people (*interview*) in universities and libraries. Over 65% of the sample (*be*) male.

Report B: Method
Growth in the performance of processors is still in line with Moore's Law. In order to find out whether this rate of growth can continue, a literature search (*undertake*) using the Science Direct database and the Google search engine. The search terms which (*use*) were *growth curve, computing* and *processing*.

12.4 Extending skills — research reports: questionnaires, findings, discussion

A Describe the data in Figures 1 and 2 from Report A.

B Look at the first paragraph from the *Findings* section of the report.
1 Complete the spaces with quantity phrases. Put the verbs in the correct tense.
2 Write another paragraph, using data from Figure 2.

C Look at the *literature search notes* on the opposite page. What issues do you think are the most important in encouraging older adults to see the benefits of new developments in computing? Discuss.

D Cover the *Conclusion* section on the opposite page.
1 What should the report writer say in the *Conclusion*? Make some notes.
2 Read the *Conclusion* again and compare.

Findings
Firstly, a _____ (20%) of older respondents (*state*) that they felt that new developments in computing would not be generally beneficial. In addition, the _____ (70%) (*say*) that they felt the developments would be generally beneficial, and a _____ (10%) had no opinion. The results from the sample of younger people were similar. A _____ (80%) (*indicate*) that they felt that new developments in computing would be generally beneficial, while a _____ (20%) of younger respondents (*feel*) the developments could be more harmful than beneficial.

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Lesson aims

- structure a research report:
  Introduction
  Method
  Conclusion

Further practice in:

- essay structure
- research methods

Introduction

In preparation for looking at the structure of a research report, revise the sections for an essay: introduction, body, conclusion.

Ask students what should go in each section. Elicit ideas for introductions and conclusions. Do not correct at this point.

Remind students about the methods for doing research (see Unit 5). Ask students what kinds of research would be appropriate if you want to gather information on users' views for a specific development project. (Primary sources are best: survey, questionnaire, interview, quantitative and qualitative methods.)

Ask students what kinds of research would be appropriate if you want to find out what the issues relating to a specific topic are. (Secondary sources are the easiest, e.g., database searching using Science Direct, Google, professional reports, reference books, etc.)

Tell students that the next two lessons will focus on writing up research in reports. Ask for suggestions for suitable sections of a research report. Do not correct at this point.

Subject note

In the models presented here, the report is executed at a very simple level. For instance, in a real academic research report, there will be a literature review section before the methods section, and the research questions will be linked with this review. There are also different models for reports. For example, a report on an operational matter (as opposed to an academic research report) may put conclusions and recommendations near the beginning and the findings as the final section. Sometimes this is done in the form of an Executive Summary. For the complete text of the report, see Resource 12D in the additional resources section.

Exercise A

Set for individual work and pairwork checking. Feed back with the whole class.

Answers

Model answers:

Word	Notes on pronunciation and grammar	Meaning in a research report
con'duct	v (noun is pronounced: 'conduct)	do (some research, a survey, an experiment)
'data	pl n	information; can be numerical (quantitative) or verbal (qualitative)
dis'cussion	n (U/C)	the title of the section in a research report which discusses the findings; sometimes the discussion is included in the *Findings/Results* section
'findings	pl n	the title of the section in a research report which details what has been found out: each finding should be linked with a research question; the title *Results* can also be used for this section
impli'cation	n (C)	possible effect or result of the findings
'interview	n (C), v	noun: when someone is asked questions in a survey verb: to ask someone questions in a survey
interview'ee	n (C)	the person being questioned
'interviewer	n (C)	the person asking the questions
limi'tation	n (C)	a problem with the research methods: an aspect which the research could not address
'method	n (C)	title of the section in a research report which explains how the research was carried out; in the plural form, it refers to the research methods used
question'naire	n (C)	a written set of questions
'random	adj	in no fixed order: with no organizing principle
recommen'dation	n (C)	suggestion for action as a result of the findings of the research
re'search question	n (C)	what the researcher wants to find out
re'spondent	n (C)	a person taking part in a questionnaire survey
re'sults	pl n	same as *Findings*; used more or less interchangeably
'sample	n (C), v	noun: the group of people taking part in the research verb: to ask research questions to a selected group of people
'survey	n (C), v	noun: a type of research in which the researcher sets out to describe a situation or set of ideas or behaviours, by reading a variety of documents or asking people questions verb: conduct this type of research
under'take	v	do (some research, a survey)

Exercise B

Explain to the students that these paragraphs are examples of the *Method* section of a research report.

1 Set for individual work. Ask students to copy the text into their notebooks and put the verbs into the correct form. Feed back with the whole class, drawing students' attention to the use of the past tense when reporting methods of research, as well as the use of the passive.

2 Set for individual work and pairwork checking. Tell students that they should transform the research questions into real, direct questions. Feed back with the whole group, pointing out that the information given in the *Method* section should include these types of details.

Answers

Possible answers:

See table on next page.

	Research questions	Research method	Other important information
Method (A) A written questionnaire (*design*) was designed to measure how younger and older adults differ in their attitudes to computer technologies. Six hundred questionnaires (*send*) were sent to a random sample selected from each of the two subject groups, of which 250 (*return*) were returned. In addition, 25 young people (*interview*) were interviewed in universities and libraries. Over 65% of the sample (*be*) were male.	1. What difference is there between younger and older adults in terms of their use of computers? 2. What difference is there between younger and older adults in terms of their attitudes to new developments in computing?	written questionnaire	600 questionnaires random sample from each subject group 250 returned
		interview	25 young people interviewed in universities and libraries 65% of sample = male
Method (B) Growth in the performance of processors is still in line with Moore's Law. In order to find out whether this rate of growth can continue, a literature search (*undertake*) was undertaken using the Science Direct database and the Google search engine. The search terms which (*use*) were used were *growth curve*, *computing* and *processing*.	Can the rate of growth predicted by Moore's Law continue?	literature search	search terms – *growth curve* *computing* *processing*

Exercise C

Use this to confirm that students understand the organization of a research report. Elicit the answers from the whole class.

Answers

Model answers:

Section	Order in a research report
Introduction	1
Method	2
Findings/Results	3
Discussion	4
Conclusion	5

Subject note

Different disciplines and reports for varying purposes may have different section names or organization. The model suggested here is a rather general one, and is a pattern commonly adopted in an academic context, though there are variations depending on the level of the writing (whether, for example, it is a Master's or PhD dissertation). If students are going to write about 500 words only, you may wish to include *Discussion with Findings/Results* or with the *Conclusion*.

Exercise D

Explain to the students that these are examples of a typical introduction and conclusion. The introduction explains why a report was undertaken.

Set for pairwork discussion. Feed back with the whole class. Bring the class's attention to the tenses that are used here (present perfect, present simple, future) as well as the use of the passive.

Answers

Model answers:

1 To find out the differences in the attitudes to new computer technologies between younger and older adults.

2 See table on next page.

Good introduction	Example sentences
Introduce the topic. Give some background information.	There has been much debate about the extent to which older people are excluded from the benefits of developments in computing technology.
Say why the topic is important.	In order that all age groups can benefit equally from these improvements, it is important that older people feel positive about new developments and how they can benefit from them.
Say what you will do in the report. Give a general statement of the purpose of the research.	This report will describe a survey undertaken to examine the differences in perceptions of future developments in computing between younger and older adults. Recommendations will be made on how older adults can be encouraged to feel more positive about new technological developments.
Good conclusion	**Example sentences**
Give a general summary/restatement of findings.	To conclude, it is clear that there are a number of differences between the younger and older adults in terms of their perceptions of the benefits of new developments in computing.
Say what your recommendations are.	The evidence suggests that the issues identified should be taken into account when designing new computer devices and services. Older adults should be included in the groups used to test new prototypes, so that designs can take their requirements into account. In particular, these relate to the speed with which they can familiarize themselves with the product or service and the extent to which they feel control over it. More attention should also be given to publicizing the beneficial effects of new computer developments for older people.
Set out the implications of not taking action.	Unless these recommendations are put into practice, older adults will not fully realize the benefits of new developments in computing.

Language note

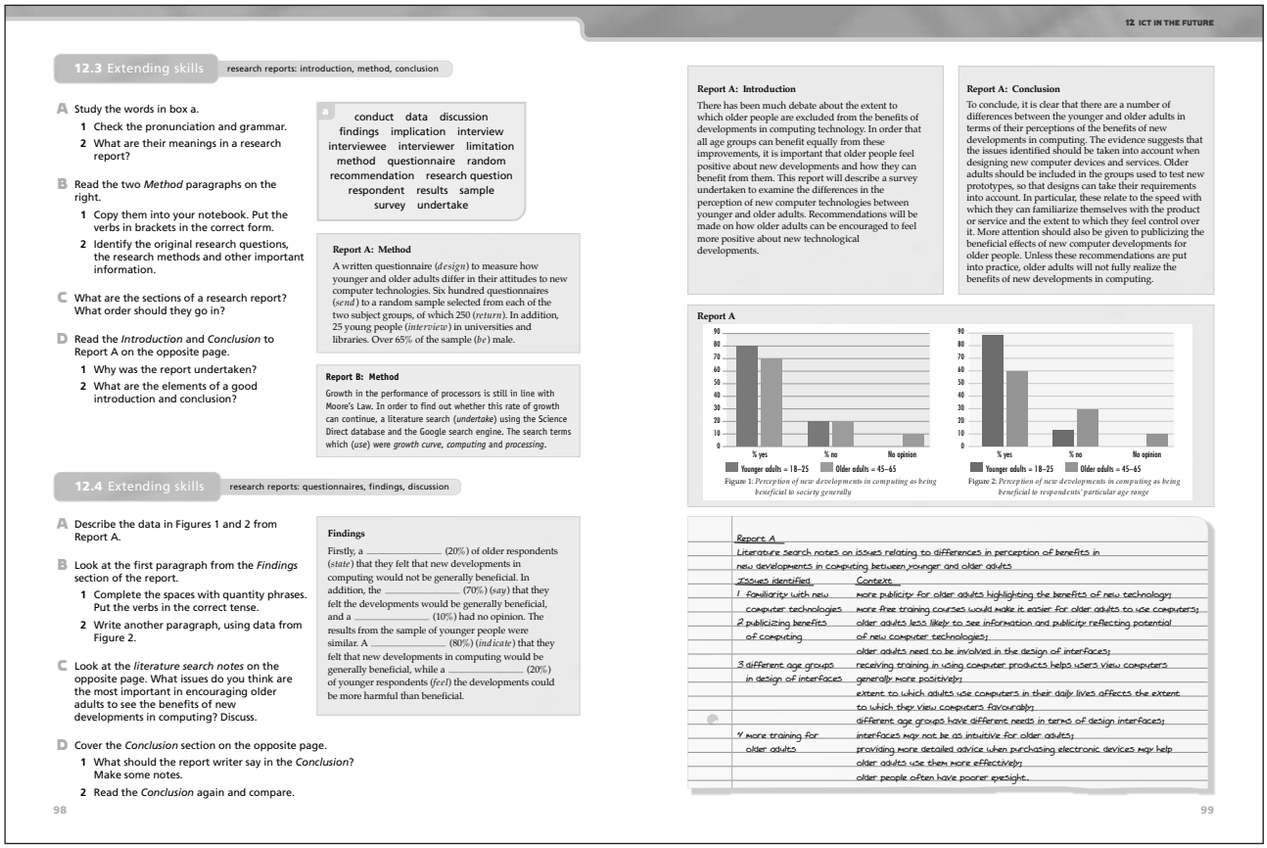
The impersonal use of the passive for research reports is not absolutely required. It is often possible to find students' work (assignments, dissertations) which contains the use of the first person singular. However, in more formal writing, such as in journal articles, the passive is usually used.

Closure

1 Refer students to the *Skills bank* to consolidate their understanding of the sections of a research report and their contents.

2 Ask students to choose a topic related to the future development of a specific hardware device, service or game, about which they would like to carry out some customer research. At least some elements of the future development should be clearly identifiable as new. They should think about aspects such as the possible benefits and drawbacks that the development could deliver, the extent to which it is similar to – or different from – existing developments, the costs to the potential user(s), and environmental aspects. What questions would they ask customers in a questionnaire?

12.4 Extending skills



12 ICT IN THE FUTURE

12.3 Extending skills research reports: introduction, method, conclusion

A Study the words in box a.
1 Check the pronunciation and grammar.
2 What are their meanings in a research report?

a
conduct data discussion findings implication interview interviewee interviewer limitation method questionnaire random recommendation research question respondent results sample survey undertake

B Read the two *Method* paragraphs on the right.
1 Copy them into your notebook. Put the verbs in brackets in the correct form.
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C What are the sections of a research report? What order should they go in?

D Read the *Introduction* and *Conclusion* to Report A on the opposite page.
1 Why was the report undertaken?
2 What are the elements of a good introduction and conclusion?

Report A: Method
A written questionnaire (*design*) to measure how younger and older adults differ in their attitudes to new computer technologies. Six hundred questionnaires (*send*) to a random sample selected from each of the two subject groups, of which 250 (*return*). In addition, 25 young people (*interview*) in universities and libraries. Over 65% of the sample (*be*) male.

Report B: Method
Growth in the performance of processors is still in line with Moore's Law. In order to find out whether this rate of growth can continue, a literature search (*undertake*) using the Science Direct database and the Google search engine. The search terms which (*use*) were *growth curve, computing* and *processing*.

12.4 Extending skills research reports: questionnaires, findings, discussion

A Describe the data in Figures 1 and 2 from Report A.

B Look at the first paragraph from the *Findings* section of the report.
1 Complete the spaces with quantity phrases. Put the verbs in the correct tense.
2 Write another paragraph, using data from Figure 2.

C Look at the *literature search notes* on the opposite page. What issues do you think are the most important in encouraging older adults to see the benefits of new developments in computing? Discuss.

D Cover the *Conclusion* section on the opposite page.
1 What should the report writer say in the *Conclusion*? Make some notes.
2 Read the *Conclusion* again and compare.

Findings
Firstly, a _____ (20%) of older respondents (*state*) that they felt that new developments in computing would not be generally beneficial. In addition, the _____ (70%) (*say*) that they felt the developments would be generally beneficial, and a _____ (10%) had no opinion. The results from the sample of younger people were similar. A _____ (80%) (*indicate*) that they felt that new developments in computing would be generally beneficial, while a _____ (20%) of younger respondents (*feel*) the developments could be more harmful than beneficial.

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Report A: Introduction
There has been much debate about the extent to which older people are excluded from the benefits of developments in computing technology. In order that all age groups can benefit equally from these improvements, it is important that older people feel positive about new developments and how they can benefit from them. This report will describe a survey undertaken to examine the differences in the perception of new computer technologies between younger and older adults. Recommendations will be made on how older adults can be encouraged to feel more positive about new technological developments.

Report A: Conclusion
To conclude, it is clear that there are a number of differences between the younger and older adults in terms of their perceptions of the benefits of new developments in computing. The evidence suggests that the issues identified should be taken into account when designing new computer devices and services. Older adults should be included in the groups used to test new prototypes, so that designs can take their requirements into account. In particular, these relate to the speed with which they can familiarize themselves with the product or service and the extent to which they feel control over it. More attention should also be given to publicizing the beneficial effects of new computer developments for older people. Unless these recommendations are put into practice, older adults will not fully realize the benefits of new developments in computing.

Report A

Figure 1: *Perception of new developments in computing as being beneficial to society generally*

Figure 2: *Perception of new developments in computing as being beneficial to respondents' particular age range*

Report A
Literature search notes on issues relating to differences in perception of benefits in new developments in computing between younger and older adults

Issues identified	Context
1 Familiarity with new computer technologies	more publicity for older adults highlighting the benefits of new technology; more free training courses would make it easier for older adults to use computers;
2 publicizing benefits of computing	older adults less likely to see information and publicity reflecting potential of new computer technologies;
	older adults need to be involved in the design of interfaces;
3 different age groups in design of interfaces	receiving training in using computer products helps users view computers generally more positively;
	extent to which adults use computers in their daily lives affects the extent to which they view computers favourably;
	different age groups have different needs in terms of design interfaces;
4 more training for older adults	interfaces may not be as intuitive for older adults;
	providing more detailed advice when purchasing electronic devices may help older adults use them more effectively;
	older people often have poorer eyesight.

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Lesson aims

- write part of a research report: *Findings* and *Discussion*
- analyze and use research data and information

Further practice in:

- talking about numbers and quantities

Introduction

Write up the table below on the board. Give some example phrases and ask students to say approximately what percentage they represent, e.g., a large majority = 80% approximately?

A/An	overwhelming large significant slight small insignificant tiny	majority	(of + noun)
		minority	
		number	
Over		half a quarter a third	
More	than		
Less		x%	

Note that *of* is needed if the category for the numbers is given: *A slight minority of respondents said that …* but *A slight minority said that …*

Ask students: what is the difference between *many* and *most*?

Exercise A

Set students to work in pairs to talk about the key elements of the numbers shown in the charts. If you wish, ask students to write some sentences. Feed back with the whole class, writing some example sentences on the board. Ask the class what these results seem to show about the attitude of older and younger adults towards new computing developments. Clarify that *older adults* refer to those aged 45–65 and *younger adults* are aged between 18 and 25.

Answers

Possible answers:

Figure 1

An overwhelming majority of younger adult respondents (80%) felt that new developments in computing would be beneficial to society, compared with 70% of older adult respondents. A significant minority (20%) of both age groups felt that new

developments would be beneficial. A very small minority (10%) of older respondents had no opinion.

Figure 2

An overwhelming majority (88%) of younger adult respondents said they agreed with the statement that new developments in computing would benefit people of their age.

A significant majority (60%) of older adult respondents agreed with them. A significant minority of older adult respondents (30%) disagreed with the statement, along with 12% of younger respondents. A small minority (10%) of older adult respondents had no opinion.

Exercise B

1 Set for individual work and pairwork checking. Tell students that each space may be for more than one word. They will also need to practise the expressions they used for quantity in Exercise A.

Feed back with the whole class, pointing out the use of past tenses when reporting findings.

2 Set for individual work. Remind students to use linking words and to begin with a topic sentence. This paragraph continues the Findings section of the report.

Answers

Possible answers:

1 Report A: Findings

Firstly, a minority (20%) of older respondents (*state*) stated that they felt that new developments in computing would not be generally beneficial. In addition, the majority (70%) (*say*) said that they felt the developments would be generally beneficial, and a small proportion (10%) had no opinion. The results from the sample of younger people were similar. A significant majority (80%) (*indicate*) indicated that they felt that new developments in computing would be generally beneficial, while a minority (20%) of younger respondents (*feel*) felt the developments could be more harmful than beneficial.

2 The survey also showed that there were significant differences in relation to respondents' perceptions of benefits for their age group. Firstly, an overwhelming majority of younger adults (88%) felt that new developments in computing would benefit people of their age. This compared with (60%) of older adult respondents. Secondly, a significant minority (30%) of older adults did not believe that the new developments would benefit them. Only 12% of younger adults felt the same.

Exercise C

Tell students to look at the notes on the right-hand page. These are the results of a student's research about the issues relating to differences in perception of benefits in new developments in computing between younger and older adults. Set for pairwork and tell students to rank the issues discussed in order of importance.

Answers

Possible answers: see table below.

Literature search notes on issues relating to differences in perception of benefits in new developments in computing between younger and older adults

Issues identified	Importance
1 Familiarity with new computer technologies.	Extent to which adults use computers in their daily lives affects the extent to which they view computers favourably. Receiving training in using computer products helps users view computers generally more positively.
2 Publicizing benefits of computing.	Older adults less likely to see information and publicity reflecting potential of new computer technologies. More publicity for older adults highlighting the benefits of new computer technologies.
3 Different age groups in design of interfaces.	Different age groups have different needs in terms of design interfaces. Older people often have poorer eyesight. Older adults need to be involved in the design of interfaces.
4 More training for older adults.	Interfaces may not be as intuitive for older adults. Providing more detailed advice when purchasing electronic devices may help older adults use them more effectively. More free training courses would make it easier for older adults to use computers.

Exercise D

1 Get students to cover the *Conclusion*. They may well remember what it said, but, even if they don't, they can work out what it *should* say based on the *Findings* and the *Discussion* and, of course, on the *Introduction*. Set for individual work and pairwork checking. Do not confirm or correct.

2 Refer students to the *Conclusion* to check their ideas.

Closure

1 Ask students to think of additional questions which could have been used for the questionnaire in the Course Book on differences between younger and older adults in their attitudes to new computer developments.

First, suggest some question types for questionnaires. Elicit the following:

- yes/no
- multiple choice
- open-ended

Tell students to concentrate on the *yes/no* or *multiple choice* types (open-ended questions will elicit qualitative information which is often hard to analyze) and to look at the data in Figures 1 and 2 and the sample *Findings* paragraph. They should try to formulate the actual questions given in the patient survey questionnaire.

Set for pairwork. Feed back with the whole class, writing examples of good questions up on the board. Refer to the model questionnaire in the additional resources section (Resource 12E).

2 Set a research report based on a questionnaire survey for homework. Students can use the ideas they have already discussed in this unit. They should carry out a literature review to ensure that they have covered all the main issues. They should then write questionnaires to address these issues and write up a report outlining any difficulties they found in doing so.

Extra activities

1 Work through the *Vocabulary bank* and *Skills bank* if you have not already done so, or as revision of previous study.

2 Use the *Activity bank* (Teacher's Book additional resources section, Resource 12A).

A Set the wordsearch for individual work (including homework) or pairwork.

Answers

B Set for individual work and pairwork checking.

Answers

95%	the great majority
70%	a significant majority
53%	just over half
50%	half
48%	slightly less than half
10%	a small proportion
2%	a tiny minority

3 Set Resource 12F for individual work and pairwork checking.

Answers

For Linden Lab, owning the virtual world Second Life has proved to be financially rewarding. In addition, it has led to the growth of a large virtual economy. In 2009, players in Second Life were spending the equivalent of 50 million US dollars per month on purchasing virtual land, objects and services from each other. However, there have been a number of events which highlighted the difficulty of running a virtual economy which is linked to the real one.

First, in 2006 the company faced a lawsuit for damages from a Pennsylvania lawyer who alleged that Second Life had shut down his account and cut off his access to a substantial amount of land and cash in the virtual world. This led to the hope that the legal argument would clarify some of the issues around virtual property, but the case was settled out of court. Next, in 2007 a virtual investment bank called Ginko Financial was unable to pay its depositors virtual currency to the value of around 750,000 US dollars. In the end, it declared itself insolvent. This led to calls for better regulation for banking in virtual worlds and, as a result, Linden Lab imposed a ban on banks in Second Life. Consequently, in 2010 a group of users who had purchased land in Second Life went to court to protect their ownership rights. They argued that Linden Lab initially promoted Second Life as a place where users would have indefinite ownership of their land. As a result, they felt that the Terms of Service should reflect ownership rather than the provision of a service. This resulted in the company changing its Terms of Service once again in order to make it clear that what was offered was simply a service. Also, they made it clear that the service could be withdrawn at any time. However, the issue of the status of virtual property in law has still to be fully resolved.