UNIT 2: STUDYING COMPUTER SCIENCE

1. REVIEWING GRAMMAR POINTS
2. RELATIVE SENTENCES
3. CREATING NEW WORDS I: derivation, inflection, conversion, compounds, affixes and others.
4. READING STRATEGIES I: understanding the aim of the writer
5. WRITING A REPORT I: completing reports

TEXTS:
1. ‘College Delivers Lectures By Video Podcast’
2. ‘Tech Jobs Rise As Applications Fall’
3. ‘The Pressure Will Blow’
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Further reading: ‘Wireless laptops in the classroom (and the Sesame Street Syndrome)’

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1. REVIEWING GRAMMAR POINTS:

The student will have to select those explanations that the teacher offers both in theoretical and practical lessons of certain items and include them in this section.

2. RELATIVE SENTENCES:

A relative clause is a subordinate clause that begins with a question word (e.g. who, which, where) or the word that. You can use it to modify a noun or pronoun (i.e. to identify or give more information about it).

- Students **who can develop independent learning skills** often achieve good academic results.
- There is a new book **that investigates the controversy** over political reforms in Hong Kong.
- A university is a place **where people pursue advanced knowledge** in specific academic disciplines.
- The lecture theatre in **which the inauguration ceremony will be held** is now being cleaned.

**Types of relative clause**

There are two types of relative clause: defining and non-defining. You use a defining (or restrictive) relative clause to ‘identify’ or ‘restrict the reference of’ a noun. You do not separate it from the rest of the sentence by commas (in text) or pauses (in speech).

- The student who achieves the highest GPA score in this department will be awarded a prize of $20,000.
- Computer games that involve fighting and shooting apparently have a negative effect on young people.

You use a **non-defining** (or non-restrictive) relative clause to supply additional information about the noun, whose identity or reference is already established. You can also use it to comment on the whole situation described in a main clause.

- Albert Einstein, who put forward the theory of relativity, is considered by many as the most intelligent person in human history.
The ELC, which provides language support to PolyU students, is located in the AG wing.

You should not use the relative pronoun *that* in non-defining relative clauses.

3. Reduction of relative clauses
You can sometimes reduce a defining relative clause to create a more concise style. You cannot reduce a non-defining clause.

- Half of the training sessions (that are) arranged for the athletes have been cancelled due to bad weather.
- The foreigner (who/whom) you saw at the party last night is Giorgio Armani!

**EXERCISE 1:** Complete these definitions with the correct participle of the verb given in brackets.

1 *A gateway* is an interface (enable) dissimilar networks to communicate.
2 *A bridge* is a hardware and software combination (use) to connect the same type of networks.
3 *A backbone* is a network transmission path (handle) major data traffic.
4 *A router* is a special computer (direct) messages when several networks are linked.
5 *A network* is a number of computers and peripherals (link) together.
6 *A LAN* is a network (connect) computers over a small distance such as within a company.
7 *A server* is a powerful computer (store) many programs (share) by all the clients in the network.
8 *A client* is a network computer (use) for accessing a service on a server.
9 *A thin client* is a simple computer (comprise) a processor and memory, display, keyboard, mouse and hard drives only.
10 *A hub* is an electronic device (connect) all the data cabling in a network.

**EXERCISE 2:** Link these statements using a relative clause with a participle.

1 *a* The technology is here today.
   *b* It is needed to set up a home network.
2 *a* You only need one network printer.
   *b* It is connected to the server.
3 *a* Her house has a network.
   *b* It allows basic file-sharing and multi-player gaming.
4 *a* There is a line receiver in the living room.
   *b* It delivers home entertainment audio to speakers.
5 *a* Eve has designed a site.
   *b* It is dedicated to dance.
6 *a* She has built in links.
   *b* They connect her site to other dance sites.
7 *a* She created the site using a program called Netscape Composer.
   *b* It is contained in Netscape Communicator.
8 *a* At the centre of France Telecom's home of tomorrow is a network.
   *b* It is accessed through a Palm Pilot-style control pad.
9 *a* The network can simulate the owner's presence.
   *b* This makes sure vital tasks are carried out in her absence.
10 *a* The house has an electronic door-keeper.
    *b* It is programmed to recognise you.
    *c* This gives access to family only.

**EXERCISE 3:** Complete the sentences with a suitable relative pronoun.

1 That's the CPU …………. I'd like to buy.
2 A co-processor is an extra processor chip …………. does calculations at high speed.
3 The microprocessor coordinates the activities that take place in the computer system.
4 Last night I met someone who works for GM as a computer programmer.
S A palmtop is a computer that is small enough to be held in the palm of one hand.
6 A megahertz is a unit of frequency that is used to measure processor speed.
7 Here's the DVD you lent me!

EXERCISE 4: Underline the correct answer.
1 Elephants are the only animals in Africa that dig deep holes to look for water.
2 The Inuit, who used to be known as 'Eskimos', live in the coldest parts of the world.
3 According to Mexican legend, November 2nd is the day on which the dead return to life.
4 The albatross, which is a large seabird, can sleep while it flies. Coober Pedy in South Australia is one of the few places in the world where people live underground.
6 The explorer Tristao da Cunha, after whom the island in the south Atlantic was named, found it impossible to land there.

EXERCISE 5: Complete the sentences with the correct relative pronoun.
1 The Cambodian language, which has 72 letters, has the world's largest alphabet.
2 Maine is the only state in the United States whose name has only one syllable.
3 John Lennon's son, Julian, for whom Paul McCartney wrote the song 'Hey Jude', was born in 1963.
4 There are over 58,000 rocky objects in space, about 900 of which could crash into the earth.
5 Napoleon Bonaparte is the historical character whom has been portrayed the most in movies - over 190 times!

3. CREATING NEW WORDS I: derivation, inflection, conversion, compounds, affixes and others.

Derivation:
Derivation is the formation of a new word from another word or stem. It typically occurs by the addition of an affix. The derived word is often of a different word class from the original. It may thus take the inflectional affixes of the new word class.
In contrast to inflection, derivation
• is not obligatory
• typically produces a greater change of meaning from the original form, and
• is more likely to result in a form which has a somewhat idiosyncratic meaning.
• often changes the grammatical category of a root.

Inflection:
Inflection is variation in the form of a word, typically by means of an affix, that expresses a grammatical contrast which is obligatory for the stem’s word class in some given grammatical context.
In contrast to derivation, inflection
• does not result in a change of word class, and  
• usually produces a predictable, nonidiosyncratic change of meaning.

**Conversion:**
In linguistics, conversion, also called zero derivation, is a kind of word formation; specifically, it is the creation of a word from an existing word without any change in form. Conversion is more productive in some languages than in others; in English it is a fairly productive process. Often a word of one lexical category (part of speech) is converted from a word of another lexical category; for example, the noun *green* in golf (referring to a putting-green) is derived ultimately from the adjective *green*.

**Compounds:**
1. **Compound nouns**  
A compound noun is two nouns joined together.  

   - *handbag*  
   - *teacup*  
   - *weekend*  
   - *armchair*  
   - *water-power*  

   We stress the first noun, e.g. 'handbag.

   It is often difficult to tell the difference between a compound noun and two single nouns.  

**NOTE**  
A few compound nouns are formed from an adjective and noun. Compare these patterns.  

   - Compound noun: "a darkroom (= a room for developing photos)"  
   - Adjective + noun: "a dark room (= a room that is dark)"

   Other such compound nouns are *greenhouse*, *blackboard*, *shorthand*, *hotplate*.

2. **Gerund + noun**  
We can use a gerund to classify a noun, to say what type it is or what its purpose is.  

   - *the dining room (= the room for dining in)*  
   - *a sailing boat*  
   - *running shoes*  
   - *the booking-office*  
   - *some writing-paper*  
   - *a swimming-pool*  

   We often use a hyphen. We stress the gerund, e.g. 'the dining-room.

**NOTE**  
Compare a gerund and participle.  

   - Gerund: "a 'sleeping pill (= a pill for helping you to sleep)"  
   - Participle: "a sleeping 'child (= a child who is sleeping)"

3. **Noun + gerund**  
A gerund can have a noun object in front of it.  

   - *Coin-collecting is an interesting hobby.*  
   - *I'm tired of sightseeing.*  
   - *Taxi-driving was what I always wanted to do.*  

   We stress the noun. e.g. 'coin-collecting. The noun is singular:  

**NOT coin-collecting.** Compare a gerund clause.  

   - *Collecting coins is an interesting hobby.*

4. **Compounds with participles**  
We can form compounds with active or passive participles.  

   - *a road-widening scheme*  
   - *a hard-boiled egg*  

5. **Compounds with numbers**  
We can use a number + noun to modify another noun.  

   - *a three-day visit*  
   - *a six-mile journey*  
   - *a car with four-wheel drive*  

   The noun is singular: **NOT a three-days visit.** We can also say *a visit of three days.*
We can also use a number + noun + adjective.

   a three-day-old baby a hundred-yard-long queue

Prefixes
A prefix comes at the beginning of a word. It adds something to the meaning.

1 Here are some common prefixes.
re (= again): rewrite a letter, re-enter a room, remarry
semi (= half): semi-skilled workers, a semi-conscious state
mono (= one): monorail, monolingual, a monotone
multi (= many): a multinational company, a multi-storey car park
super (= big/more): a superstore, a superhuman effort, a supersonic aircraft
sub (= underlless): subnormal intelligence, sub-zero temperatures
mini (= small): a minibus, a miniskirt, a minicomputer
pre (= before): the pre-war years, prehistoric times
post (= after): a post-dated cheque, the post-war period
ex (= previously): his ex-wife, our ex-Director
inter (= between): inter-city trains, an international phone call
trans (= across): a transatlantic flight, a heart transplant operation
co (= together): co-exist, a co-production, my co-driver
over (= too much): overcrowded, ill from overwork, an overgrown garden, overweight
under (= too little): undercooked food, an understaffed office, underpaid
out (= more/better): outnumber the opposition, outplayed their opponents, outlived both her children
pro (= in favour of): pro-government forces, pro-European policies
anti (= against): anti-nuclear protestors, anti-aircraft guns misuse
mis (= badly/wrongly): misbehave, misgovern, miscount, a misunderstanding

2 There are some negative prefixes used to express an opposite.
   a un:  unhappy, unfair, unofficial, unemployed, unplug a machine, unpack a suitcase
   This is the most common way of expressing an opposite.
   b in:  inexact, independent, indirect, inexpert, an injustice
   NOTE
   We do not use in before l, m, p or r. We use il, im and ir instead.
   illegal, illogical; immobile, immoral, impossible, impatient; irrelevant, irresponsible
   c dis: dishonest, disunited, disagree, disappear, dislike, disadvantage
   d non: non-alcoholic drinks, a non-stop flight, a non-smoker
   e de:  defrost a fridge, the depopulation of the countryside, the decentralization
   of government

Suffixes
A suffix comes at the end of a word. For example, we can add the suffix ment to the verb state to form the noun statement. There is sometimes a change of stress and a change in the vowel, e.g. courage> courageous. Sometimes there is an extra sound, e.g. possible -> possibility, apply -> application.

   Not all combinations are possible. We can say statement, amusement, punishment etc, but we cannot add ment to every verb. The words have to be learnt as vocabulary items.
1. Abstract nouns
Some common suffixes in abstract nouns are *ment, tion/sion, ance/ence, ty, ness* and *ing*. We can use an abstract noun in nominalization. *They agreed. -> their agreement*

a Verb + *ment*: payment, movement, government, arrangement, development
b Verb + *ion/tion/ation/ition*: correct -> correction, discuss -> discussion, produce -> production, inform -> information, invite -> invitation, add -> addition, repeat -> repetition
c Verb with *d/t* -> *sion*: decide -> decision, permit -> permission

d Verb + *ance/ence*: performance, acceptance, existence, preference
e Adjective in *ent* -> *ence*: silent -> silence

Others are *absence, intelligence, independence, violence*. Examples of *ant* -> *ance* are *distance, importance*.
f Adjective + *ty/ity*: certainty, royalty, stupidity, nationality, security
g Adjective + *ness*: happiness, illness, freshness, forgetfulness, blindness
h Verb + *ing*: a building, my feelings

2. Nouns for people
a Verb + *er/or*: walker, owner, builder, driver, doctor, editor
   *There are very many such nouns, especially with *er*. Note We also use *er* in nouns for things, especially machines, e.g. a computer, a food mixer.*
b Noun/Verb/ Adjective + *ist*: journalist, motorist, nationalist, tourist
   *Note We can use *ism* to form an abstract noun, e.g. journalism, nationalism.*
c Verb + *ant/ent*: applicant, assistant, inhabitant, servant, student
d Noun + *an/ian*: republican, electrician, historian, musician
e Noun + *ess*: waitress, actress, hostess, stewardess, princess

   **Note**
   a Most nouns for people can mean either males or females, so *friends, students, doctors, motorists* etc include both sexes. If we need to say which sex, we say e.g. *her boy-friend, female students, women doctors*. Some words to do with family relationships are different for male/female: *husband/wife, father/mother, son/daughter, brother/sister, uncle/aunt*. We also normally make a difference between male/female with *waiter/waitress* and the other examples with *ess* above. But some other words with *ess* are less usual and are now seen as sexist. A manager can be male or female, so there is usually no need for the pair *manager/manageress*.

   b There is also a suffix *man*, which has a female equivalent *woman*, e.g. *postman/ postwoman*. Also policeman, businessman, chairman, salesman, spokesman. Some of these are now seen as sexist, especially in a business context, and we can say *business executive, chairperson/chair, salesperson/sales representative, spokesperson*, although the suffix *person* is still not accepted by everyone.

   f Verb + *ee*: employee, payee, interviewee
   This suffix usually has a passive meaning. Compare *er* and *I The company is the biggest *employer* in the town. It has n thousand employees/workers.*

3 Verbs
a Adjective + *ize*: modernize, popularize, privatize, centralize, legalize
   *There are many such verbs formed from abstract adjectives.*
b Adjective + en: shorten, widen, brighten, harden, loosen
These verbs are formed from concrete adjectives.

4. Adjectives
a Noun + al: national, industrial, cultural, additional, original
b Noun + ic: heroic, artistic, photographic, energetic
c Verb/Noun + ive: active, effective, exclusive, informative, expensive
d Noun + ful: careful, hopeful, peaceful, beautiful, harmful
   NOTE These adjectives end with a single i, but the adverbs have two, e.g. carefully.
e Noun + less: careless, hopeless, worthless, powerless
   Less means 'without'. Painful and painless are opposites.
f Noun + ous: dangerous, luxurious, famous, courageous
g Noun + y: salty, healthy, thirsty, wealthy, greedy
h Noun + ly: friendly, costly, cowardly, neighbourly, monthly
Verb + able/ible: eatable, manageable, excusable, acceptable, comprehensible,
defensible These mean that something 'can be done'. This sweater is washable. (= It can be washed.)
But not all adjectives in able/ible have this meaning, e.g. pleasurable (= giving pleasure), valuable (= worth a lot).
i Verb + ing: exciting, fascinating
k Verb + ed: excited, fascinated

5. Adverbs
We form many adverbs from an adjective + ly, e.g. quickly.

Vowel and consonant changes
1 Sometimes two related words have a different vowel sound.
   It was very hot. We could feel the heat.
   Also: blood - bleed, food - feed, full - fill, lose - loss, proud - pride, sell - sale, shoot - shot, sing - song, sit - seat, tell - tale
2 There can be a different consonant sound.
   That's what I believe. That's my belief
   Also: advise - advice, descend - descent, prove - proof, speak - speech
3 Sometimes more than one sound changes: choose - choice, lend - loan, live - life,
   succeed - success, think - thought

Words belonging to more than one class
1 Many words can be both verbs and nouns.
   Verb: You mustn't delay. I hope I win.
   Noun: a short delay my hope of victory
   Some words of this kind are answer, attack, attempt, call, care, change, climb, control,
   copy, cost, damage, dance, delay, doubt, drink, drive, experience, fall, help, hit, hope,
   interest, joke, laugh, look, love, need, promise, rest, ride, run, search, sleep, smile,
   sound, swim, talk, trouble, visit, wait, walk, wash, wish.
2 Some verbs and nouns differ in their stress. The verb is usually stressed on the second
   syllable, and the noun is stressed on the first.
   Verb: How do you trans'port the goods?
   Noun: What 'transport do you use?
The stress can make a difference to the vowel sounds. For example, *progress* as a verb and as a noun.

Some words of this kind are *conflict*, *contest*, *contrast*, *decrease*, *discount*, *export*, *import*, *increase*, *insult*, *permit*, *produce*, *progress*, *protest*, *rebel*, *record*, *refund*, *suspect*, *transfer*, *transport*.

3 Some concrete nouns can also be verbs.

*He pocketed* the money. (= put it in his pocket)

*We've wallpapered* this room. (= put wallpaper on it)

*The man was gunned down.* (= shot with a gun)

*The goods were shipped to America.* (= taken by ship)

Some others are *bottle* (wine), *box*, *brake*, *butter* (bread), *garage* (a car), *glue*, *hammer*, *mail*, *oil*, *parcel*, *(tele)phone*.

4 Some adjectives can also be verbs.

*This wind will soon dry the clothes.* (= make them dry)

*The clothes will soon dry.* (= become dry)

Some words of this kind are *calm*, *cool*, *dry*, *empty*, *narrow*, *smooth*, *warm*, *wet*.

NOTE Some adjectives with similar meanings take *en* as verbs, e.g. *widen*.

EXERCISE 1: Complete the sentences with adverbs. The first letter(s) of each adverb are given.

1. We didn't go out because it was raining _heavily._
2. Our team lost the game because we played very ba…………
3. I had little difficulty finding a place to live. I found a flat quite ea………
4. We had to wait for a long time but we didn't complain. We waited pa………
5. Nobody knew George was coming to see us. He arrived unex…………
6. Mike keeps fit by playing tennis reg…………

EXERCISE 2: Put in the right word.

1. The driver of the car was _seriously_ injured. (serious/seriously)
2. The driver of the car had serious_ injuries. (serious/seriously)
3. I think you behaved very …….. (selfish/selfishly)
4. Rose is …….I upset about losing her job. (terrible/terribly)
5. There was a ……..change in the weather. (sudden/suddenly)
6. Everybody at the party was ……..dressed. (colourful/colourfully)
7. Linda likes wearing ……..clothes. (colourful/colourfully)
8. She fell and hurt herself quite ……..(bad/badly)
9. He says he didn't do well at school because he was…………taught. (bad/badly)
10. Don't go up that ladder. It doesn't look …….. (safe/safely)
11. He looked at me ……..when I interrupted him. (angry/angrily)

EXERCISE 3: Complete each sentence using a word from the list. Sometimes you need the adjective (careful etc.) and sometimes the adverb (carefully etc.).

*careful(ly)  complete(ly)  continuous(ly)  financial(ly)  fluent(ly)  happy/happily  nervous(ly)  perfect(ly)  quick(ly)  special(ly)*

1. Our holiday was too short. The time passed very _quickly_.
2. Tom doesn't take risks when he's driving. He's always ……..
3. Sue works ……………She never seems to stop.
4. Alice and Stan are very………….married.
5. Monica's English is very ………….although she makes quite a lot of mistakes.
6. I cooked this meal ……………for you, so I hope you like it.
7. Everything was very quiet. There was ……….silence.
8. I tried on the shoes and they fitted me………….
9. Do you usually feel ………before examinations?
10. I'd like to buy a car but it's ………….impossible for me at the moment.

EXERCISE 4: Choose two words (one from each box) to complete each sentence.

absolutely reasonably unusually badly seriously unnecessarily completely slightly
cheap enormous planned badly changed ill quiet damaged long

1. I thought the restaurant would be expensive but it was _reasonably cheap._
2. George's mother is ……….in hospital.
3. What a big house! It's ……….        
4. It wasn't a serious accident. The car was only ……….
5. The children are normally very lively but they're ……….today.
6. When I returned home after 20 years, everything had ……….
7. The film was ……………It could have been much shorter.
8. A lot went wrong during our holiday because it was ……………

EXERCISE 5: Read some of the texts ahead and mark any of the phenomena studied in this section.

4. READING STRATEGIES I: HOW TO READ

Many students still rely on painstakingly slow word by word reading. It soon becomes clear to them, however, that they cannot read every word in the library.

You will need to practise:
- Understanding meaning: deducing the meaning of unfamiliar words and word groups; relations within the sentence/complex sentences; implications - information not explicitly stated, conceptual meaning, e.g. comparison, purpose, cause, effect.
- Understanding relationships in the text: - text structure; the communicative value of sentences; relations between the parts of a text through lexical and grammatical cohesion devices and indicators in discourse.
- Understanding important points; distinguishing the main ideas from supporting detail; recognising unsupported claims and claims supported by evidence - fact from opinion; extracting salient points to summarise; following an argument; reading critically/evaluating the text.
- Reading efficiently: surveying the text, chapter/article, paragraphs, skimming for gist/general impression; scanning to locate specifically required information; reading quickly.
- Note taking.

Knowing who the writer is, what their purpose is and who they are writing for can help us to understand a text.
Before reading
1. Think about your reasons for reading the text:
   - you are interested because it is about your subject, or it is related to your subject
   - you want background information, or detailed information
   - you want to know what the writer's views are
   - you are going to have a discussion
   - you are going to write an essay on this subject later
Each reason will influence the way you read e.g. quickly or slowly, looking for fact or opinion.
2. Look at the title, headline, any sub-headings, photos or illustrations. Use these to predict what the text will be about - the topic.
3. Think about what you already know on this topic.
4. Write down what you would like to find out from the text. You could write actual questions you would like answers to.
5. Make a note of words or phrases connected with the topic that you may find in the text.

Reading
1. Survey the text: read the first and last paragraphs and the beginning and final sentences of the other paragraphs.
   How close were your predictions?
   Do you have a very general idea of the structure of the text, what the different parts are about?
2. Identify your purpose for reading.
   a. If you are looking for specific information, read the part where you think the information will be.
   b. If you want a general idea of the whole text, read the whole text.
   In both cases ignore words or sections you don't immediately understand.
   You should now have a general idea of what the text is about and if it is going to be useful for you. Does it answer the question(s) you asked?
3. Write down in 1 or 2 sentences:
   • what you think the main ideas are
   • what your first reaction to the text is. Do you find it interesting, informative, well-argued, boring, illogical, inaccurate?
4. Do a second more careful reading, marking any new words that are important for your understanding.
   Check on the main idea and revise what you wrote if necessary.
   Decide what the subsidiary ideas are. How do they relate to the main idea? Put all the ideas together in linear notes, or as a mind map.

Vocabulary
With the new words which you think are important:
if an approximate meaning is enough,
   • try to guess the meaning using word function, context (immediate and wider) and word form
if the exact meaning is needed,
   • use a dictionary
   • ask another student, or your tutor
Difficult sentences
Divide the sentences where there are connectives or markers.

• What do the connectives mean?
• Underline reference words. What do they refer to?
• Identify complex noun phrases.
• Expand them using verbs and/or relative clauses so that they are easy to understand.
• Find the subjects, verbs and objects which go together, and, if necessary, write the whole sentence out in several sentences to show the meaning.

After reading
1. Make a list of the new words which you think will be useful for you in the future. Give:
   • definitions of the words
   • indication of whether they are nouns, verbs, adjectives etc.
   • phrases in which the word occurs
   • other words with the same meaning
   • other forms of the words
   e.g. *counsellor (noun)* = a person who gives help and support to people who have problems, an adviser [counsel (noun), to counsel]

2. Evaluate what you have read:
   • How does it fit into what you already think and know?
   • Does it confirm your ideas, add to them, conflict with them?
   • If there are opinions, do you agree or disagree with them?

TEXT 1: ‘College Delivers Lectures By Video Podcast’

EDUCATION & INNOVATION

College delivers lectures by video podcast

John Kennedy

INSTITUTE of Technology (IT) Sligo has become one of the first third-level institutions in the country to deploy video podcasts of lectures to online engineering students, allowing them to view their lectures using their iPod, mobile phone or any MP4 player with a video display.

Brian Call, a lecturer at IT Sligo’s School of Engineering, said the college’s 100 online students for whom the option of downloading podcast lectures will prove attractive. Many would work full-time in technology and would also want to study in their own time when they’re back to bed. “We view the role of the standard lecturer at third level and that of an online lecturer are somewhat similar in terms of their transpareny. We give the lecturer a handout with a microphone, explain the whiteboard with a smart board and students can download the PowerPoint slides that appear in the video recording.”

Call said that up until now online students had the option of accessing lectures via streaming media but he believes the option of being able to carry lectures on iPods or other storage devices offers students much more flexibility. “It has a number of advantages. They can assess the lecture at any time that suits them. It also means that online students who don’t have broadband at home but do so at work can download the lecture in their office and access it in their own time.”

According to Call, the provision of online lectures via podcasts is having an impact in terms of IT Sligo students applying for degree courses such as mechanical engineering, manufacturing management. “In the case of machinists we would have 20 full-time students but 80 online students. It is the only machinist course in the country where student numbers are actually doubling.”

Call believes the provision of online resources to students will maximize strongly amongst Ireland’s existing workforce, many of whom realise the need to pursue further learning but don’t have the time or the economic means to take time off work.

He cited a recent report on the role of education in the economy which says that by 2015 more than 40pc of all jobs will be for third-level graduates and over three in four new jobs will be for people with third-level qualifications.

Another report from the Eirgrid Group on Future Skills Needs stated that "projections of economic demand for skilled graduates suggest a deficit of some 40,000 graduates over the next 10 years." With only one in three of 15–34 year-olds holding a degree-level qualification, most of these people commonly at work will be required to upskill to meet the demands of the new knowledge economy.

"Online learning is providing greater access for people with family or work commitments and who wish to boost their education without taking a career break," he added.

Call said he didn’t believe the provision of video podcasts of lectures would provide a means for lazy full-time students to bolt on lectures. “I would argue the opposite for different reasons. Many students, according to our college’s own research, work part-time in 30 hours a week. It often gives a better opportunity for them to keep up. The benefits are measurable everywhere. For example, DOH’s haven’t killed the future business.”

"It is our aim to deploy video podcasts across more online and full-time courses in the college. The flexibility that podcasting brings to the third-level sector will cater to the needs of people who struggle with time to attend lectures or keep up to date," he remarked.
Tech jobs rise as applications fall

Misconceptions impact applications leaving shortfall, says report

A report from DCU has shown that the quantity of jobs advertised in the IT sector has increased by 42% over the last year, against a backdrop of falling graduate applications for computer courses.

The report shows that since May of 2005, IT job vacancies advertised on some of the country’s most popular job sites have risen to around 11,000. The report goes on to highlight growth in the IT sector indicating that it is a positive career choice with good opportunity in terms of availability, variety and salary.

Specifically, it cites US magazine, CNN Money, which featured software engineering as one of the best jobs based on criteria of growth, choice of work and salary. The falling applications rates for university courses that provide graduates for the available jobs in the IT sector have led to a projected shortfall in skills.

The graduate output from DCU for the current year in B.Sc. in Computer Applications will be around 100, down from 252 in 2005. This reflects the downturn in applications from 2003 onwards. Professor Michael Ryan, head of the School of Computing, DCU, said that “the number entering a computing degree as their first choice on the CAO have dropped by 80% since the peak.”

“DCU has dropped by less than elsewhere – we still have by far the largest number of applicants – but we have dropped from an intake of about 500 to about 150. I know of at least one course elsewhere with less than ten in first year,” continued Ryan.

Much of the problem seems to stem from the impact of the dotcom crash upon students, parents and career advisors, according to the report. “A root cause must be the lack of any solid basic understanding of what computing involves, and of the value of an education based around computing as a central theme. Because of this, students and their advisors are at the mercy of the winds of fashion, whether these involve the overblown hype of all things computing of the late 1990s, or the imagined demise of the whole sector in the early 2000s.”

Ryan added, “It’s a far cry from the image of the ‘nerd’ hunched over a computer keyboard – you are more likely to find our graduates managing their own companies, or acting as consultants or senior technical managers. They develop abilities in critical thinking, in problem solving, organisation, and management as well as an understanding of the technology, and have many career paths available to them.”

The report also cites figures from the Government’s Expert Skills Group which projects that by 2010, when the 2005 entrants would graduate, there will be a skills shortfall of between 1,200 and 2,300. The report suggests that the gap is likely to be significantly higher.

The shortfall is most likely to be met with graduates from abroad, of which, Ryan suggests, there is no shortage. “It seems clear that industry needs to be planning to recruit graduates from outside Ireland – I don’t imagine this will be a problem, but it does mean our own students are missing a good opportunity,” said Ryan.

“It is quite a turnaround, to go from exporting people to not having enough to fill the jobs we have created”, he concluded.
The pressure will blow

There is more to consider in the issue of falling ICT course applications than ill informed parents and advisors

One of the best things an editor can get is feedback from readers. It not only shows that people are reading the magazine, for which we are always grateful, but it shows that something in the magazine sufficiently inspired or interested them to communicate their views.

Cover story

Well, last month’s cover story was just such a piece and it has provoked quite a number of responses, mostly of the impassioned variety. The kernel of the story was that from May 2005 to May 2006, DCU researchers had found that there was a huge increase in advertised IT jobs in Ireland that was juxtaposed with falling applications for university computer courses. The researchers suggested that misconceptions among parents and career advisors around the Dunoon crash had led to discouraging messages for those who might take up IT university courses. The responses came from those people who were either in IT or who had been there and had left. Their take on the issue highlighted was very different from the conclusions drawn by the DCU staff who conducted the research on which the story was based.

Two of the responses can be seen on page 5.

Valid points

One of the first points made was that not every advertisement is actually offering a job. This is indeed correct and many companies, not just in IT, are guilty of using the jobs press, traditional or online, to do research. This is would, however, represent a relatively small number of the 11,000 or so jobs that formed the basis of comparison in May of this year with the previous May’s figure.

Another valid point that was made was around the stress levels in IT jobs and how, typically, IT jobs involve long hours and can be very demanding compared with certain public sector jobs in particular. I know personally of a highly-skilled and qualified electronic engineer who had gone back from a secondary school teacher after years in industry. The great irony is that his primary degree in electronic engineering is not recognised for the HDip.

Economic pressures

Despite such demanding positions in IT, and even when that demand is not, IT jobs are perceived as being less secure than they once were. One respondent points out that economic conditions have recently been such that organisations have not necessarily been driven to see IT as a cost-cutting measure through, for example, systems management and automation.

Perhaps the most ominous point that was made came through on the issue of pay. A featured respondent highlights how a recruiter from a multinational openly said they were looking for graduates from eastern Europe and mentioned a starting pay scale that was little more than what an IT graduate would have started on 10 years ago.

The other side

All of this goes to show that while the statistical basis for the story last month remains valid, the conclusions drawn by the researchers are not necessarily the only ones to consider. In an issue as complex as this, there are many more factors to consider. The ComputerScope readership have voiced its view of the issue and the picture that emerges is that, while those outside of the industry may have been influenced by the Dunoon crash in the manner described by the researchers, professionals in the industry itself have been influenced by another set of factors.

High pressure, ever increasing pay and poor job security has meant that many professionals, who have not only retained their primary qualifications but have some years of experience too, are being negatively influenced by the direction of the industry.

The drive for cost cutting, greater productivity and agility has left many professionals questioning whether they want to remain in IT. This is further exacerbated by the reports in the media of certain public sector jobs being highly paid for a perceived ‘easier’ time than the pressured world of ICT.

Just reward

As the ICT industry grows, the world recovers with a growth of a far smaller nature than was seen before the crash, it seems that there is a housekeeping job to be done. The belt tightening and extra effort that was needed by IT professionals during those lean, difficult years means now to be rewarded in some way that allays the fears of those working in the sector, not only to encourage them to remain in the sector, but to stop the messages emerging from the sector that contributes to the discouragement of students who might otherwise consider a career in ICT.
Dear Editor

As I have seen this study published a few times, I felt I had to comment. I am finishing off a master’s degree and have been wondering why I decided to go back. Although the Dotcom boom was part of the shortfall in getting students into IT, it is much more than that.

IT used to be seen as an area that had a high availability of highly skilled, good paying jobs. Over the past several years, however, much has happened and this perception has changed.

We see eastern Europeans taking jobs for lower rates over what is being paid to the Irish. This is no different in IT.

We hear about people employed in public sector jobs in Ireland being paid more than those in the private sector (and this excluding pensions!).

Many of those who went into IT found the availability of IT jobs in primarily call centre work, which is an awful job – low pay and high stress (there may be many more jobs that are for better skilled people now but this certainly wasn’t the case when people went into it before).

We publically hear of disillusioned IT people over the airwaves who have left to take up less stress public sector jobs.

The pace of change in IT is fast, the pay is not that good, the stress is high (there is a high burnout rate) and there is no job security. Companies will drop you very quickly if you don’t continue to operate at a very high level. Tell me – why would anyone bother?

Many IT students today are telling prospective students not to bother.

The recruitment manager of a multi-national was at our college recently trying to recruit. He said they were looking at employing eastern Europeans but hoped they would be able to source new graduates within Ireland. When asked the starting pay, students were told €25k. This was amazing considering the starting pay for many new IT graduates ten years ago was around IR €18k (or €22k).

What students took from this session was if they can’t get Irish students for €25k, they will be going to get eastern Europeans who will work for less.

What about that pay? We hear postal workers getting paid €70k, Garda complaining about being paid €70k plus; and prison officers and teachers all being paid so much more.

Supermarket chain Aldi regularly has ads for area managers for €65k plus a car!

If the industry wants to attract more people, they need to attract them! At the moment they take what they can, gobble them up, and spit them out!

Name withheld by request
By E-mail
FURTHER READING: ‘Wireless laptops in the classroom (and the Sesame Street Syndrome)’

Wireless Laptops in the Classroom (and the Sesame Street Syndrome)

Give instructors the option of turning off wireless Web access to accommodate their students’ learning styles, in some cases to save them from themselves.

Like many teachers, I want to be able to turn off (and on) Internet access to the students in my classroom. There may be times when access is appropriate for a particular exercise, but there are also times when I need to decrease or eliminate the number of electronic distractions. While classroom access to the Internet may be a wonderful teaching tool, it can also be a barrier to learning.

In 2002, the University of Houston published a brochure highlighting its recent accomplishments. On the cover was a photograph of a professor lecturing a room full of students. Looking toward the front of the room, it showed many of the students using laptop computers. What some in the university failed to notice, even as many others did not, was a student playing solitaire.

In 2005, a reporter from the Wall Street Journal sat in on my Management of Information Systems course, then wrote an article on what he had seen: “While Prof. Adams lectures, five students use an online chat room to post comments on his lecture, on classroom struggles, and on the meaning of his discussion questions. Another student spends nearly two-thirds of the three-hour class playing computer chess, instant messaging and viewing photos of a fraternity party posted on the Web” [6]. One of my students, he wrote, was apparently buying shoes on eBay.

As a faculty member in (and chair of) a computer technology department one would think I would value computer technology in my classroom. Much of the time I do, but there are times when I find I cannot compete. As computers moved from the machine room to the server closet, to the desktop, to the classroom podium over the past 30 years, teachers have adapted their lectures, assignments, and other coursework to the technology. These tools have had a marvelous effect on collaboration, simulation, classroom management, and information collection and dissemination. However, when the computer on the lectern became the only one of many in the classroom, things changed. Faculty need an Internet on/off switch, because students now have the world at their fingertips and simply can’t help but go exploring.

Sesame Street Syndrome

In 1972, Eda LaShan described a phenomenon—called the Sesame Street Syndrome—that can be seen in modern college classrooms across the U.S. It “teaches children,” LaShan wrote, “there are right answers to many questions, that facts themselves are valuable, that children’s questions are irrelevant—since grownups are willing to do all the asking and answering—that thinking is irrelevant, because there’s no time for it, that making mistakes is bad, and that failing should be avoided at all costs” [4]. Children growing up with “Sesame Street” and other fast-paced, information-intensive entertainment are accustomed to learning about their world this way.

In 1972, “Sesame Street” was televised only an
hour or so each day. Today, using the Internet and a variety of media, students interact with the world in 10-to-180-second gulps, and the Sesame Street Syndrome has come to describe students who expect to be entertained as they learn. They prefer audio books to real books. They prefer video games to movies and television. They often prefer online classes to traditional instruction. They prefer infotainment to drill and practice [1]. If the entertainment doesn’t come from the front of the wireless classroom, it comes from the Internet.

A student in class with a laptop with wireless Internet access can take notes, carry on one or more instant messaging chat sessions, review online coursework, keep up with current news and sports, and still work on assignments. The instructor must be able to compete with all these appealing options—being more important, entertaining, approachable, accessible, and relevant. As these are while also having the answers and being energetic, that is, infotaining.

Infotainment integrates entertainment and the information-sharing aspect of education. Teachers have long known that students respond more positively to the relevant application of theory than to the dull derivation of the same theory. However, many students have trouble identifying the line between relevant and entertaining. The days when professors would present facts and theories and leave it to the top-performing students to apply them have given way to PowerPoint animations of problems searching for answers and summations for the end-of-semester examination.

MULTITASKING

If the Sesame Street Syndrome is indeed real, one might argue that our students’ brains have adapted to the fast-paced information feeds and are able to multitask better than those without similarly trained brains. Jordan Grafman, Chief of Cognitive Neuroscience at the National Institute of Neurological Disorders and Stroke in Bethesda, MD, disagrees [7], arguing that students who multitask ultimately do not fair as well as their nonmultitasking counterparts. When multitasking, students, he says, are not actually performing tasks simultaneously but making decisions about what to turn their attention to next, then executing that decision.

This “evaluate, choose, and move” process consumes time and energy and encourages the pursuit of more instantly pleasurable inputs. The boring lecture gets fewer and fewer time slices. “Habitual multitasking,” Grafman says, “may condition a student’s brain to an overexcited state, making it difficult to focus, even when they want to.” [7]. Fast-paced infotainment seems to fit the way these students learn.

LEARNING STYLES

The popular Felder-Silverman learning styles model [3] suggests that students can be classified into five general categories: sensing or intuitive learners; visual or verbal learners; inductive or deductive learners; active or reflective learners; or sequential or global learners.

Sensing learners are practical and fact-oriented, while intuitive learners are more conceptual and theory-oriented. Visual learners learn from visual representations, while verbal learners learn by reading and listening. Inductive learners prefer to generalize from specific examples, while deductive learners prefer presentations that move from general to specific. Active learners prefer hands-on and sometimes team-oriented activities, while reflective learners want to think about problems before solving them. Finally, sequential learners prefer linear, stepwise approaches to learning, while global learners want the big picture.

These learning styles represent a range of relatively good and poor compatibility for students with Sesame Street Syndrome. The students are sensing, visual, inductive, active, and global learners; gathering facts from the Internet-connected world, usually through some visual representation. They induce a model to fit their facts, actively seek information from other sources to refine it, and manage a collection of potentially conflicting global models.

However, most university instruction assumes deductive, intuitive, and passive learning styles in which students are expected to take the sequential knowledge being presented and reflect upon it at a later time. Even with the proliferation of such presentation and teaching tools as PowerPoint, most
instructor is still verbal. It is little wonder that students are regularly lost to the Web; it fits the way they prefer to acquire knowledge.

The problem is that Googling delivers data and information, not knowledge. Knowledge is defined in [2] as “information combined with experience, context, interpretation, and reflection. It is a high-value form of information that is ready to apply to decisions and actions.” Unlike the classroom, the Web has no teacher to help students create knowledge from information.

Faculties are reacting. Some universities, including Wisconsin, Virginia, UCLA, and Memphis, have blocked or are considering blocking Internet access in classrooms, viewing it as a distraction and temptation for cheating. Some forbid laptop use altogether. Whether or not these policies represent a growing trend is unclear, but they underscore the concerns being raised by many faculty.

Restricting the use of laptops in the classroom is a difficult decision. The laptop is a ubiquitous and necessary tool for college students who go online to find their grades and assignments and correspond with classmates and professors. Many colleges and universities require that their students purchase them before even coming to school. For a faculty member to forbid their use seems inconsistent at best. All this is clearly an ongoing discussion within universities that will require new technologies and policies.

The nature of wireless communication makes controlling Internet access in the classroom a non-trivial task. For example, instructors in classrooms adjacent to one another may have different access needs, so access must be based on student identification, date, time of day, and type of connection allowed. Such systems must support ad hoc, just-in-time access to give instructors the flexibility they need to grant or restrict access to certain resources. With wireless access being delivered by cell phone companies, the battle may already be over. In any event, faculty members still need a mechanism to limit access.

Rudy McDaniels, a faculty member at the University of Central Florida disagrees, writing “If you’re going to ban wireless computers from the classroom, then you might as well ban pens and paper, too” [5]. This argument is that the instructor must be relevant and draw computer users into the classroom and out of the virtual world, and that even technology that would allow selective Internet use in the classroom should not be allowed.

These arguments usually cite the risk of censorship—typically a trump card in academic circles for deflating practically any argument—and anachronistic teaching styles and materials, a position held by many parents and students. It makes sense until we consider the Sesame Street Syndrome. We have to help these students concentrate because they may be unable to help themselves. It is difficult to equate the distraction that may be caused by a number 2 pencil with the Web.

Being able to limit access does not relieve me of the responsibility of being a relevant, energetic teacher. Turning off Internet contact will not magically transform a Sesame Street Syndrome student into a deductive, intuitive, passive learner. I must still work to reach that student. I just want a fair fight.

References

1. Adams, D. Should wireless laptops be banned from the classroom? Don’t make me compete for mind space. AFT On Campus 25, 6 (Mar./Apr. 2006), 4.
5. McDaniels, R. Should wireless laptops be banned from the classroom? You might as well ban pens and paper. AFT On Campus 25, 6 (Mar./Apr. 2006), 4.

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4. WRITING A REPORT: Understanding reports

The short informal report (also called memorandum) is a one-to-four page, single-spaced report, usually written to someone within the writer's own company or organization. It makes the existence of a problem, propose some course of action, describe a procedure, or report the results of a test or investigation.

The term informal here does not mean sloppy or casual or carelessly done; an informal report should be as carefully prepared as possible—thoughtfully written, neatly typed, and thoroughly proofread for errors. The term informal refers to the format in which the report is presented.

The short informal technical report begins with a heading section. Typically, the heading gives the following information, where Distribution, Enclosures, and References are optional.

TO: Name, job title
     Department
     Name of organization
     Address of organization (sometimes included)

FROM: Name, job title
      Department
      Name of organization

SUBJECT: Title of report (Subject may be replaced by Re or RE, for Regarding)

DATE: Date

DIST: Distribution list of other people receiving the report; omitted if there is no distribution list

ENCL: Enclosures; other documents which are included with the report; omitted if there are no enclosures

REF: References; list of particularly important background documents; omitted if there are no such documents

Note that the heading is easy to read because of its format: liberal use of white space and aligned columns. It is also functional because the first information it gives is the information readers need first.

It is obvious why writers need to put the subject and date on the report and why they need to give the name of the reader and writer. It may be less clear why they need to give the job title, department, and organization of the reader and writer. These are provided because, at one level, documents are written not to people but to and from the occupants of particular jobs. Thus, it needs to be clear what job or position a person holds. Note that none of the information is presented more than once at the beginning of the report. If the name of the organization and/or the department are included in the letterhead, then these do not reappear under the To and From headings. If they do not appear in the letterhead, then they must appear under the headings.

It is particularly important to outline a memo, even if that means simply jotting down the points to be covered and then ranking them in a logical method of development. With careful preparation, memos can be both concise and adequately developed. Adequate development is crucial to ensure clarity.

Don't assume your reader will know what you mean. State what you mean explicitly: readers aren't always careful, and some will provide their own interpretations if you are not as specific as possible.
As with other writing, if your reader is not familiar with the subject or the background of a problem, provide an introductory background paragraph. A brief background is especially important in memos that serve as records that can provide crucial information months (or even years) later. Generally, longer memos or those dealing with complex subjects benefit most from developed introductions. However, even when you are writing a short memo and the recipient is familiar with the situation, you need to remind your reader of the context.

**EXERCISE 1:** Write a short report of only two or three paragraphs. Don’t forget to include all the recommended parts.