ITGS

Overall grade boundaries

Higher level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 10	11 - 21	22 - 34	35 - 45	46 - 56	57 - 67	68 – 100

Standard level

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 9	10 - 19	20 - 32	33 - 44	45 - 55	56 - 67	68 - 100

Higher & standard level internal assessment – Project

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 3	4 - 7	8 - 11	12 - 15	16 - 18	19 - 22	23 - 30

General comments

The requirements for submitting the ITGS Project sample are detailed in the *Handbook of Procedures Section B* which is updated on a yearly basis. *Forms.zip* file must be used for submitting the Documentation and Product. A screencast and the 3/CS form are required and must be included in each project in the sample as indicated in the Handbook. The project sample is entirely electronic with each student's project burned on individual CD-ROM/DVD. No paper is sent to the moderator.

The screencast ensures that the moderator can actually see the completed product. The candidate must explain his product to the moderator, demonstrate that it is fully functional and highlight the techniques used in Criterion E. This is particularly important where products have been created in platform-specific applications. In such cases, there are no alternative file formats that can be used to submit the product and the moderator may need to use the screencast to understand the product and the techniques used. Screencasts must not be longer than 5 minutes.

The Teacher Marks Justification Form which may be included in each project in the sample is

very helpful to the moderator in understanding how marks were awarded by the teacher. This is also helpful in providing meaning feedback to the teacher. Most ITGS teachers submitted this form with their sample.

Candidates need to be made aware of the International Baccalaureate (IB) Academic Honesty Policy. Candidates must be carefully supervised so that they develop their own documentation and product. There were some reported instances of material being copied from Exemplar 1; Keith Findlater Photography. Teachers may wish to demonstrate the exemplar material, but it is strongly recommended that students do not have electronic or printed versions of material from these exemplars or from other ITGS projects that have been developed.

The range of projects, choice of clients and problems were appropriate to ITGS Projects. Websites, videos, DTP products and databases were the most frequent solutions. Some products were too simplistic and did not reach the suitable levels of complexity expected of an ITGS student. Templated solutions can only be used where it is possible to alter the structure of the template (see requirements for Criterion D) and where complexity can be achieved by adding functionality to the template or including content that is regarded as complex.

It is important that the client understands the processes involved in the ITGS project and that the student maintains close contact with them throughout the development process. In most projects there is no clear evidence that this contact was maintained from Criterion A through Criterion F.

Products must be submitted in the Product folder in the original file format as well as in a cross-platform format. For example, a DTP product may be submitted as an Adobe InDesign product, but must also be submitted in PDF format as well.

No Product folder may be left empty. In instances where a templated product cannot be exported from an online website, sufficient evidence such as original and manipulated images included in the product must be provided in the Product folder.

Some projects arrived after required date of submission April 20. Teachers must allow for sufficient time to complete the administrative requirements involved with submitting the Project so that the sample is received by the moderator by the due date. Many moderators of the Project are also examiners of the externally assessed components which can mean that any late submissions with issues that may affect the final mark of the candidate cannot always be resolved.

The range and suitability of the work submitted

Most schools are now meeting the requirements for the sample (ie Cover Page, Documentation, Product, Screencast and 3/CS form). There were a few schools that did not submit screencasts and these had to be requested. Most cover pages were linked appropriately to the documentation and to the product in the product folder.

In most cases, the ITGS Project identified a real client and a genuine problem that required an IT solution.

Some schools presented similar projects in the sample (eg: they were all websites, or they were all very similar access databases). It is unlikely that these candidates were focused on the client and their unique problem, but rather on finding a client for whom they could create a particular kind of product. This is not the correct approach for the ITGS Project. In other schools it was clear that candidates enjoyed creating an original IT product that would address their client's specific problem and as a result produced good work doing so.

Some candidates did not understand the requirements for specific criteria and consequently, some parts of Criterion A through Criterion F were incomplete or did not meet the requirements. In most cases the final documentation was not proofread to ensure that the information throughout is consistent and complete. The final CD-ROM/DVD must be checked to ensure that the cover page, the product and the screencast function as required.

Candidate performance against each criterion

Criterion A

In most cases the investigation document was acceptable. However, the questions in the consultation interview were not well thought out and did not support the claims in Criterion A. The questions should address the candidate's problem, the inadequacies of the present situation, what solutions have been attempted in the past and why they did not work and requirements that the solution would need to address.

It was clear that in some cases that the candidates began the Project by choosing the software to be used rather than selecting a client and identifying a problem as the first step of the process.

Some candidates failed to cite the interview in Criterion A Investigation. This resulted in only 1 mark being awarded.

Candidates need to be reminded that clients under 18 years of age must have a co-client who must also consulted throughout the development from Criterion A through Criterion F. The ITGS teacher **may not** be a client (see Guide page 59).

Criterion B

The Requirements specification needs to provide the necessary information about how the product is created and implemented. Candidates often forget to mention all of details relating to software, online tools, hardware and networks. Often there are inconsistencies between the tools stated in Criterion B and those actually used in Criterion D and Criterion E.

Input and output needs are not fully understood by some candidates. They fail to indicated what specific input they will need (or the product will need) and what output the product will provide.

Most candidates fail to complete the security section or make it too general. System interaction was not understood. System interaction can either refer to the interaction that must take place when a product is being used or the compatibility that must exist between systems

when the product is being developed or a combination of both.

The candidates often struggle with the Specific Performance criteria. In many cases the Specific Performance criteria cannot be tested. The Specific Performance criteria should address the requirements for functionality and the content in the Product. The candidates need support in developing these criteria as they need to be "**SMART**" Goals: **S**pecific, **M**easurable, **A**ttainable, **R**ealistic and **T**ime-bound.

The Specific Performance criteria are also directly related to the testing (Criterion D), the product (Criterion E) and the evaluation (Criterion F).

Justification of the chosen solution was reasonably well done.

Criterion C

This has improved from previous sessions and all criteria from A through F were included in the development. More detail relating to the specific product and client has been included in every date, and some very good explanations of the steps have been included. There were some weak schedules where candidates missed some stages (e.g. missed testing or implementation) or did not refer to their specific product or client.

However, this was one area where the material from the exemplars on the OCC was copied and slightly modified instead of being planned for the specific client, problem and product.

The entries must be specific to the client, problem and product and not generic entries that could apply to any IT product of a similar type.

Criterion D

Insufficient detail is provided on the product design form and there were often significant omissions. In some cases the design was not consistent with the final product which was created in Criterion E. Candidates were not always aware of the correct way to show the overall design and internal design for a DTP product, database, video or website. Sketches and designs before the product is created need to be included. No screenshots should be included in this criterion.

The resources section was often limited to comments like "pictures and data from the client". Very few candidates used a formal citation format. All resources that will be used in the making of the product must be listed.

Criterion D should include the techniques that will be highlighted in Criterion E and also any other relevant techniques that were used in the making of the product.

The testing components were poorly executed and did not test both functionality and content. Few candidates provided a detailed testing plan based on the Specific performance criteria in Criterion B, and even fewer provided a detailed response to the test they outlined. Sufficient content and test data must be included in the product in order for all of the features of the product to be tested and for the product to be considered fully functional.

The signature from the client in this section was either typed in a different font (usually a scripting font) or scanned. There was no way of knowing that this signature was actually provided by the client for this criterion. The same scanned signature was often used in the evaluation for Criterion F.

Criterion E

The techniques used should be listed at the start of Criterion E along with the overall structure of the product that was created (see Criterion E for Exemplar 1: Keith Findlater Photography).

All of the marks for Criterion E are based on the documentation, not on the screencast. The screencast demonstrates that the product is fully functional and highlights the techniques and shows where in the product they are used, but its role in this criterion is to provide supporting evidence. Screencasts are required and must be no longer than 5 minutes in length.

Some projects used advanced techniques. In order to achieve higher marks techniques must be "justified" why they were appropriate and used rather than described how they were used. In most cases, screenshots were only accompanied with description of how the techniques were used, limiting the marks awarded to a maximum of 4 marks. Screenshots must be legible and there should be arrows, circles or other markings on the screenshot to show what part of the image is referred to in the text.

Appropriate equipment and methods must be used in collecting and creating content (i.e. video, photographs). Candidates need access to a tripod and external microphone for video content. Weak audio tracks, distorted photos, pixilated images and shaky video clips are unacceptable in ITGS products. Huge image files cause webpages to load very slowly. Candidates should be research guidelines and examples of successful products of the type that they are making.

Wherever code is included as a technique, the code must be documented and also a screenshot must be included to show the effect of the code. Where code has been adapted from a source, the source must be cited.

Criterion F

Many candidates failed to use the specific performance criteria from Criterion B in collecting feedback from the clients. They often presented information that was not present in the interview, or the interview was a simple yes/no questionnaire for collecting feedback from the client.

Similar to the consultation in Criterion A, not enough thought was given to the questions asked. The evaluation should address three aspects of developing the project:

- The effectiveness of the process of development and consultation with the client throughout the process.
- To what extent each of the specific performance criteria in Criterion B were met.
- Recommendations for future development of the product. These should not include

modifications that were necessary in the current product.

In some instances where clients were relatives or acquaintances, they indicated that the product met their needs and it was doubtful if this could be the case. This illustrates the need for on-going supervision in the development of the ITGS candidates' products and realistic evaluation of the final product.

The question of authenticity of the feedback arises from use of the same scanned signature from Criterion D.

Criterion G

Most products worked. Also, most candidates used correct folder names and file names, the project cover pages worked and files and folders were correctly included in the CD-ROM/DVD.

However, the contents of websites were often not well organized in the Product folder. Some candidates need more advice in this area. Products must be fully functional and contain sufficient content.

Achieving 3 marks for Criterion G should be straight forward, but it is not. Reduced marks occurred because:

- The product is "empty" or has very little content. Spreadsheets or databases may have the overall structure, but insufficient content. This is not a real solution. Similarly some websites were limited In functionality.
- Content is missing in the product folder. Even if websites cannot be exported, evidence from the making of the product must be included in the Product folder. No product folder can be empty.
- Cover pages need to be thoroughly tested after the CD-ROM/DVD is burned. There were cover pages where some of the links did not work, but the teacher awarded full marks. One way to demonstrate that the cover page is completely functional is through the screencast and by providing verification of testing on the 3/CS form. The nature of the links should be checked to ensure they are relative rather than absolute.
- The file names and/or folder names were changed from those in *Forms.zip* which also means the cover page may not function properly. The default settings for the links on the cover page are for pdf files using the original file names so should not need to be changed.

Recommendations for the teaching of future candidates

Candidates need to understand the requirements of each criterion. The process for guiding candidates is best achieved by having candidates complete each criterion and submit it for feedback before moving on to the next stage of development. Feedback is allowed on one draft.

Candidates in a class should not be guided to produce the same kind of products and find clients with problems that can be “matched” to the particular product. Candidates need to identify a client who has a problem which can be solved with an IT solution and then determine the most appropriate IT solution. The client needs to fully understand the requirements of the ITGS Project and agree to work with the candidate throughout the stages of development from Criterion A through Criterion F.

Candidates need to spend more time on Criterion A through Criterion D before beginning to make their product. They need to research both guidelines and examples of good practice for the type of product that they are marking.

Ensure sufficient time is allocated for the project. Candidates may run into unexpected difficulties that take time to resolve.

Teachers should use the OCC by reading posts from other ITGS teachers on the forum or by posting questions to it if they need more guidance about a particular criterion that is unclear, whether a solution is appropriateness or about the level of "complexity" of certain techniques.

The candidate should have tested their CD-ROM/DVD on different computers to make certain that it functions properly. When the teacher receives the final version to mark, the marks must be awarded on the contents of the candidate's CD-ROM/DVD, not from files on a server or memory stick. The teacher and moderator must assess exactly the same product.

Candidates must be warned to keep the documentation within the 2000 word limit. Project documentation is only awarded marks on the documentation up to the word limit of 2000 words. Teachers should be vigilant, as moderators are, of attempts by candidates to circumvent the word limit by including extended text in tables or incorporating it into diagrams. These words will be included in the word count and candidates will effectively self-penalise themselves as the 2000 words will be reached before all criteria are moderated, depriving the candidates of marks in Criterion F and possibly Criterion E.

It is recommended that the following sources of information regarding the requirements for the ITGS Project be consulted and made available to candidates:

- *ITGS Guide* (pages 56-72)
- *Forms.zip*
- *Guidance on the appropriateness and complexity of an IT solution for the project*

Teachers need to be familiar with the following additional information regarding the ITGS Project and engage in additional professional development regarding the ITGS Project wherever possible.

- *Teacher Support material* (information and 6 exemplars)
- OCC ITGS Project FAQs
- ITGS Subject Reports from the May 2012, Nov 2012, May 2013 and Nov 2013

sessions

- *IB Academic Honesty* document
- *Handbook for Procedures for the Diploma Programme (updated yearly)*
- Relevant information for ITGS published in the *Coordinator Notes* (published quarterly on the OCC)
- ITGS online workshop (Category 1 & Category 2) or ITGS face-to-face workshop (Categories 1, 2 & 3)

Higher level and standard level paper one

Higher level Paper 1 and Standard Level Paper 1 are separate components. However, many of the comments that apply to one component apply to the other.

In this session, there were three questions that were common to both papers. They were as follows:

HL Q1 and SL Q1 – Analysis of external examination grades by an international school

HL Q2 and SL Q3 – Online Training

HL Q3 and SL Q5 – Energy efficient data centres

The comments for these questions are included within the HL Paper 1, Section A information.

Higher level paper one

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 7	8 - 14	15 - 23	24 - 31	32 - 39	40 - 47	48 - 80

The areas of the programme and examination that appeared difficult for the candidates

Many candidates demonstrated difficulties to correctly and appropriately respond the Sections B and C of the exam, which deal with topics 3.10 IT systems in organizations and 3.11 Robotics, artificial intelligence and expert systems. Many students seemed to have no clear understanding of a Project Initiation Document, the responsibilities of an Information System Manager or PRINCE 2.

Many candidates do not understand what an expert system is and how it works. It is common to find students who confuse the behaviour of an expert system with that of a robot. Few students demonstrated knowledge about the purpose of an expert system shell and fewer yet were able to correctly construct inference rules that were put into the expert system by a knowledge engineer to solve a given problem.

The areas of the programme and examination in which candidates appeared well prepared

Most candidates were better prepared to answer questions on the Section A of HL Paper 1 which included the topics common to SL Paper 1. These included the characteristics of a

secure site, differences in the uses of spreadsheets and databases, differences between lossless and lossy compression and differences between downloading and streaming video.

With reference to Section B IT systems and organizations, most candidates seemed to have a reasonable knowledge about the major differences between direct changeover and phased changeover. In Section C Robotics, artificial intelligence and expert systems, most candidates had a very good idea about the meaning of the term “artificial intelligence”.

The strengths and weaknesses of the candidates in the treatment of individual questions

Common question: HL question 1 and SL question 1

(a) Most candidates were able to

- Identify at least one characteristic of a CSV file (1ai).
- Identify at least one reason why the examination board would provide files in CSV format (1aii).
- Identify at least one characteristic of a “secure site” (1aiii).

Most candidates were able to achieve partial marks in parts b and c

(b) Most candidates presented a few advantages and/or disadvantages of spreadsheets and databases for the scenario indicated in this question and were able to achieve 3 or 4 marks. Rarely, however, the answer had enough depth to get the student 5 or 6 marks.

The development of extended responses (“c” types) was usually in the “adequate” level descriptor (3-4 marks).

(c) The discussion about the implications of one examination board selling the data it holds about the schools to another company usually touched only the most obvious points (privacy issues, cost, security), but ignored other equally important implications, such as the possibility of comparing its results with those of other boards, a more in-depth analysis could be provided to the schools and parents, universities and other institutions could use this information to evaluate their prospective candidates, etc. Also, it is disappointing how many candidates make generic references to “hacking” as a response to almost any question.

Common question: HL question 2 and SL question3

(a) Most candidates were able to:

- Correctly calculate the file size into KB, but were unable to calculate the length of time it took to download the video (HL 2ai, SL 3ai).
- Correctly outline the difference between lossless and lossy compression (HL 2aii, SL 3aii).

- Correctly outline the difference between downloading and streaming videos (HL 2aiii, SL 3aiii).

(b) Most candidates misunderstood the question. They compared online education with face-to-face education rather than comparing "online evaluation tasks" with "face-to-face evaluation tasks". Evaluation tasks were not even mentioned in a large number of responses. Too many of the responses were not focused on the scenario and generic responses that could apply to any situation were provided.

(c) Most candidates again misunderstood the question. They went deeper into the comparison between downloading and streaming, which was already asked (HL 2aiii, SL 3aiii), instead of evaluating the decision to download the videos and use them to train the staff in the Andes. Those who did evaluate the decision did not provide sufficient depth into the topic and covered only superficial implications. The achievement here was usually basic (1-2 marks) or at most adequate (3-4 marks).

Common question: HL question 3 and SL question 5

(a) Most candidates were able to:

- Correctly answer the question; however, an alarming number of candidates did not know the correct definition of terabyte (HL 3ai, SL 5ai).

- Identify at least two features/characteristics of data centres that make them consume large amounts of energy. The question asked for three features (HL 3aii, SL 5aii).

- Identify at least one way that data redundancy may occur in data centres; however, an alarming number of candidates demonstrated that they did not know the meaning of *redundancy* (HL 3aiii, SL 5aiii).

(b) Many candidates properly analysed the impact and implications for the data centres in case the government decided to charge their environmental impact. Rarely, however, the answer had enough depth to get the student 5 or 6 marks. Many students misunderstood what was being asked and focused on addressing how good for the environment it would be such decision.

(c) Candidates in general addressed this question the same way as they did with HL 5c, which was about outsourcing. So, they were able to achieve some marks (usually 3-4), but at the same time they demonstrated no understanding of any difference between moving the data to an external data centre and outsourcing their IT provision. The answers in general ranged from superficial (basic) to adequate, but were rarely competent or proficient.

Section B

HL question 4

(a) A small percentage of candidates opted for answering question 4. Most of those who did ended up not achieving high marks in this question. Most of those candidates were able to:

- Achieve two or three marks (HL 4ai), usually because there were so many possible answers that they would eventually get some choices right. However, there were many candidates who erroneously included answers such as feasibility study, testing and/or implementation in their responses

- Achieve no more than 1 mark when attempting to identify three responsibilities of the Information Systems Manager (HL 4aii). Needless to say that it was clear the majority of the students had no idea what the Information System Manager does.

(b) Most of the answers provided were very generic and lacked depth. Most students could not demonstrate they understood what is a project methodology such as PRINCE2. The answers were usually focused on vague terms such as “lack of planning”. The majority of students did not achieve more than 2 marks.

(c) Unfortunately most responses were usually short and very superficial. Instead of evaluating to what extent a project manager’s technical knowledge is critical to the success of the projects they manage, most students presented a list of reasons why a project manager should have technical knowledge. The achievement here was usually basic (1-2 marks) or at most adequate (3-4 marks).

HL question 5

Between questions 4 and 5, most candidates opted for answering question 5.

(a) Most candidates were able to:

- Identify at least two acceptable reasons why the Top Dog owners decided that it was time to replace their old information system (HL 5ai); many candidates, however, came up with vague answers such as “the system is outdated.”

- Identify at least two tasks that might need to be performed during the implementation of the new information system (HL 5aii).

(b) Many candidates demonstrated a very reasonable knowledge of the differences between direct changeover and phased changeover for the implementation of the new information system. The analysis provided was usually awarded between 4 and 6 marks in most cases.

(c) Most candidates were able to provide adequate or competent answers and reasonably evaluate to what extent it would be advantageous for Top Dog Veterinary Practice to

outsource its information system to a cloud computing provider. They usually demonstrated good knowledge about the pros and cons of such solution.

Section C

HL question 6

A small percentage of candidates opted for answering question 6. Most of those who did not achieve high marks in this question.

(a) Most of those candidates were able to:

- Identify at least one characteristics of an expert system (6ai).
- Identify at least one reason why a doctor would use an expert system in order to help diagnose a patient's condition in (HL 6aii).

However, most candidates had no idea about the relationship between a knowledge base and a knowledge engineer (HL 6aiii)

(b) This question was problematic. Most candidates did not understand the purpose of an expert system shell (HL 6bi).

Most of the answers provided were incorrect (HL 6bii), because in many cases the the inference rules were out of order or altogether wrong. In other cases candidates did not read the question with sufficient care and used the symbols > (or <) instead of ≥ (or ≤).

(c) Candidates tended to provide short and very superficial responses. Instead of evaluating whether Dr James should trust the results produced by an expert system in making her final decision about a course of treatment for a patient, most students presented a list of reasons. The achievement here was usually at a basic level (1-2 marks) or at most adequate (3-4 marks).

HL question 7

In Section C, most candidates opted for answering question 7.

(a) Most candidates could provide an acceptable definition of artificial intelligence (HL 7**ai).** They were not able to properly answer question (HL 7**aii)**. The question asked for steps that could be taken by a drone to identify a target. Most students included actions taken by the human operator and/or steps that had nothing to do with "identifying" a target, such as shooting.

(b) Most candidates provided a number of reasons whether it was acceptable or not to train soldiers using a battlefield computer. Their analysis allowed them usually achieve 4 to 5 marks.

(c) Candidates did not write well-supported arguments in order achieve a reasonable number of marks in part **c**. The responses were usually off course. Instead of evaluating to what extent it is acceptable in war that robots should be able to make their own decisions, many

students provided a discussion whether or not robots have artificial intelligence. Other students came with science fiction ideas and arguments based on movies such as I-Robot. The achievement here was usually basic (1-2 marks) or at most adequate (3-4 marks).

Standard level paper one

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 5	6 - 10	11 - 17	18 - 24	25 - 30	31 - 37	38 - 60

The areas of the programme and examination that appeared difficult for the candidates

In general, it seemed candidates did not:

- Apply their knowledge to the new situations and provide responses relating to the specific scenario.
- Use appropriate ITGS terminology and phrases (i.e. IT specific terminology or terminology relating to social and/or ethical considerations.
- Provide appropriate examples to support their arguments.
- Organize their responses as required in some part b questions and part c questions.
- Provide arguments in a logical sequence leading to a conclusion in part c questions.
- Understand the relationship between the number of marks, the command term used and the time to allocate to the question.

The areas of the programme and examination in which candidates appeared well prepared

Three questions on SL P1 were most frequently selected:

- SL Q2 Hospital network
- SL Q3 Indonesia makes progress on its ambitious biometric national identity card project
- SL Q4 Blog Energy efficient data centres

SL Q1 that involve spreadsheets and databases and SL Q5 focused on data centres were selected much less frequently.

Databases and spreadsheets have appeared on a number of past examinations. There are still too many examples of where students do not understand database and spreadsheet concepts and related terminology.

The strengths and weaknesses of the candidates in the treatment of individual questions

For an explanation of common questions on HL Paper 1 and SL Paper 1, see explanations under HL Paper 1. These questions include:

- HL Q1 and SL Q1 – Analysis of external examination grades by an international school
- HL Q2 and SL Q3 – Online training
- HL Q3 and SL Q5 – Energy efficient data centres

SL question 2 Hospital network

(a) Most candidates were able to identify one characteristic of a WAN, but not two for 2 marks (SL 2ai). There was some confusion between WAN and wireless networks. Generally, the candidates understood two ways data about patients could be entered into wireless tablets (SL 2aii). The purpose of switches is not well understood (SL 2aiii).

(b) Most candidates reached the middle range of marks (3-4 marks) on this question. Even though candidates may understand what is a WAN, they could not explain where the problems from linking 25 hospitals in the city with a WAN could emerge.

(c) Most candidates who attempted the question understood RFID-based tracking. However, responses often lacked examples, detailed knowledge, balance and conclusions/judgments which limited the marks to the 3-4 markband.

SL question 4 Indonesia makes progress on its ambitious biometric national identity card project

(a) Many candidates did not describe how the person's record in the database could be found from specific information on the electronic credit card (SL 4ai). Candidates were able to achieve 3-4 marks for identifying steps that are used by biometric software to identify a person from the photograph of the face (SL 4aii).

(b) Some candidates went off-course in this question because they did not specifically address all three issues: privacy, anonymity and security. Many candidates were not ablr to distinguish between these terms. Others did not provide a policy and explanation for each as required by the question.

(c) Most candidates did not provide sufficient detail and balance in their response. Candidates did not fully discuss whether the Indonesian government should continue with the implementation of the national identity card scheme. They should be able to place themselves

in the role of the stakeholder and apply their ITGS knowledge to the biometric identity card scenario. Most often marks fell within the 3-4 markband.

Recommendations for the teaching of future candidates for higher level paper 1 and standard level paper 1

- The teaching of ITGS has to be balanced in the different areas of the syllabus in order to properly cover the ITGS triangle - there cannot be an emphasis in just one area. All areas must be covered and students must learn to develop their answers in depth with well-supported arguments.

- More emphasis needs to be placed on organizing the responses on questions that use markbands before beginning to write. Markbands are used in some part b questions, for example analyse, compare, explain why (but not explain two …) and all part c questions. To reach the higher level descriptors depth is required rather than breadth. A list is unlikely to achieve more than 2 marks.

- Discussions about up to date ITGS topics, using news articles from reliable sources, must be frequently carried out in class. Candidates need to develop their abilities to analyze new situations, provide supported arguments and evaluate the impacts and implications of information technology in different scenarios. Also students should note words and phrases that may be helpful in writing future responses.

- Teaching command terms is essential for success - way too many candidates respond to the questions with very superficial answers, especially in part c. Candidates need to be given the opportunity to practice timed questions and mock tests. It is important that candidates are given detailed feedback about their responses to the command terms so their possibility of success will greatly increase.

- Candidates need to have an organized approach to studying the entire ITGS Guide so that they have sufficient material and notes to review before taking the ITGS examinations. Consideration needs to be given at the onset of an ITGS course on how class notes and outcomes of discussions will be recorded for later reference.

Higher and standard level paper two

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 2	3 - 5	6 - 8	9 - 11	12 - 15	16 - 18	19 - 26

General comments

The online shopping article for this paper was based on a situation that would have been often discussed in class. It would have been familiar to most candidates as in real life they or other members of the family would have shopped online. Therefore it could be expected that the standard of the responses would be better than in previous sessions. Disappointingly this was not the case; there was only a very small improvement. This indicates that more work is needed in developing an understanding of the application of the higher-order thinking skills required by the command term, 'evaluate', that is used in Criterion C and Criterion D.

The areas of the programme and examination which appeared difficult for the candidates

It was pleasing to see that there was continuing evidence that candidates had learnt how to write structured responses to Criterion C and Criterion D, but there were still a significant number who had not planned these responses. Furthermore most had not returned to Criterion A and Criterion B and revised their work after they had analysed the article in detail in Criterion C and Criterion D as there were weaknesses still appearing in responses for Questions 1(a) and 2(b) that effectively capped the mark for the paper.

A continuing problem is that many candidates still do not know how to write a conclusion for Criterion C and Criterion D. If a conclusion was presented, in many cases they were just a summary of the previous material or an unsubstantiated comment 'dropped' into the text. This prevented some good candidates from achieving the highest marks. Any conclusions need to be overarching **statements** that add value to the response and are supported by the information provided in the analysis.

The strengths and weaknesses of the candidates in the treatment of individual questions

Criterion A

Part A:

Most candidates were able to identify a social/ethical concern but surprisingly many did not describe the details of the concern even though they were later described in Criterion C; hence the need to return this question after completing Criterion C. There needed to be an explicit description for the stakeholder (e.g. shopper/online business/traditional store) of the

actual impact /result /consequences /effect/ outcome. The markscheme will provide examples.

Part B:

Most candidates correctly identified a stakeholder but not all were able to describe the relationship of the stakeholders with the IT system. The response needs to identify the stakeholder, what the stakeholder is using the IT system for and most importantly the exact part of the IT system that is being used. Too often 'IT system' was used instead of naming the component. The markscheme makes this distinction clear.

Criterion B

Part A:

There were only two major components required for this question as specified in the stem of the question: the use of the phone, and the use of the online databases. Most could describe steps required in the use of both in the context of buying or reviewing a product online, and the link between them. However, in order to gain the higher marks the candidates needed to demonstrate that they possessed knowledge beyond that contained in the article. The type of knowledge required is clearly set out in the markscheme.

Part B:

Again this was a poorly done question as s did not **identify** and then **explain** the major weakness that contributed to the overall concern. Candidates need to stop and think carefully about their response as it requires an analysis of the concern linked to the IT system and its use. Candidates needed to explain the link between two items, how the concern could come about and why it could happen due to a weakness in the IT system and its use. The weakness needs to be written using specific IT and ITGS terminology. However the weakness does not need to be an IT weakness but can be about policies and other aspects of the use of the IT system. Again the markscheme shows this clearly.

Criterion C

As in other examination sessions a significant number of candidates raised many issues and implied there would be positive or negative impacts but did not provide details. The question asks for the impact of the issues on the various stakeholders. It seems that candidates are learning about issues in the classroom but more needs to be done investigating the real impacts on the stakeholders in their lives.

It was clear that most s knew that a structure was required for the response and provided one based on the various stakeholders or the various issues. The most successful were those based on the stakeholders as it enabled them to provide a **balanced** set of positive and negative impacts which is required for the higher marks.

Also the better candidates were able to point out links between the impacts for a stakeholder and also between the impacts on various stakeholders. As well they were able to point out implications of the impacts in terms of size, the future, possible other effects, impacts on other

stakeholder, duration, extent, etc. Previous reports have contained more details and examples about how to make the analytical links and to highlight the implications of the impacts that go beyond simply describing them.

Criterion D

Most candidates were able to identify a solution to one of the problems found in Criterion C, however too often for this session there was not a detailed description presented. Furthermore, if one was provided it was no more than a generic description of how the solution worked but was not linked to context of the article. The best way to provide the link is to apply the solution to a specified stakeholder and his/her problem. To enable an effective evaluation of the solution candidates need to provide a **balanced** analysis consisting of at least two positive and two negative comments about the effectiveness of the solution in solving the problem.

Again it needs to be emphasised that a second different solution will not be marked; the question clearly states only one solution is required. However if a solution is multi-faceted, as often happens with a security solution, the various parts much clearly be solving aspects of the same problem but in a different way.

Recommendations and guidance for the teaching of future candidates

- As has been mentioned above the markscheme for this session clearly sets out the type of required knowledge for the responses to Criterion A and B. Candidates and teachers need to become familiar with this structure and use it in class when analysing news articles and writing responses to previous examination papers.

- When teaching for Paper 2 using previous examination papers, analysing candidate responses or using a news article (the original or adapted) the most benefit will be gained if a structured method is used to analyse it and to write the response. Information about these can be found on the IB Online Curriculum Centre in the ITGS forum and ITGSopedia.

Higher level paper three

Component grade boundaries

Grade:	1	2	3	4	5	6	7
Mark range:	0 - 4	5 - 8	9 - 13	14 - 16	17 - 19	20 - 22	23 - 30

The areas of the programme and examination that appeared difficult for the candidates

As with previous case studies, students still have difficulty in linking in independent research. The research must be different to that of the case study contents but also have a related link. Without this independent research, students cannot reach the top tier of the grading rubric. Some of the attempts at linking independent research included phrases like “BBC says….” or “when I did a survey…..” without any specific details as to the actual research.

Being a Higher Level component of the subject, students are expected to demonstrate higher order skills, such as analysis, synthesis and evaluation. Many students could only identify and describe, but not take the response to the next level with some form of analysis and conclusions that go beyond unsubstantiated statements. Many of the responses would have benefited from taking a short time to spent planning before beginning writing. The examination was increased by 16 minutes in 2012 to enable this to occur. This lack of planning was demonstrated by some of the responses starting well then going off on a tangent to the original goal of the question. By spending time on planning, students can create a skeletal framework of key ideas that they can use as a scaffold for their response.

The levels of knowledge, understanding and skills demonstrated

The Cobb Publishing case study had some stronger results than previous years. Students appeared to have had some evidence of researching real life situations of epublishing and ebooks. The understandings of the underlying and core concepts of intellectual property and some of the technical issues of synchronisation and sharing showed that student had been exposed to what the case study had required.

What was interesting this year was that there appeared to be a link with student success with those who chose to link their Internal Assessment project and the case study. Those students who focussed their project on a publishing or ebook idea seemed to develop more of an understanding of the ideas behind epublishing and had good links to the Paper 3 questions.

In general, this year, while students still struggled with developing evidence of independent research, students linked the case study better within their responses. They used, referenced, linked and connected the ideas of Cobb Publishing directly into their responses. In the past, many of the Question 4 responses were so generic they could have been responses for any case study. This session, there were few generic responses and many linked directly to the case study.

The strengths and weaknesses of the candidates in the treatment of individual questions

Question 1

(a) Most candidates were successful with this question. Unless they totally misunderstood the question, they tended to reach full marks.

As with previous years, some candidates waste time by over analysing the answer and providing too much information; in some cases negating their answer with incorrect information. I think this comes from a lack of understanding about the command terms. The size of the text box in the answer booklet gives a clear indication of the length of the response expected.

Some candidates provided more than 2 responses hoping that the scattershot approach will work.

(b) There was a little confusion with this question. Many candidates confused the features of the ebook with the ereader; using the features interchangeably.

Some responses were too vague and did not differentiate themselves enough from a standard printed book. For example, simply saying that an ebook can be highlighted was not sufficient as a printed book can also be highlighted.

Question 2

This was a wide range of marks for this question. The majority of candidates successfully identified the majority of the processes needed to ensure accurate and successful synchronisation. Most candidates anticipated that this was a more technical question and answered accordingly.

One downside of the responses for this question was that candidates referred to 'the cloud' and did not expand on the processes that were happening to have files uploaded to it. Statements like "Files are sent to the cloud to be synced'. There was nothing regarding accounts, internet connectivity requirements etc.

There was a small proportion of candidates who misunderstood the question and spoke more about the benefits of why synchronisation instead of the actual process of synchronisation.

Question 3

The vast majority of candidates knew the difference between active and passive DRM methods. However many used the basic information provided within the question and did not delve further into the issues both create.

Some candidates did not discuss the benefits and issues for both Cobb Publishing and/or the readers. Instead, they focussed too much on active and passive methods of DRM.

Some responses to the active method of DRM not allowing copying of files missed the point that active was in fact trying to avoid intellectual property from being lost. Those responses merely focused on the fact that they were not able to get the book for free to give to their friends.

Question 4

While it was mentioned earlier that there was evidence of relevant independent research, once again there were very few candidates who actually demonstrated this. Without relevant independent research that is explicitly signposted, candidates are not able to reach the 9-12 markband.

As mentioned earlier, there were some attempts at independent research. “The BBC says that…..” However, there needs to be specific evidence of research to support the arguments being made.

There were some candidates who were confused by the question and misunderstood the focus of the question. The question was asking students to focus on Cobb Publishing developing an in-house programme for creating ebooks containing multimedia and interactivity etc. However some students saw the words multimedia and interactivity and chose to talk solely about that and as a consequence were unable to access the upper level descriptors of the markbands.

It was good to see some candidates show arguments as to why Cobb Publishing should NOT develop the in-house programme instead of taking the positive path in their response.

Candidates were also distracted by self publishing and having this as the main focus in Question 4 instead of using it as a component. This was only part of the case study and not even mentioned in the question itself.

It appeared, and more than in the past, that candidates may have run out of time as a larger than normal proportion of student responses to this question were shorter than expected. Usually, these candidates were the ones who had longer than required responses to Questions 2 and 3. It is recommended that candidates plan their time as well as their response to ensure that they have adequate time to complete Question 4 effectively.

Many candidates struggled with developing coherent analyses and substantiated conclusions resulting in largely descriptive responses.

Recommendations and guidance for the teaching of future candidates

- Command Terms – There needs to be a time spent during the course on how to interpret and understand the requirements of the specific command terms. Candidates are missing out on valuable marks as they are not reaching the level for which the command term requires or in other cases writing far more than is necessary. The OCC and ITGSopedia have a number of examples and resources on this topic.

- Evaluating – Discuss with candidates effective strategies and/or frameworks such as using a triangle (advantages, disadvantages and my opinion) to enable them to develop a response that has an evaluation. This should enable them to access the higher level descriptors.

- Time management – Candidates should take some time, particularly for Questions 3 and 4, to plan out the key points in the response using a framework such as the one suggested above. They also need to ensure sufficient time is left to complete Question 4 as it accounts for 30% of the total marks of the paper. Candidates will need to be shown strategies for doing this as well as practising it for themselves.

- Independent Research – Candidates should be provided with as many opportunities as possible to undertake independent research. This should include gathering primary data (if possible or appropriate), using collaboration with others within their class or other schools as well as developing effective searching strategies that go beyond looking in Wikipedia. Candidates should also be guided in how to incorporate it into their responses.

- Interpreting the question - Discuss with candidates strategies for interpreting the requirements of the questions such as by breaking down the stem of the question into smaller more manageable chunks, underlining key words, jotting initial thoughts and building in thinking time. This will hopefully prevent candidates going ‘off course’. Also re-reading the question while writing the extended response to ensure if the response still relates to the question asked.