

JAF03 Unit 2 Innovation and Invention

Task 1 Speaking

Work in pairs and decide which of these recent innovations has had the greatest impact. Can you think of other important recent innovations?

the solar cell anaesthetics the credit card the Internet the mobile phone

Task 2 Reading

Before you read: As a part of a Business Studies course, you attended a lecture with the title *Innovation and Invention*. You found it hard to follow, but you noted down as much as you could. Work in pairs and discuss how these phrases used by the lecturer might be connected to the topic of innovation and invention.

- Market knowledge
- Breakthrough
- Commercialisation
- Facilities

You noted down questions to research later. After the lecture, you find a recommended textbook for more information. Read the extract below and make notes to answer your questions.

Innovation and invention

- different but connected - What's the difference? What's the relationship between them?
- often a delay between the two - Why is there a delay?
- a process, not an event - What does this mean?

What is an innovation?

An important distinction is normally made between invention and innovation. Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out in practice. Sometimes, invention and innovation are closely linked, to the extent that it is hard to distinguish one from another (biotechnology for instance). In many cases, however, there is a considerable time lag between the two. In fact, a lag of several decades or more is not uncommon. Such lags reflect the different requirements for working out ideas and implementing them. While inventions may be carried out anywhere, for example in universities, innovations occur mostly in firms, though they may also occur in other types of organisations, such as public hospitals. To be able to turn an invention into an innovation, a firm normally needs to combine several types of knowledge, capabilities, skills and resources. For instance, the firm may require production knowledge, skills and facilities, market knowledge, a well-functioning distribution system, sufficient financial resources, and so on. It follows that the role of the innovator, i.e. the person or organisational unit responsible for combining the factors necessary (what the innovation theorist Joseph Schumpeter called the 'entrepreneur') may be quite different from that of the inventor. Indeed, history is replete with cases in which the inventor of major technological advances fails to reap the profits from his/her breakthrough.

Long lags between invention and innovation may have to do with the fact that, in many cases, some or all of the conditions for commercialisation may be lacking. There may not be a sufficient need (yet!)

or it may be impossible to produce and /or market because some vital inputs or complementary factors are not (yet!) available. Thus, although Leonardo da Vinci is reported to have had some quite advanced ideas for a flying machine, these were impossible to carry out in practice due to a lack of adequate material, production skills, and – above all – a power source. In fact, the realisation of these ideas had to wait for the invention and subsequent commercialisation (and improvement) of the internal combustion engine. Hence, as this example shows, many inventions require complementary inventions and innovations to succeed at the innovation stage.

Another complicating factor is that invention and innovation is a continuous process. For instance, the car as we know it today is radically improved compared to the first commercial models, due to the incorporation of a very large number of different inventions/ innovations. In fact, the first versions of virtually all significant innovations, from the steam engine to the airplane, were crude, unreliable versions of the devices that eventually diffused widely.

Thus, what we think of as a single innovation is often the result of a lengthy process involving many interrelated innovations.

After you read:

Find examples in the text in the same word family as words 1-5 below.

1. Occur _____
2. Distinction _____
3. Require _____
4. Innovation _____
5. Rely _____

Use your own knowledge or a dictionary to add other words to the list.

Task 3 Vocabulary in context: hedging

In academic communication, we frequently avoid making statement that are too direct or too confident. We can avoid directness by using hedges (i.e. language indicating that sth. may be true, or is true in some cases, etc.).

a) Work alone. Read sentences 1-8 and decide which need to be hedged.

b) Think about how to add a hedge from the box to the appropriate sentences.

in many cases many most mostly normally often sometimes virtually

1. While inventions may be carried out anywhere, innovations occur in firms.
2. Invention is the first occurrence of an idea for a new product or process.
3. Inventions require complementary inventions and innovations to succeed at the innovation stage.
4. The first versions of all significant innovations were crude, unreliable versions of the devices that eventually diffused widely.
5. Leonard da Vinci's ideas for a flying machine were impossible to carry out in practice.
6. What we think of as a single innovation is the result of a lengthy process.
7. Innovation is a continuous process.
8. Important innovations go through drastic changes in their lifetimes.

Task 4 Speaking

Work alone and think of an invention or innovation that has had an important impact in physics.

Make notes to explain what it is, why it is so important, and (if appropriate) any pros and cons.

Work in small groups. Take turns to talk about your innovation or invention.

(adapted from Firth, M.; Souton, C.; Hewings, M.; Thaine, C. *Cambridge Academic English – Advanced*. CUP 2012.)

Task 5 Listening

Listen to Adam Savage on TED. What examples does he give to illustrate his point that simple ideas lead to scientific discoveries?

http://www.ted.com/talks/lang/en/how_simple_ideas_lead_to_scientific_discoveries.html

Task 6 Grammar- Irregular plural nouns

Write the plural form of nouns 1-11 in the table. When both regular (-s or -es) and irregular plural forms are possible, write them both.

Singular	Plural
1. phenomenon	
2. datum	
3. maximum	
4. hypothesis	
5. criterion	
6. syllabus	
7. basis	
8. analysis	
9. formula	
10. minimum	
11. medium	

Task 7 Noun + passive verb combinations

Parts of the methods section of scientific papers describe things that 'I /we ' - that is, the researcher(s) – did. In order to avoid repeating 'I' or 'we' as the subject of the sentence, passive voice is often used instead. A number of noun + passive verb combinations are common.

What verb commonly follows all three nouns in each list?

1. Statistics/lists/ reports were comled
2. Tests/interviews/ surveys were conted
3. Data/ samples/specimens were col.....ted
4. Questionnaires/copies/test papers were disted
5. Participants/sites/subjects were selted
6. Responses/measurements/observations were rec.....ded
7. Techniques/guidelines/methods were dev.....ped
8. Investigations/analyses/experiments were per..... ed

(Task 6 and 7 adapted from Firth, M.; Souton, C.; Hewings, M.; Thaine, C. *Cambridge Academic English Advanced*. CUP 2012.)