

Helping Bill Gates Create a Smart Phone

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ITC Publications

In October 2010, I spent two days at Central Queensland University's Bundaberg campus through an invitation from my friend, Dr Rosie Thrupp, who lectures pre-service teachers. I go there every year to offer short workshops for teacher trainees, but this one was different. Rosie Thrupp and her small group of colleagues offer a stimulating and innovative program for about 500 school students per day for three days, meaning that 1500 students from Years 5–9 spend one day at the university. Each day there are about 30 presenters offering four 50-minute courses, providing each student a choice of 4 courses in the day. Each presenter offers courses which are linked to their passion or field of expertise, not all are teachers.

I was asked to deliver something on creative and co-operative thinking and I offer this here as I know that any teacher can either use the lesson as it stands now or modify the content but retain the process. Some, of course, will embellish the process and that is all to the good.

The account of the lesson that follows is accompanied by a Power Point which you can download from our web site at www.itcpublications.com.au/Powerpoints/Gateswayphone.

Though I managed to rush this lesson through in a 45–50 minute time frame, this would be far better to use at least 80–90 minutes for the task.

The lesson is titled 'Helping Bill Gates'

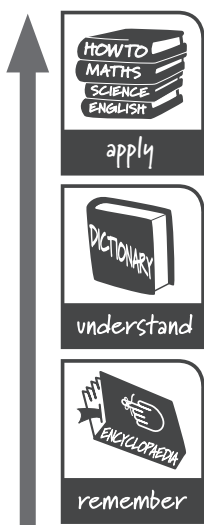


1. Opening

I showed a picture of Bill Gates (see the Powerpoint) and played a recorded message from him to me. Though my American accent is not up to scratch, I am sure that every student thought it was him speaking to me. In essence, it said "Hi Eric. I hear that you are going to the MIST (Math, ICTs, Science, Technology) Enrichment Days at CQU.

Listen Eric. I am in trouble. Apple is killing us with their iPhone. I don't have one yet and people are calling me a 'has-been'. I need your help. I need your students to analyse and evaluate all the existing smart phones and then I need them to generate special ideas for me to incorporate into my planned phone, which I will call the Gatesway Phone. I want them to help me to DESIGN a revolutionary new phone, so please hurry! Send me all their great ideas"

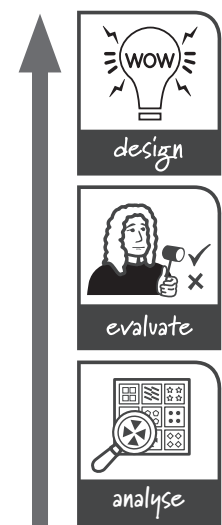
2. Structure of Thinking



We then spent 5-8 minutes becoming familiar with Bloom's taxonomy (cognitive domain) by explaining the relationship of the icons to the levels of Bloom. See graphic left.

Next we agreed that all the students were proficient in the Remember, Understand and Apply skills in terms of their familiarity with mobile and smart phones and therefore any teaching on my part was superfluous, which meant we could move on directly towards the higher-order thinking skills.

We also agreed that in order to generate improvements, one needs to be aware of the weaknesses or faults of the currently available phones. For example, Thomas Edison produced a light bulb mainly because he was dissatisfied with the then existing lighting sources.



3. Analysing and Evaluating existing phones



With the Thomas Edison idea in mind, students were asked to place their phones on their tables and working in groups of four, they were given an A3 sized Extended Pros, Cons and Questions sheet.

We used a Think Pair Four Share to generate as many aspects (Perspectives) as possible of currently available phones which we could examine.

(Think:Pair:Four:Share – In teams of four, each student ‘Thinks’ on their own for 10-60 seconds and writes down some ideas. Then, on a signal from the teacher, the students form into pairs and tell each other their ideas and attempt to think of more ideas. After 1 minute or more, on the signal of the teacher, pairs now merge into a group of four and tell each other their ideas and make one list, eliminating duplicate ideas. Then students Share this with the teacher who writes these ideas on the whiteboard).

Each group then decides which of these aspects of phones they will examine and will enter up to six of these ideas in the column marked Perspectives. Note that not each group will have the same list.

Some of the aspects or perspectives were key board, battery, emails, SMS, strength/weakness of screen, security, ease of losing or leaving behind, phone function, camera, and many more. (Cheryll. Can you enter some of these in the Perspectives column of the Extended PCQ above and enter Mobile and Smart Phones where it says Topic?)

I invited the group to offer Pros, cons and questions for a few of these aspects and then each team was given about 6 minutes to analyse and evaluate as many of the aspects or perspectives of currently available phones as possible.

Students were encouraged to concentrate on the Cons and Questions column as this is where their creative energies would be concentrated in the final step.

P C Q EXTENSION		Topic:		
Perspectives/Strategies		😊 Pros	☹ Cons	🗨 Questions
1	Key board			
2	Ease of losing or leaving behind			
3	Security			
4	Strength/weakness of screen			
5	Phone function			
6	Camera			

4. Thinking of Designing creative ideas for Bill Gates



Still in groups of 4, students were now tasked with generating or designing seven ideas each by using the co-operative design tool, 1:4:P:C:R. or 1:4:Publish, Circle, Refine

Step 1. (1)

Each student examines the PCQ and on a separate piece of paper, they record up to seven great ideas. No talking takes place. When each member of the group has completed their list (not all will think of seven ideas), they put down their pen, signaling to the other three that they are ready for Step 2.

Step 2. (4)

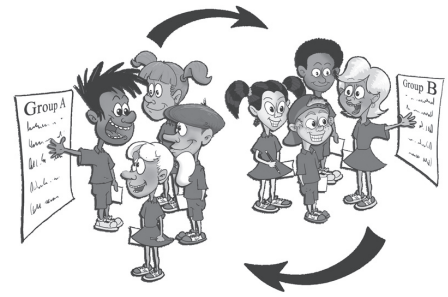
Each member of the group now takes it in turn to tell the other three their ideas as well as explaining these ideas. This can lead to animated discussion and clarification.

Step 3. (Publish)

Each group is given a larger sheet of paper (A3) and a permanent marker. Their job is to determine the top seven ideas from all the ideas generated in the group. This can also lead to animated discussion since several of the ideas will be rejected in the pursuit of finding the ‘best’ seven ideas. Analysis, persuasion, evaluation, justification, attribute listing and many more skills are evident in this step. The focus is on the group and not any one person. Results can be displayed as dot points, brief sentences, icons, graphic organizers and in fact in any way that each group chooses. When ready, each group posts their sheet on the wall at head height. One member of the group is selected to stand next to the sheet as the ‘Explainer’ or ‘Defender’.

Step 4. (Circle)

The remaining three members of each group move in a clockwise direction and visit all the Explainers or Defenders and their sheets of seven ideas in turn to see what they can learn as they circle the room. One member of each group should carry a pen and paper in order to make a note of any good idea that may be noticed. The visiting groups can ask the explainer for clarification or even challenge the Explainer on certain points if they wish. Once they have finished their visit, they move on to the next sheet of ideas until they have visited all Explainers.



Step 5. (Return and Refine)

Each group now returns to their home base with their Explainer and their sheet of ideas. Those who circled the room show the great ideas they picked up and the Explainer reports back on any points that may have been perceived to be either excellent or even weak. A discussion follows and each team can decide whether they wish to retain their original list of seven ideas or whether they wish to delete certain ideas, replacing them with ideas noticed at other groups. Ideas can be rewritten, edited, tightened and refined in any way the group feels is suitable.

As a final step, each group presents their ideas to the whole class. If the sheets are also posted at the front of the room, it is possible to detect certain common ideas from the various groups and a final class list can possibly be designed.

Innovations

Some of the innovations were remarkable, many of these coming from primary students who made up the bulk of the participants.

1. Because it is easy to leave behind, program the phone so that it recognizes the owner and when the owner inadvertently leaves without the phone, the phone emits a wailing or crying or a bleating sound to attract the owner's attention.
2. Because of battery problems, have a small solar panel which augments the battery when in sunlight.
3. If the phone is stolen, the new owner receives a shock every time it is used and the location is sent to the owner's computer
4. This was as a result of a talk on anaphylactic attacks the previous week in a school. If someone is prone to an anaphylactic attack, the phone is programmed with that person's skin touch and medical condition. The phone has a small needle with adrenalin, which can only be activated if such an attack were to occur. The sufferer then has to hold the phone to their chest. This would activate the phone, allowing the needle to protrude and the sufferer would then stick the needle into a part of the body where it is needed, injecting a small dose of adrenalin. At the same time, the ambulance, doctor, parent and school office is alerted and a GPS would show the exact location of the student. This can be modified for many types of medical conditions.



There were dozens of other ideas, and maybe I should have sent these to Bill Gates?

Observation

This is a wonderful strategy for the session after lunch as there is considerable physical movement and a great deal of student-centred learning with high engagement. This has real substance when applied towards the end of the unit once students have a good body of knowledge on the topic. It can last anywhere from 25–90 minutes or more and can even be adapted as a longer investigation over several weeks, but will require modification for teacher input at certain times. With the use of ICTs, the swapping of information can also be posted on an intranet instead of moving around the room. However, I have no experience in this so cannot comment on its effectiveness.

Teachers can apply this process to determine a strong opening or closing paragraph, establish classroom rules or considerations, design a budget or an itinerary, plan a response to a problem, design logos, mottos, house plans, design clothing and much more.

An interesting exercise is to attempt to list all the cognitive, affective and social skills that are being displayed by the students during this process. This is easy to accomplish since the teacher is not really involved apart from ensuring that the process is clearly understood and explained. Try it out sometime and feel free to modify the process to suit your own context and needs.

More explanation on the thinking tools used in this lesson can be found in the 2011 innovative teachers' companions