

International Baccalaureate

Information Technology in a Global Society

Portfolio

Big Brother is watching: what are the impacts on society?
(Politics and Government)

June 2003

Student No. 1

XY International School

News Item:

Mackenzie, Kate 2002, *Data-spying deal between police, ISPs*,
<http://australianit.news.com.au/articles/0,7204,4180888%5E15306%5E%5Enbv%5E,00.html> [May 2003]

Presentation of the Issue

Whilst the Internet has become a valuable resource for much of the Australian community, it has also been misused, and has led to numerous Internet assisted crimes against families and businesses alike. Dubbed ‘The Telecommunications Interception Amendment Bill’, the new law will provide the Government with greater access to Internet surveillance through the cooperation between ISPs and Australian law enforcement agencies (Mackenzie 2003). Australian ISPs are now required to aid in the interception of sensitive data and are obliged to work openly with government departments, such as federal police and ASIO (Australian Security Intelligence Organisation).

The amendment bill proposes to counter the increasingly prevalent problem of electronic criminal activity by providing more practical, widespread and efficient surveillance over the Internet’s usage. By closely monitoring Internet usage, the Government aims to intercept criminal activity before damage can be dealt. Criminals will be found and brought to justice and as a consequence, Australia will become a more pleasant environment, less likely to be under attack by Internet assisted crime.

A study by NOIE (2002) shows “52 percent of Australian households are connected to the Internet”. The bill widely impacts over the Australian community – innocent and criminals alike. It impinges the right to use the Internet relaxedly and freely, without the psychological detrimental feeling that their every move is being monitored. Also the bill will negatively affect the ISPs and the Government through the monetary cost, the time, effort and human resources to set up and maintain the surveillance technology, which might be better spent on other criminal investigations.

The issue is explained in paragraphs 2 and 3.

The IT Background of the Issue

The NSW Police (2002) claim that exploitations of the Internet have doubled from 1999. If such a trend continues the Internet will be too unsafe to be used without taking an unreasonable risk. As the Internet becomes more commonly used as a tool in criminal, terrorist and cyber terrorist activity governments around the world are beginning to re-evaluate their stance on its surveillance (Miller 2001, Kane 2002).

Some trends but no developments.

The ISP, provider of direct access to the Internet backbone, is essential in the surveillance. All Australian use of the Internet will be continually monitored by automated ISP computer mainframes for specific security flags. Flags include sensitive key words such as bomb, virus, plane or Allah in particular combinations, or access to sensitive Internet pages. When a security flag is raised by an ISP server, an alarm is raised and the computer begins to record the user's keystrokes and mouse clicks, for deeper police analysis of the possible security threat. Either the possible threat is dismissed or acted upon defensively by police, leading to a decrease in successful cyber crimes. *IT concepts well described and some developments; not enough detail, particularly of developments for explanation, and certainly no analysis.*

The Impact of the Issue

The legislature will increase the number of arrests and decrease the amount of crime that is committed through the Internet. Hackers, cyber terrorists and white-collar criminals will be under threat by the system as their every keystroke and mouse click is monitored for clues to their criminal activities. Such electronic criminals will now not be able to communicate and work freely without being caught by the surveillance system and dealt with by the judicial system. So not only does the system deter and scare people from partaking in illegal activities but it also helps the police find, catch, and punish such offenders. This is a great benefit as the automated system saves police's time, money, and human resources as the computer does the majority of the police's work for them and allows police to do other work that requires human influence. *Explained and analysed.*

Under the Bill, ISPs are required to cover the costs of any data processing mainframe computers and staff to maintain them. Many Australian ISPs will be sent out of business as they won't be able to afford the requirements of the Bill. This will result in loss of jobs and inter-business competition. Resultant monopoly ISPs will be able to charge higher rates, affecting the public. Despite this a small increase in charges, and a few job losses, are a small and justified price to pay for national security and wellbeing of Australia as a nation. *Analysed and evaluated.*

Both criminals and innocent Australians will be under continual surveillance, with no human judgement of whether their confidentiality should be violated. A large number of people will feel paranoid or uneasy about their Internet being watched. Some will be scared of using Internet freely, for fun or personal use, and this is simply wrong, unjust, and will cause huge negative psychological impact on a majority of Australians. *Analysed.*

Overall, there is a large cost to monitor a majority of innocent people, for a chance of tracking a handful of prospective criminals. As it is not fair to put so many blameless Australians through such stress, breaches of privacy or to send ISPs bankrupt for the capture of a few cyber criminals, I see the Bill as a disproportional response to the problem of cyber crime and should not be implemented in its current form. *Evaluated.*
As none of the arguments have been substantiated with cited references maximum mark is 3.

Solutions to Problems Arising from the Issue

One of the most potent drawbacks of the surveillance system is its extremely high cost. A very practical solution would be to force every personal computer to do the sorting for the ISP. This could be achieved with a security feature embedded in the computer's operating system. This security feature would be hardwired and protected from being tampered with by users. It would notify the ISP, through the Internet, if security flags were raised and, in turn, police would be notified.

Solution outlined. The 'security feature' has not been explained.

This solution would dramatically decrease the cost of computer infrastructure needed to sort through the raw data as much fewer ISP computers are needed. This effectively eliminates the problem of cost and still successfully monitors and raises warnings, as before, and it does not limit the user, ISP or Government.

Partial evaluation - but solution is only outlined.

Another solution would be to offset the ISP's cost by obtaining government and corporate sponsorship so as to pay for the additional processing computers. Commercial grants could be obtained in exchange for small, unobtrusive advertising banners. These banners would pop up onto the screen when the user is surfing the Net so as to pay for the data interception processing mainframes.

There is a limited description of the second solution.

Summary of this criterion: 1st solution is outlined and partly evaluated; second solution is described.

Word Count: 996

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NEWS ITEM - EXTRACT

LAW enforcement agencies are developing interception agreements with large ISPs, as the Federal Government prepares to introduce new laws on data spying.

Investigations by The Australian IT have revealed agreements on data surveillance are being developed between large ISPs and organisations such as ASIO, the Australian Federal Police, and state crime authorities. Meanwhile, the Federal Government is preparing legislation that will increase the obligations of ISPs to help criminal investigations.

ISPs are already obliged to provide information to assist federal and state law enforcement agencies when a warrant is issued. But some agencies have voiced concerns that a lack of understanding of technical specifications, charging and data delivery are frustrating attempts by police to gain information.

According to sources within the ISP industry, who did not wish to be named, various law-enforcement agencies were working directly with large ISPs to formalise the storage and delivery of data, particularly real-time communications of suspected individuals.

New capabilities, such as the ability to replicate in real time all data transmitted by a suspect's modem, were being developed, the sources said.

International Baccalaureate

Information Technology in a Global Society

Portfolio

What are the effects of laptops on education?

(Education)

November 2003

Student No. 1

XY International School

News Item:

Belanger, Yvonne, 2000, "Laptop Computers in the K-12 Classroom." <http://ericit.org/digests/EDO-IR-2000-05.shtml> [14 June 2003]

Presentation of the Issue

Some studies claim that laptops are linked with increased student motivation, improved class attendance, and a "sustained level of academic achievement" (Belanger, 2000). However, negative aspects can also be raised, for example, that laptops prevent students from concentrating on their school work, and degrade learning (Borja, 2000). Not all students can afford laptops to buy a laptop for school, so their introduction has also raised the issue of equality and financial discrimination (Corcoran, 2002). *Has contrasted differing researchers' views, so is going beyond simple "description".*

Laptops at schools have also an extended social impact on global equity, by helping to bridge the digital divide in third world countries (Lent, 2003). The donation of laptops to underprivileged schools around the world not only aids underprivileged students during school hours, but also allows students to bring their mobile computers home to their parents, slowly and comfortably exposing the wider disadvantaged community to the prospects of technology.

Has taken this further by looking at a social issue, and then explained its importance.

IT Background of the Issue

Laptop usage in U.S. schools increased by 43% in the 2001-2002 school year (Suryaraman, 2002). Last year, 15% of school districts in America were participating in a laptop initiative (Corcoran, 2002). Although desktop computers far outnumber laptops in the school environment, an increasing trend in laptop usage at school has become clear: "The direction we're moving is absolutely away from PC labs" (Suryaraman, 2002). As more and more educational tasks require, or are enhanced by technology, it is predicted to be only a matter of time before a personal computer at school becomes essential as pen and paper (Suryaraman, 2002). *Clear trends have been explained.*

The laptop is small and light enough to be easily carried between classes, and home, by hand. The laptop has become possible with the development of thin LCD monitors, long life batteries, and low heat processors. Stronger built, cost effective models of laptops have been produced specifically for students, such as the I-book or the StudyPro (Belanger, 2002).

Developments have been explained.

Now, with wireless network cards, laptops can share file storage between teachers and students, internet access, and printing facilities, making them as effective as a desktop computer, and more flexible.

Some concepts in paragraph 2 and more above. The concepts are only described.

The Impact of the Issue

The use of laptops at school has been claimed to "improve the speed, quality and depth of their work" (Beck, 2002) and to be responsible for a "significant increase on standardized tests" (Learning with Laptops, 2000). Education studies report that these improvements are due to an improved attitude towards learning, as laptops encourage a fun, hands-on approach to education (Belanger, 2002). *Positives explained.*

Also, disabled or struggling students are benefited by the flexibility of owning and maintaining their own personal laptop. Students with particular areas of individual need can install their choice of programmes that will help them learn more in a school day. For example, a program called Co-Writer can help dyslexic student who are struggling with spelling (Ansary, 2002). *Positives explained.*

On the other hand, the added mobility and flexibility of laptops have allowed students to become more easily distracted from the focus of education (Borja, 2002). Misuse of technology at school, such as file swapping, pornography, and instant messaging have become more prevalent at schools with the introduction of student laptops.

Negatives explained.

Education has a great affect on a student's future life, and job opportunities, so the affect of laptops on education quality is an issue of the utmost importance. Weighing up, the motivational benefits outweigh the prospect of added distractions, as such distractions are solvable by teachers enforcing policies at the school. *Evaluation.*

Lawrence Hardy claims laptops cause economic discrimination against students of lower socio-economical backgrounds, who would not be able to afford to buy their own laptop for school (Hardy, 1999). However, subsidised leasing programmes have made the financial burden to parents more affordable (Hardy, 1999). Resultantly students from all socioeconomic backgrounds will have similar opportunities to use technology both at school and home. *Explanation and analysis.*

The issue of educational benefit is more important than the financial issue. While the negative issue of financial will lessen in the near future as government and public support grows, and technology costs decrease, the issue of education must be

addressed immediately, before lifelong damage might be caused to a student's education. *Evaluation.*

Solutions to Problems Arising from the Issue

The main problem regarding laptops is the ability for students to become distracted and become off task.

One solution to the problem of distraction is to create a set of strict laptop usage policies that make clear what is and what is not appropriate at school. The policy should describe what third party programs are allowed to be installed or executed, explain the prohibition of games, outline acceptable use of instant messaging and internet usage, and make clear the situations when mp3s are allowed to be used. By setting up a detailed set of rules there is no excuse for the misuse of computers at school. This policy would be enforced by teachers patrolling computer usage for students who break this policy. If a rule is broken, the student will be given a detention, and be temporally prohibited from using their personal laptop during school hours. This solution is limited as it relies on a student's honesty. It does not really solve the problem as students can hide their mischievous actions from teachers on the other side of their screens

The first solution has been thoroughly explained. The limitations have been highlighted.

Another solution is to give the teacher of a class the ability to view student laptop usage, through screenshots of what is present on the student's screens. This could be made possible with a small mandatory utility that captures regular pictures from a student's laptop, and passes this information through a wireless network connection to the teacher's computer. The teacher could view a number of student's screens at one time, presented on the teachers screen as small, continually updating thumbnail images. The teacher would be able to notice on his or her screen if a student was visiting an off topic internet sight, listening to mp3s, chatting to other classmates, or otherwise misusing their computer privileges. It involves less personal time and effort and can be used also during the normal teaching process. In such cases, the teacher could confront the student, and make sure they returned back to the task at hand. This

solution is limited as it involves a breach of privacy. The purchase of software means it will be more expensive to implement than the policy.

The second solution has been thoroughly explained. The limitations have been highlighted.

Word Count: 979

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NEWS ITEM - EXTRACT

The future of mobile computing in K-12 education is still uncertain. Laptops may never become as common in classrooms as hand-held calculators. Solutions for issues of cost, technical support needs, security, and equitable access are challenging for many schools. Many schools with laptops, however, remain positive and enthusiastic about the changes observed and benefits their students derive from access to portable computers. Although many laptop programs are young and studies are still in progress, research has shown educational benefits from the use of laptops, particularly with respect to increasing student motivation and creating more student-centered classrooms. Continuing improvements in student portable computing technology as well as models of successful programs may make laptops an increasingly attractive option for K-12 educators and technology planners.

International Baccalaureate

Information Technology in a Global Society

Portfolio

Instant Messaging – Blessing or curse to businesses?
(Business and Employment)

March 2004

Student No. 1

XY International School

News Item:

Hu, Jim, P. 2003, “IM: From fad to big business and beyond”,
<http://zdnet.com.com/2102-1104-992391.html?tag=printthis>

Presentation of the Issue

In March 2003 an estimated 77,000,000 unique users used an instant messaging client, half of the total internet population (Hu; Festa, 2003). Another survey conducted in June 2002 showed that 66.8% and 54.5% of Internet users used instant messaging in Hong Kong and Singapore respectively (NetValue, 2002). The huge popularity of this communications medium has also influenced business. In May 2002 12,600,000 office workers, or 31% of online workers, used some form of instant messaging (Nielsen NetRatings, 2002).

Instant messaging offers many advantages to business: real-time communication, direct file sharing (Tyson, Date Unknown), streaming content (Tyson, Date Unknown), videoconferencing and networking of Internet devices (Hu, 2003). Collaboration of projects and exchange of data between companies will therefore be easier and more efficient (Hu, 2003), resulting in higher profitability.

However, companies are also concerned over security and manageability issues. Many free IM clients today do not offer logging, and consequently companies are not able to monitor the actions of employees, allowing them to casually chat and causing loss of productivity or even leak company documents (Foo, 2003). The file-sharing feature of IM could also potentially create a tunnel through security measures, as viruses may enter through transferred files (Frase, 2001) to corrupt data or steal valuable information. Thus from this seemingly harmless tool, businesses may lose more money than they gain from the benefits of IM, which at the very worst could lead to a company collapse.

This is a full explanation of the issue, giving good coverage of the social consequences it raises.

News article (Hu) is referred to throughout.

The IT Background of the Issue

The affordability of computers and the widespread use of the Internet have caused people to demand better networking and quicker communications. E-mail for many is too slow, as the other person may not be present to receive it instantly (Hu, 2003) and videoconferencing requires expensive equipment and a broadband connection. IM takes a compromise between the two and consequently has become *Developments + some analysis.* successful with users.

Corporate usage of IM is expected to grow to 687 million enterprises by 2004 (Guzzo, 2002) whilst a survey of a number of enterprises reported that they will all take up IM by 2007 [Diagram 1] (Hu, 2003) *Trends supported with factual evidence.*
Good use of a graph with the author cited.

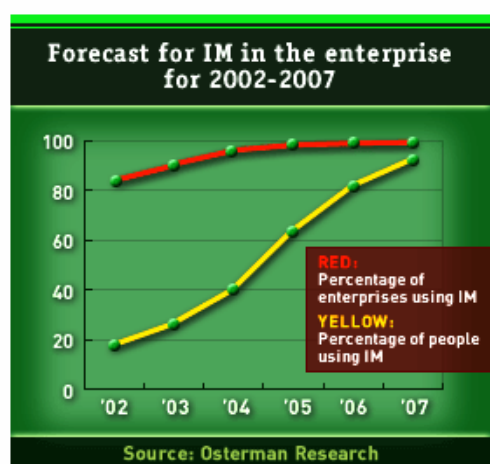


Diagram 1 (Hu, 2003): A survey of IM users by Osterman Research

Most of the IM clients available today work in similar ways. A contact list [Diagram 2 i)] is always present, displaying the other users of the client you wish to communicate with (Tyson, Date Unknown). When one of those contacts is online and using the IM client notification appears, and double-clicking on their icon will open up a window [Diagram 2 ii)] in which instant messages may be viewed and sent (Tyson, Date Unknown). A bar will allow you to type a message [Diagram 2 iii)], and after sending your message will appear in the same window along with other messages typed by your contact(s). *Concepts explained.*

In addition, a button on the client may allow you to share files with other users [Diagram 2 iv)]. This will open up a TCP port and upload the file to the other person's hard-disk directly. If you have a microphone and/or a web-cam, some IM clients may also allow voice conversations and teleconferencing functions [Diagram 2 v)]. "Tabs" may also be included to display streaming content, such as stock quotes [Diagram 2 vi)].

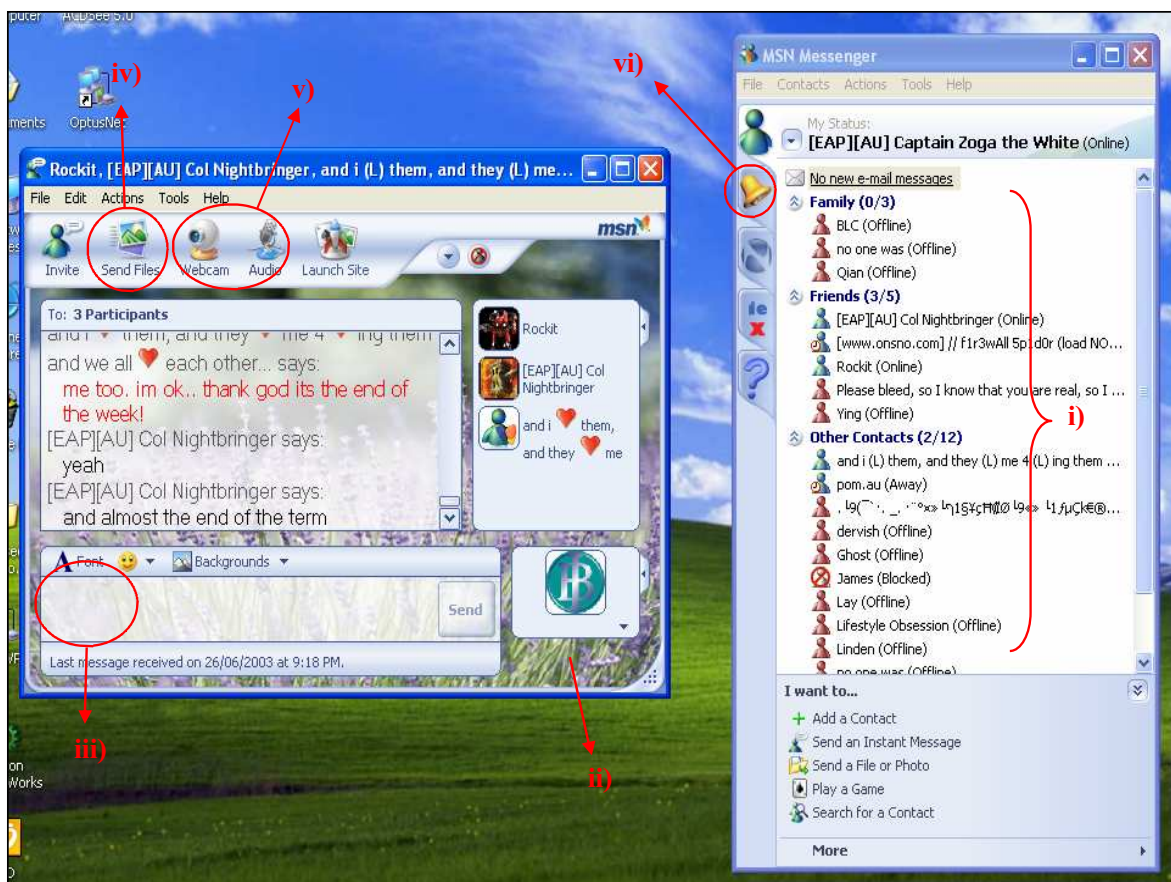


Diagram 2: An example of an IM client - MSN Messenger 6

The concepts have been clearly explained. The screenshot is an excellent way of explaining the concepts whilst conserving words. It is referred to in the text and the label shows the source. Difficult to imagine how this could have been done any better!

The Impact of the Issue

Instant messaging affords business many advantages. Because IM is free, companies can cheaply communicate in real-time with clients and/or business. File sharing without IM would be a lengthy process, usually done by uploading and then downloading e-mail attachments, which is obsolete compared with IM's direct transfer features. Voice conversations and videoconferencing are not only supported in many IM clients, but can be performed without previous notice. In situations such as the worldwide SARS virus outbreak, face-to-face meetings are not possible, and thus companies hope that IM will be able to serve as a substitute (Konrad, 2003). Streaming content such as real-time stock quotes (Tyson, Date Unknown) can also be integrated into clients. All this would improve productivity and cause higher profitability for companies. *Explained and analysed.*

However, it may be argued that IM may cause employees to chat casually with contacts (Glasner, 2002b), wasting Internet bandwidth, and thus productivity both for themselves and for other employees \ *Each paragraph explains a piece of research and then goes on to analyse the impact on society.*

Security concerns also arise with file sharing, as it opens tunnels through firewalls. A file received by employees may carry undetected viruses (Frase, 2001), which then may destroy files or steal company information and transmit them to a hacker. If this happened, company secrets with financial value may be stolen and company servers would be down, severely reducing productivity. *Explained and analysed.*

Lack of logging functions on current IM clients affect manageability, and companies fear they are breaking the law in not recording conversations with customers (Glasner, 2002b). This inability to track the actions of employees may also provide an avenue for them to share out confidential company documents to other people (Foo, 2003), thus losing money for companies, and to send messages which include harassment and discrimination (Guzzo, 2002), thus creating a hostile workplace for employees. *Explained and analysed.*

Overall the concerns over security and manageability, as well as the lack of effective solutions to combat them, have been the biggest issue for businesses. IM is further hampered by the lack of interoperability of different clients (Olsen, 2002) and lack of

support of languages other than English (Creed, 2001). IM manufacturers are looking into the ways to overcome these inherent problems but still more development is needed for IM to become a viable business option. *Evaluated - the word "overall" at the beginning of the paragraph indicates that the student is now into "evaluation" mode.*

Solutions to Problems Arising from the Issue

Whilst decreased productivity is of great concern, more companies believe that security breaches, such as viruses in received files, are a bigger problem (Glasner, 2002a). Hence one solution is to use anti-virus software (Frase, 2001). Anti-virus software uses virus templates to detect computer infections and runs in the background to scan files whenever they are accessed or created, so viruses should be detected and removed as soon as they are received. The best ones also scan within IM clients, furthering reducing the occurrence of viruses.

The first solution has been explained.

The advantages of anti-virus programs are that they detect and remove the majority of viruses; however, they may cause the inconvenience of updating templates regularly on all computers. Also, their effectiveness is reduced, as they cannot detect very new and polymorphic viruses because there is no corresponding template.

The first solution has been evaluated. Two limitations have been highlighted.

Another solution is to implement extra policies. The policies may require employees to undertake compulsory IM training, so that they can be taught scenarios that might compromise security. Other policies may also require that file sharing occur only between employees and trusted contacts, so the risks of receiving viruses are reduced.

The second solution has been explained.

Policies are free and easily changeable, however, even trusted contacts may obviously send virus-laden files and policies affords no way in which viruses can be detected and/or removed, so it is ineffective in many cases.

The second solution has been evaluated.

Word Count: 1000

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NEWS ITEM - EXTRACT

"A number of execs and upper management were using AOL Instant Messenger. They viewed it as a tool to communicate with peers, board members and to communicate with one another because e-mail was too slow," said Doug Utley, who was on the information services team at the time and is now product manager for Sprint's Web services conferencing unit. "When that started happening, it became more acceptable."

To Sprint and many other companies, instant messaging has evolved from a teenage fad to a valuable communications tool that is central to everyday business. Companies are using IM not only to send real-time messages, but also to collaborate on projects, exchange data and create networks linking all types of Internet devices.

	<p><u>ITGS – Portfolio</u></p> <p><u>Final Marks</u></p> <p><u>Student No. 1</u></p>
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Date	Area	A	B	C	D	E	F
June 2003	P&G	4	3	3	3	1	3
Nov 2003	EDU	4	3	5	5	2	4
Mar 2004	B&E	4	5	5	5	2	4
FINAL		4	5	5	5	2	4

Final check before determining the total mark.

There are three pieces of work.

The pieces are from 3 different Areas of Impact (if not marks must be deducted in Criterion A)

The final mark for each criterion must have been achieved on at least one of the pieces.

NOTE:

The final mark should represent the level of achievement reached by the candidate by the end of the course

EXPLANATION OF THE FINAL MARKS

Criterion A – obviously a 4.

Criterion B – professional judgement needed here. Although two pieces scored a 3 by the end of the course this candidate had definitely reached a 5. Criterion B in the last piece was outstanding.

Criteria C, D, E, and F – clearly the candidate has reached the top mark in each of these criteria by the end of the course.

TOTAL 25