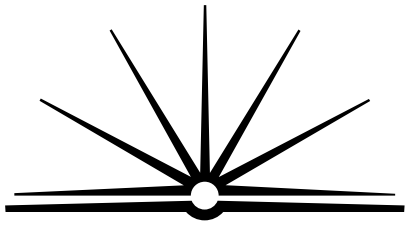

BOARD OF STUDIES
NEW SOUTH WALES

1997 HSC

EXAMINATION REPORT

Design and Technology

Including:

- **Marking criteria**
- **Sample responses**
- **Examiners' comments**

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1997
HIGHER SCHOOL CERTIFICATE
EXAMINATION

DESIGN AND TECHNOLOGY

ENHANCED EXAMINATION REPORT

Contents

DESIGN AND TECHNOLOGY

CANDIDATURE

2/3 Unit (Common) — 4653

3 Unit (Additional) — 529

NATURE OF COURSE

COURSE DESCRIPTION

SYLLABUS

2/3 Unit Design and Technology approved by the Board of Studies in 1992 for implementation in 1993 and initial examination in 1994. Amended in 1993 for the purpose of Pathways, and implemented in 1994 for initial examination in 1995.

The Design and Technology syllabus includes a Preliminary 2/3 Unit (Common) course, an HSC 2/3 Unit (Common) course and a 3 Unit (Additional) course.

The 2/3 Unit (Common) course involves a related study, a comparative case study, design projects and a major design project.

The 3 Unit (Additional) course involves a core and a specialised study.

AIMS

This syllabus focuses on the study of technology and its applications through design in domestic, community, industrial and commercial settings in rural and/or urban environments.

It provides opportunities for candidates to:

- become enterprising, creative and adaptable;
- develop the ability to design in response to human needs and wants;
- develop attitudes and skills that will empower them to initiate and respond to change;
- develop confidence and competence in the management and use of materials, tools and techniques;
- develop thinking and practical skills, and apply theoretical concepts to the realisation of practical solutions;
- develop an understanding of a range of technological activities and their applications in a variety of enterprises;

- develop a critical awareness and appreciation of the impact of current and emerging design and technology on the quality of life;
- develop environmental and social responsibility in design, the use of technology and resource management.

COURSE CONTENT

Preliminary 2/3 Unit (Common) Course

The Preliminary 2/3 Unit (Common) course includes the related study, the investigative component of the comparative case study, design projects and a proposal for the major design project.

The Preliminary course is considered to be assumed knowledge for the HSC course.

HSC 2/3 Unit (Common) Course

The related study is addressed in the HSC course through the comparative case study and the major design project. It involves content acquired in various ways. It deals with designing and producing, using resources, management, communication, marketing, issues relating to organisations as well as social, environmental and other aspects of design and production. Learning experiences extend from school-based activities into the world beyond school.

The comparative case study is made up of two components. The first component involves an investigation of two organisations, and is carried out in the Preliminary course. The second component involves the comparison of the two organisations, and is carried out in the HSC course.

The major design project is a design project that is submitted for the Higher School Certificate examination. A proposal for a major design project is developed in the Preliminary 2/3 Unit (Common) course. The major design project is completed in the HSC 2/3 Unit (Common) course.

LENGTH OF COURSE

120 (indicative) hours of school study.

HSC EXAMINATION FORMAT

- One written paper of 1.5 hours in duration.
- The major design project, which includes the realisation of a product, a system or an environment and the documentation of all aspects of the development of the project.

COURSE CONTENT

3 Unit (Additional) course

The 3 Unit (Additional) course includes a core and a specialised study.

In the core, candidates will investigate design and technology through a critical analysis of:

- innovation in design and technology;
- success of innovation in design and technology;
- entrepreneurial activity in design and technology.

The specialised study includes both the research and development of a concept related to the 2/3 Unit (Common) major design project and the documentation of all steps involved in the process.

The specialised study will result in the development of ONE of the following options:

- an innovative application
- a new or improved resource
- a manufacturing system
- a marketing strategy.

The written documentation of the specialised study is submitted for the HSC examination.

LENGTH OF COURSE

As for the 2/3 Unit course, plus 60 (indicative) hours of school study.

HSC EXAMINATION FORMAT

- One written paper of one hour in duration.
- A specialised study that documents the research and development of an aspect of the 2/3 Unit (Common) major design project.

PROCEDURES AND GUIDELINES FOR HSC MARKING

Please note: The criteria for marking are set out in the *Technological and Applied Studies Stage 6 KLA Handbook*, which is referred to at various points in this text. This document supersedes *HSC Subject Manual No 6*, which was actually in use when marking of the 1997 candidature was carried out.

2/3 Unit (Common) Examination

The 2/3 Unit (Common) examination consists of TWO parts:

Part I – Written Paper (40 marks)

Time allowed: 1.5 hours (plus 5 minutes' reading time)

The written paper is divided into THREE parts:

Section I (10 marks)

- In Section I, there are TEN multiple-choice questions.
- All questions are compulsory.
- All questions are of equal value.
- All questions are answered on the answer sheet provided.

Section II (15 marks)

- In Section II, there is ONE structured short free-response question.
- The question is compulsory.
- The question is based on the comparative case study and related study.
- The question is answered in the space provided in the examination paper.

Section III (15 marks)

- Section III consists of THREE structured extended free-response questions.
- Candidates attempt ONE question of the three.
- All three questions are of equal value.
- Each question is based on the related study and the major design project.
- The question is answered in a separate writing booklet.

In Section I, the multiple-choice questions 1–10 in the 2/3 Unit (Common) paper are machine marked.

The examination committee presents a set of answers for the supervisor of marking to consider. A selection of senior markers and markers confirm the best answer for each question. The answers are then sent by the supervisor of marking to the Examination Production and Information section of the Board of Studies in order for candidates' responses to be computer marked.

Candidates' responses, and the most correct answers, follow in this report.

In order to mark Section II and Section III of the 2/3 Unit (Common) written paper, HSC markers develop accepted responses and marking scales for each question. This is achieved through a process of discussion and pilot marking. The marking scales are developed to include all aspects of the question and provide for a full range of marks, from zero to full marks. Checklists are developed for each question so as to address each aspect of the question. This assists markers to award marks fairly and consistently.

The marking schemes are contained in this report.

The free-response questions in the 2/3 Unit (Common) and 3 Unit (Additional) written papers are double marked. The second marker is unaware of the first mark. All questions are marked out of 20 and then scaled by computer to the final mark per question. If the discrepancy between the first and second mark is 6 or greater out of 20, it is marked a third time.

Each marker keeps a tally of the marks he/she awards. These marker tallies are statistically examined each day and are used as a check, along with check-marking by the senior markers, to ensure accuracy of marking and a full ranking of candidates.

Part II – Major Design Project (60 marks)

Each candidate undertakes, on an individual basis, a major design project for submission for the HSC. The major design project includes the submission of:

- a product or a system or an environment;
- a folio documenting the project proposal, project management, project development and realisation, and project evaluation related to the designing and production of the product, system or environment.

The major design project is marked itinerantly. HSC markers travel to the school or centre to which the project has been submitted. In cases where it is essential that the project requires viewing or operation in situ, markers will travel to the candidate's home or a location at which the project has been set up for marking.

During late Term 3, pilot marking and HSC marking of each candidate's major design project takes place. Pilot marking occurs over two nights and two days. Each HSC major design project marker is trained to mark all types of projects according to the marking criteria as set out in the *TAS Stage 6 KLA Handbook*. Regardless of expertise or background, each marker is trained to mark the full range of projects and technologies presented, by applying the criteria as set out in the *TAS Stage 6 KLA Handbook*.

Prior to pilot marking the senior markers mark the projects at the pilot marking centre and develop benchmarks for each of the projects used to train markers. When pilot marking, each marking team (of two markers) marks four to five projects each session and discusses marks as a team and with senior markers. Each marker is supplied with a checklist derived from the marking criteria set out in the *TAS Stage 6 KLA Handbook* to assist in ensuring that each candidate covers the criteria for the major design project.

The checklist used to assist the markers is contained in this report.

Each marker is continually check-marked by senior markers and adjusts his/her marking until the whole group of markers is consistent in its approach and awarding of marks.

Each marker pilot-marks and discusses approximately 25 projects before arriving at the first centre/school for marking. During the course of marking, each team is check-marked a minimum of four more times by senior markers to ensure uniformity in marking.

Markers are trained to mark, and apply the marking criteria to, any project presented. Evidence from the last three years of pilot marking and HSC marking has shown that markers from a practical background can be trained to mark according to the criteria and be very accurate and consistent.

Candidates' major design projects are double marked, with frequent check-marking by senior markers. To maintain uniformity and consistency, the allowable discrepancy is much tighter than that set for the written paper. If the mark difference between the first and second mark of the marking team is 7 or greater out of 60 for the candidate's project, markers discuss and mark again. If the discrepancy cannot be resolved, a senior marker is contacted for a third mark to be completed.

3 Unit (Additional) Examination

The examination consists of TWO parts:

Part I – Written Paper (20 marks)

Time allowed: 1 hour (plus 5 minutes' reading time)

The written paper consists of TWO sections:

Section I (12 marks)

- There is ONE compulsory extended free-response question, drawn from the core.
- The question may involve candidate response to stimulus material.
- The question is to be answered in a separate writing booklet.

Section II (8 marks)

- There are THREE structured short free-response questions.
- Candidates attempt ONE of the three questions only.
- All questions are of equal value.
- The questions are based on the core.
- The question is answered in a separate writing booklet.

As with the 2/3 Unit free-response questions, the HSC markers develop accepted responses and marking scales for each 3 Unit question. All candidates' responses are double marked. The second marker is unaware of the first mark. All questions are marked out of 20 and then scaled by computer to the final mark per question. If the discrepancy between the first and second mark is 6 or greater out of 20, it is marked a third time.

Part II – Specialised Study (30 marks)

The specialised study is sent to the Board of Studies and is marked in November, at the same time as the written paper.

Marking is kept precisely to the marking criteria as set out in the *TAS Stage 6 KLA Handbook*.

Each report is marked by two teams of two markers. Each marker from the first team marks individually. The team then arrives at a common mark. The second team, unaware of the first team's mark, goes through the same process. If its mark differs from the first by more than 6 out of 30, it is considered discrepant and requires a third mark, by a third marking team.

When markers consider a study to be excessive in length it is given to a senior marker, who carries out an accurate word count. The supporting materials — 2/3 Unit major design project folio extracts, maps, charts, drawings, computer printouts, and video or audio tapes — are not included in any word count. Only words relating to the study itself are counted. If the study is substantially over 2000 words, it is brought to the attention of the supervisor of marking, who evaluates which section of the study is excessive in length and considers how much the candidate is advantaged by the excessive length. In discussion with senior markers and assistant supervisors of marking, the supervisor of marking makes an adjustment accordingly. Every case is viewed individually.

Less than 5% of specialised studies were considered to be excessive in length in the 1997 HSC. However, many of these studies were as long as 5000 words. It was considered by markers, senior markers and the supervisor of marking that candidates who exceeded the word limit were advantaging themselves over a candidate who had abided by the rules in the *HSC Subject Manual No 6* and kept to the word limit.

It is reiterated that candidates must keep to the word limit of 2000 words.

Clerical Procedures for HSC Written Paper Marking

All candidates' scripts are kept in bundles according to each examination centre. Strict confidentiality is maintained at all times. Scripts are distributed to, and collected from, markers by the senior markers only. Senior markers ensure that a marker does not receive papers from his/her own school. It is not permitted for markers to find out the names of the schools from which they have received scripts.

Markers do not record any marks on the scripts. They complete the mark on the marksheet that accompanies each bundle of scripts. After the first mark, the marksheet is removed and a second blank marksheet is put on the bundle ready for the second mark. Both first and second marks are completed independently.

2/3 UNIT (COMMON) EXAMINATION

Section I (10 marks)

QUESTION 1 **80%** of candidates correctly chose **C**

For a product to be ecologically sustainable, all environmental issues must be considered.

QUESTION 2 **44%** of candidates correctly chose **D**

Technical drawings communicate details of the product, system or environment.

QUESTION 3 **50%** of candidates correctly chose **B**

The goal of Total Quality Management is to continually improve goods and services.

QUESTION 4 **22%** of candidates correctly chose **A**

Adherence to regulations takes into account issues of safety, strength and durability.

QUESTION 5 **77%** of candidates correctly chose **C**

A professional designer takes *responsibility* for the design of products, systems or environments.

QUESTION 6 **47%** of candidates correctly chose **A**

To ensure occupational health and safety in the workplace, one should avoid and design away hazards, organise work practices and provide protective equipment and training.

QUESTION 7 **78%** of candidates correctly chose **B**

Market research identifies the need and opportunity within a target market.

QUESTION 8 **67%** of candidates correctly chose **C**

A ‘design brief’ considers all aspects in the design of a product, system or environment to meet a specific need.

QUESTION 9 **41%** of candidates correctly chose **B**

The total cost of a product or system is made up of a proportion of the full running costs of the enterprise, plus the materials and direct labour.

QUESTION 10 **66%** of candidates correctly chose **D**

The chart showed that the same *proportion* of females and males between 17 and 24 years of age use this product.

General Comment

Multiple-choice questions require careful reading and reflection before an answer is given. Candidates are reminded that they are to ‘select the alternative A, B, C or D that *best* answers the question’. Candidates need to select the best of all answers that are possibly correct when deciding between A, B, C or D.

Section II (15 marks)

QUESTION 11

This question was compulsory.

The question was to be answered in the spaces provided in the examination paper.

In Question 11 the marking scale provided for up to 20 marks to be awarded. This figure was converted to a final mark out of 15.

Suggested Answers and Marking Scale

Name TWO organisations with contrasting structures. State the products and/or services that each organisation provides.

Organisation 1

These responses do not attract marks but are used to validate answers later in the question.

Name (eg T.J.Designs)

Products and/or services (eg Graphic design layouts)

Organisation 2

Name (eg Melville Furniture)

Products and/or services (eg Household furniture)

(a) (i) For each organisation, describe a design issue or problem that you or the organisation identified. Use a different example for *each* organisation.

Responses could include quality control, environmental issues, plant layout, workers' conditions etc.

Organisation 1

1/2 mark — any issue or problem stated.

0, 1/2 or 1 mark — for description of the issue or problem.

Organisation 2

1/2 mark — any issue or problem stated.

0, 1/2 or 1 mark — for description of the issue or problem.

(ii) Explain how each organisation has dealt with its issue or problem, or alternatively how you would resolve them.

Responses could include factory layout changed, dust extraction installed, noise insulation carried out etc.

0 or 1 mark — for each organisation, for stating how the issue or problem has been dealt with.

(iii) Compare the management structure of each organisation and analyse how this impacted or could impact on the resolution of each issue or problem identified in part (i).

Responses could include:

- Flat, hierarchical, sole trader, partnership etc for management structures.
- Comparison could include number of employees, methods of communication, types of management levels, large v small etc.
- Decision-making processes to resolve issues could include, for example: in a small company the owner makes all decisions as he/she is solely responsible for the running of the business; in a large organisation the OH&S committee makes a decision and refers it to management, who delegate responsibility to resolve the problem.

1/2 mark — management structure for Organisation 1.

1/2 mark — management structure for Organisation 2.

1 mark — for comparison of the management structures.

1 mark — how the decision-making process was carried out in Organisation 1.

1 mark — how the decision-making process was carried out in Organisation 2.

(b) (i) For each organisation, state and describe ONE technology utilised. Select a different technology for each organisation.

Responses could include industrial sewing machine, cash register, automated materials handling, fax machine, computer etc and then a description, eg cash register used to collect money and control stock.

Organisation 1, Technology 1

1/2 mark — for stating a specific technology.

1/2 mark — for description of the technology.

Organisation 2, Technology 2

1/2 mark — for stating a specific technology.

1/2 mark — for description of the technology.

(ii) Evaluate the effectiveness of each technology described in part (i).

Responses could include increased production through the use of faster machines, decreased noise and pollutants through quieter and newer machines.

0, 1/2 or 1 mark — for each technology, depending on the evaluation.

(c) For ONE of the organisations you have studied:

Name of Organisation (eg T.J.Designs)

(i) Comment on the social impact this organisation has had on the local community.

Responses could include encouragement of local children through sponsorship of sporting teams, increased employment of local people, provision of a stimulus for the local economy by goods and services produced.

1 mark — for comment on social impact, positive or negative.

1 mark — for relating to the local community.

(ii) Describe how local environment issues related to this organisation have been managed.

Responses could include: pollution issues affected local streets — solved by employing people to regularly pick up rubbish; development of local wetlands threatened bird life — an Environmental Impact Survey was carried out.

1 mark — describing a local environment issue.

1 mark — describing how the issue was managed.

(iii) Critically analyse the way in which a major resource has been used by this organisation.

A response might name water as the resource: the water was used to wash and clean sand and gravel; the water was recycled, tested and cleaned to minimise usage, waste and pollutants.

1 mark — for identifying the major resource.

1 mark — how or why resource has been used.

1 mark — effects of using the resource (critical analysis).

Markers' Comments

Most candidates were able to identify two organisations and state the goods/services provided. It was evident later in the question that a few candidates did not choose organisations with sufficiently contrasting structures to adequately respond to some parts of the question.

(a) (i) This part was well answered with most candidates able to identify a design issue or problem associated with each organisation. Some candidates chose similar or identical issues, which caused problems when answering later questions.

A typical good response was:

... had the problem that due to size the production process was disorganised resulting in errors and defects in product.

A typical poor answer did not describe the issue:

... too much noise.

(ii) This part was very well answered, either in terms of how the organisation solved the issue or how the candidate proposed to solve the issue.

A typical good response was:

... solve the problem of insufficient emergency evacuation by installing more emergency doors and standards approved exit signs.

A typical poor answer did not relate to the problem or issue in (a) (i) or was very general:

... fixed the dust problem so it didn't cause a problem.

(iii) This part proved to be demanding, with few candidates able to fully answer all components of the question.

A typical good response was:

... structure of ... was hierarchical and the structure of ... was a sole trader. ... had 150 employees in 12 divisions with sectional managers where ... employed only 3 people. The problems at ... were solved by decisions of the board of directors and passed to supervisors and at ... the boss made all the decisions.

A typical average response:

... had a flat structure and ... a hierarchical structure. They employed different number of people and problems were solved very well.

A typical poor response:

Both organisations had similar structures ...

(b) (i) Most candidates were able to identify a technology associated with each organisation. A few candidates were very general and were not able to specifically name the process or equipment chosen.

A typical good response was:

Global Positioning System. This was used for navigation and safety reasons.

A typical poor response used the same technology for each organisation and simply said:

... big fast machinery ... .

(ii) This question produced many good responses, with students understanding the effect of technology on the organisations nominated.

A typical good response was:

The effectiveness of the train system at ... is that it is relatively cheap to move material about the site and very reliable.

(c) (i) This part was reasonably well done; however, a few candidates were unaware of local issues or did not understand what social impact meant.

A typical good answer was:

... the tours and safaris had itineraries which included aboriginal settlements. The indigenous people took advantage to display crafts and sell to the tourists ... provided money to locals.

A typical poor response was:

... made sure that everything was looked after and money provided.

(ii) Most candidates were able to answer this well. Some candidates simply stated a method of fixing pollution.

A typical good response was:

... the local tip was being filled too quickly ... the waste paper was recycled and sold to city suppliers.

A typical poor response was:

... the fumes were filtered before being released to the outside.

(iii) This section proved to be a challenge to most candidates. Many were unable to fulfil the expectation to 'critically analyse' the use of the resource.

A typical good response was:

... the employees are the major resource. They spend millions of dollars each year on the training and multi-skilling of all employees. This gives the company a competitive edge and also gives greater efficiency and productivity.

Question 11 Checksheet

Date:																				
																				Table No
Centre No																				
Candidate No																				
Issue																				
Description (0, 1/2, 1)																				
Issue																				
Description (0, 1/2, 1)																				
Explain (0 or 1)																				
Explain (0 or 1)																				
Structure																				
Structure																				
Comparison (0 or 1)																				
Decision process (0 or 1)																				
Decision process (0 or 1)																				
State																				
Description																				
State																				
Description																				
Effectiveness (0, 1/2, or 1)																				
Effectiveness (0, 1/2, or 1)																				
Social impact (0 or 1)																				
Relation loc com (0 or 1)																				
Environ issue (0 or 1)																				
How managed (0 or 1)																				
Resource (0 or 1)																				
How/why? (0 or 1)																				
Analysis (0 or 1)																				
Total /20																				

No half marks in TOTAL

Section III (15 marks)

All questions were of equal value. Candidates were to answer ONE whole question from questions 12, 13 OR 14.

Candidates answered the question in one or more separate writing booklets.

The questions were initially marked out of 20, which was converted to a final mark out of 15.

QUESTION 12

Suggested Answers and Marking Scale

You are a product developer and you have been given the following design brief:

Design and produce an item of protective headgear suitable for a child between the ages of five and twelve years.

(a) List and discuss the main design issues and constraints you need to consider before you start designing. (5 marks)

In responding to this question, there were many issues and constraints that candidates could have discussed. Markers identified safety (to protect when playing sport, from sun exposure or in the event of an accident), size (to fit a variety of different-sized heads) and market appeal (aimed at the target market) as being essential. These were awarded one mark each. Other issues that were discussed — such as durability, shape, comfort, weight, cost, function, materials and strength — scored one mark for two and two marks for four. Marks were halved if the issues were listed without any discussion.

(b) Sketch your initial design idea and clearly label the design features. (4 marks)

Candidates were allocated one mark for a sketch that (a) was considered recognisable and (b) contained some elements of detail. A further mark was given for every three features labelled, to a maximum of nine features.

(c) Explain FIVE features that address the issues and constraints you listed in part (a). (5 marks)

In answering this question, it was considered important for candidates to recognise the distinction between a feature and an issue with reference to part (a). An example of a feature might be ventilation holes. The issue this is attempting to address is that of the need for comfort to the wearer. To gain a mark for any of the five features requested, candidates needed to identify a feature and then explain how this addressed one of the issues they gave in part (a).

(d) Compare the effects your major design project and your headgear design could have on the individual, society and the environment. (6 marks)

To gain full marks for this section, candidates were required to identify how both their major design project as well as their headgear design affected (a) an individual, (b) society and (c) the environment. Since candidates were not required to name their major design project, any effect that related to the individual, society or the environment scored a mark. Responses relating to the headgear design needed to be more specific. These could have been (a) (on the individual) a saving from injury; (b) (on society) a reduction in the community health bill; (c) (on the environment) the negative effects due to the use of non-recyclable, non-renewable materials.

General Comments by Markers

In general, this question was well answered. This required markers to set a marking scale that was fairly specific and to load marks into the more difficult parts in order to discriminate between students.

In part (a), many students listed the issues without discussing them. Many also lost marks because they failed to think beyond the issues of safety and comfort.

Most candidates were able to score a full mark for their sketch in part (b), indicating a high ability of students to communicate graphically. Many, however, lost marks for failing to label at least nine features.

Candidates lost marks in part (c) through their inability to distinguish between a 'feature' and an 'issue'. Many also failed to address issues that they had identified in part (a).

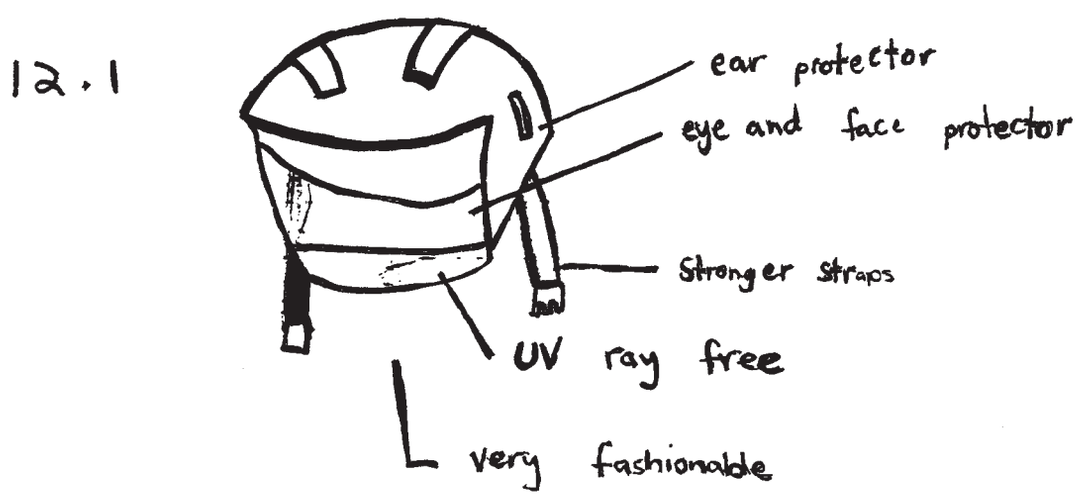
Part (d) was the most difficult for candidates, many failing to address the effects that their major design project had on the individual, society and the environment.

Example of a Poor Response

(a) Children's headgear is just not suitable for bike riding. It is compulsory to always wear headgear and it is also illegal to not use one. Children today want something that is fashionable and very comfortable and fits their small heads. I wonder if a headgear has ever been made to adjust and fit all over another problem that has been discovered is children's ears and sides of faces also get cut and grassed.

Normal headgear, has a 'phomey' inside and soft straps and not so strong clips, also there is a very thick layer of plastic around the helmet which is not very safe. This style is very unfashionable and not as safe as people want it to be from the age 9 to 12 children have softer heads. The style I'm looking for is very safe and environmental. I also want to make it biodegradable. It will be a bit heavier than normal head gear and very strong.

(b) Headpiece 2000



(c) Ventilation holes introduced in the headgear to stop the kid from overheating. Sun visor attached to keep sun off kid's face to minimise skin cancer.

(d) A major problem today is too many children get run over or hit down by cars. My headgear design would stop people in society getting hurt. Another issue is the environment. Our ozone layer is getting worse every single day, the head piece 2000 are hand made and will not effect the environment one bit.

Markers' Comments

This response was worth 4–6 marks.

(a) The candidate alluded to the issues of safety with regard to cycling and mentioned fashion, comfort, fit, weight and environmental concerns without discussing these issues.

(b) The sketch represented the minimum for an acceptable response. The features given were vague and only one mark could be credited to them.

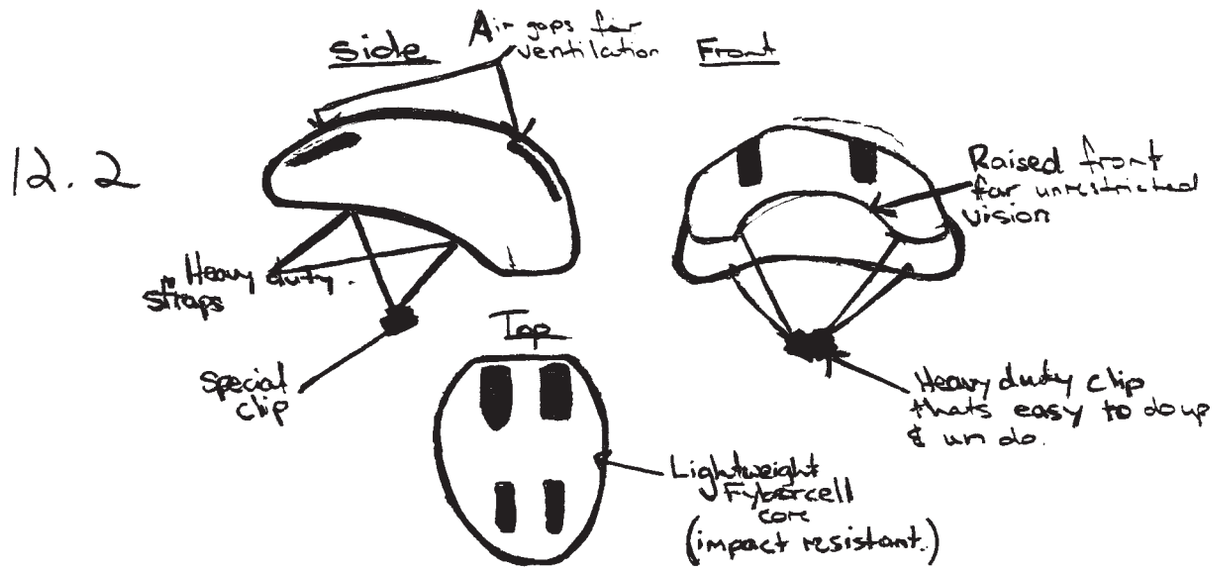
(c) Since 'comfort' was listed in (a), 'ventilation' was considered a feature that addressed this issue. The 'sun visor' could not be counted since the issue of UV protection was not mentioned in (a).

(d) As with this whole response, the candidate failed to understand and address the question, scoring marks only for the reference made to the effect on society.

Example of an Average Response

(a) Firstly I must find out what the headgear is going to be used for, like cycling and activities alike. Second find out the guidelines already set out for a product like this, find the range of sizes needed for kids 5–12 and the most suitable materials. For this to be successful it must be light, fit properly, mustn't restrict the user in anyway and must be durable enough to sustain heavy knocks. Once I have found and gathered all this information, I can begin to think of a design that will work and that people will buy.

(b)



(c) The special lightweight core is probably the biggest feature it is superlight weight but it is impact resistant. Unlike other cores, it won't crack or split under heavy pressure or strong knocks. It has been shaped to one of the most comfortable head shapes yet and has 4 areas designed to let air in to keep the head cool. One of the constraints was vision, the gear could not hinder the user in anyway, like it sliding down over the users eyes. So to overcome that I moved the back straps further back along the gear to stop it from slipping. Size was another constraint as kids from the ages 5 to 12 are growing rapidly, parents won't want to be buying their kids new helmets every 12 months, so I put in a soft foam that will adjust to a child's growing needs for at least 2 years. Another constraint was the cost of design and manufacture. This was overcome by looking at older methods of designs and making and simply using all of my information to make the best, easiest and smartest way to make the helmet.

(d) The effects my major design project could have on the individual is probably increased performance, a feeling of confidence and safety and a higher self image as the helmets look really good and all your friends would be jealous. The effects on society wouldn't really occur as it's not a huge thing but it would probably give it an added boost of safety and feeling of well being as parents could feel safe knowing their children are. The effect on the environment would probably be very little if anything as this headgear can last for quite a long time and can be re-used over and over again. The only problem is that the materials are not bio-degradable but apart from that I don't think that this design would have a major impact on the environment.

Markers' Comments

This response was worth 9–11 marks.

(a) The candidate correctly identified the need for a range of different-sized helmets. The issues of purpose, materials, weight and durability were also mentioned without any related discussion, so they could only score half marks.

(b) The sketch was adequate, with five labelled features.

(c) Three features addressed the issues that the candidate had given in (a). These were contained in the references to size, weight and strength. The candidate failed to gain credit for the remainder of the features given since these did not relate to any of the issues listed in (a).

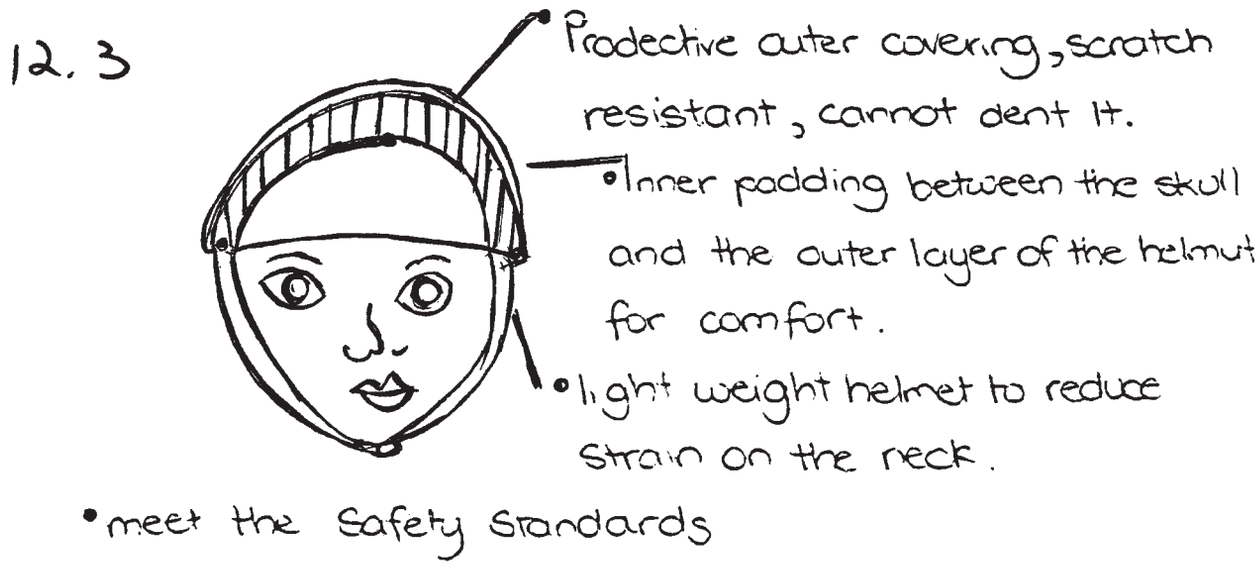
(d) The candidate failed to satisfactorily address the major design project. However, there were adequate responses relating to the headgear design for its effect on the individual, society and the environment.

Example of an Excellent Response

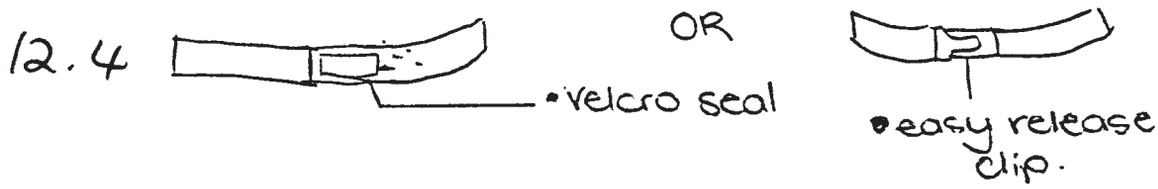
(a) There are a number of parameters which must be considered when designing for protective safety equipment. The first major issue is that of safety standards. Does it meet the standards of the Australian Government? The second is, does it provide support? Young children are still growing and needs neck support. Another is that children are still growing so the product will only be used for a reasonably short time, and then a larger helmet will be needed. Children between the ages of 4–15 have the highest rates of accident and injury in Australia. So the headgear must be extremely hard wearing and durable for a young child, their skills are still developing so they should have a clip or

release on the headgear which could be easily used. The headgear must also be light by being light, ergonomic so the child will want to wear it. If the helmet is also aesthetically pleasing to the child eg famous cartoon character, then they may want to war it. Children like to ride during the day and it is at 12:30 – 2:30 that the sun is at its hottest, so sun protection is needed as Australia has the highest rate of skin cancer in the world.

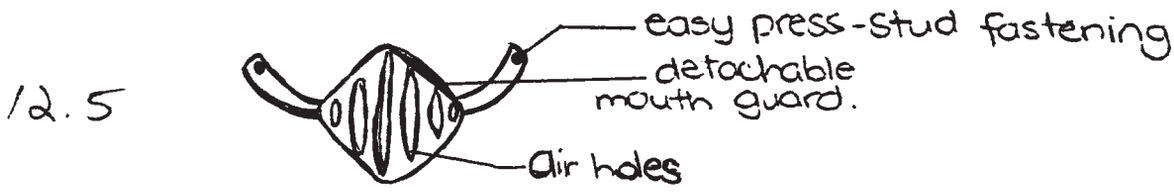
(b) Front view of helmet:



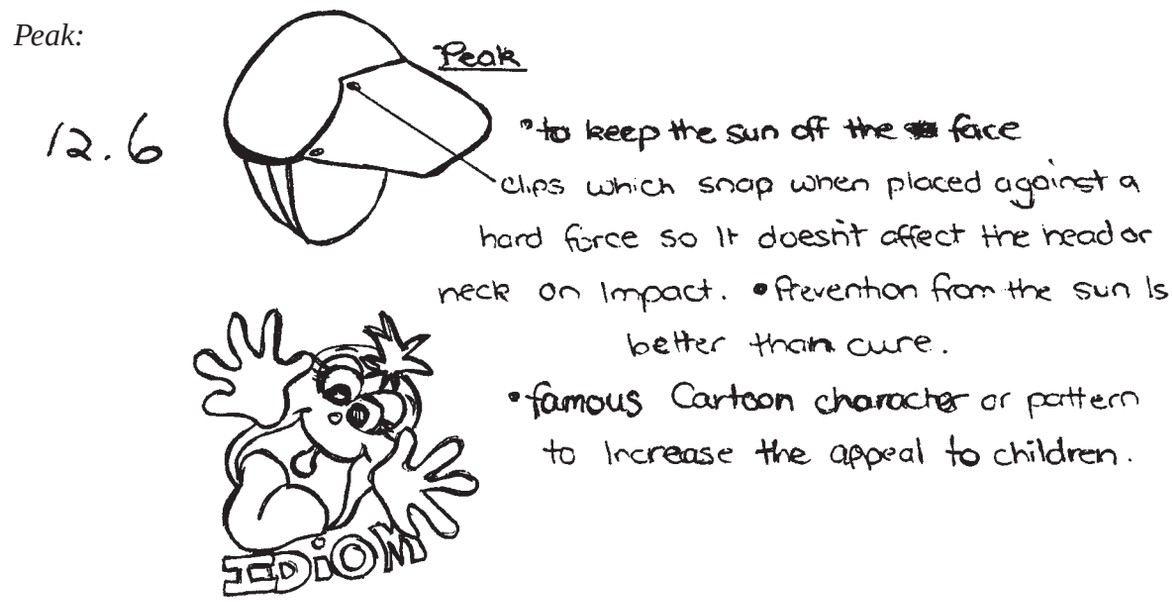
Fastenings:



Mouth Guard:



Peak:



(c) The first is sun protection, the helmet is designed with a wide brim peak. This will keep the sun off the child's face. The peak also serves as a safety feature as the clips which hold it on break on impact to prevent any strain placed on the spine or head of the child. Another feature is the mouthguard. As children are growing their bodies are developing, the mouth guard prevents a child from harming their mouths or teeth. The lightweight inner foam and outer coating will be used to place no unnecessary strain on the neck and spine. The foam also supplies an ergonomically sound comfort for the child as well as an acting shock absorber. The fifth is an easy to use fastening which involves the use of a velcro strap or easy release clip. This will prevent children from wearing a helmet which is too tight or allows them to take it off easier. The thick outer coating also acts as a durable aesthetically pleasing cover which is scratch resistant therefore prolonging the life cycle of it.

(d) My major design project is a lightweight one person tent. This has the positive social and environmental consequence of promoting increased interest and awareness in the environment and nature. There is also a benefit in that by using the product for bushwalking, cross-country skiing, etc, people would be undertaking exercise and increasing their level of fitness which would help both the individual and society by promoting better health amongst the community.

The effects the helmet will have on the individual include reduced sun exposure, which can lead to a reduced risk of skin cancer. The mouth guard can reduce injury to mouth and teeth. The hard outer covering can prevent external or internal damage to the skull. The effects the headgear could have on society include a decrease in the number of mortalities regarding bicycle accidents. A decrease in the number of skin cancer victims and a decrease in the number of children with injuries from preventable accidents every year. The effect on the environment would be the added burden on landfill once the helmet had outlived its use and required disposal.

Markers' Comments

This response was worth 19–20 marks.

(a) The candidate clearly identified and discussed the three issues that were considered essential by the markers, namely safety (with reference to Australian Standards and sun protection), size (to fit a range of head sizes) and market appeal (to children). In addition, a further four issues were given (durability, comfort, weight and ease of use), enabling maximum marks to be given to this section.

(b) The sketches were recognisable and with sufficient detail. In addition, at least nine features, the minimum number required for full marks, had been identified on the sketches.

(c) In addressing the issues given in (a), the following features were explained:

FEATURE	ISSUE
Wide-brim peak	Safety
Mouthguard	Safety
Lightweight inner foam	Weight
Velcro strap	Ease of use
Thick outer plastic coating	Durability

(d) In identifying the effects that her/his major design project and headgear design could have on the individual, society and the environment, the candidate's responses can be summarised in the following way:

MAJOR DESIGN PROJECT	
Effects on the individual	Increased personal fitness
Effects on society	Improved community health
Effects on the environment	Increased awareness of the environment

HEADGEAR DESIGN	
Effects on the individual	Reduced risk of personal injury
Effects on society	Decreased cycling fatalities
Effects on the environment	Increased non-recyclable waste

Question 12 Checksheet

Table No	
Date	
Page No	

Centre No														
Candidate No														
(a)	*Safety listed & discussed	1												
	*Size appropriate to 5–12 yr olds listed & discussed	1												
	*Market appeal to 5–12 yr olds listed & discussed	1												
	*Other issues listed & discussed 2=1; 4=2	2												
(b)	Recognisable sketch with detail	1												
	Labelled features: 3=1; 6=2; 9=3; no half marks	3												
(c)		1												
		1												
	Explanation of 5 features. Must address issues in (a)	1												
		1												
		1												
(d)	OWN PROJECT Effects on individual	1												
	OWN PROJECT Effects on society	1												
	OWN PROJECT Effects on environment	1												
	HEADGEAR DESIGN Effects on individual	1												
	HEADGEAR DESIGN Effects on society	1												
	HEADGEAR DESIGN Effects on environment	1												
	TOTAL Half marks – round down	20												

*Half marks for list only

QUESTION 13

Consider the 'Quit-For-Life' illustration below and answer the following questions.

® The Quit logo is a registered trademark of the Anti-Cancer Council of Victoria.

Suggested Answers and Marking Scale

(a) Identify and analyse the characteristics of the target market.	**5 marks**
Target market is smokers because of the word 'Quit' and the drawing of the cigarette.	1 mark
Characteristics of the target market:	1 mark per characteristic (max 3)
• male and female — not gender-specific wording	1 mark for each analysis (max 2)
• all intellects — simple, easy-to-read message written in large print	
• all NESB cultures — cigarette symbol interpreted by non-readers	
• all ages — strong visual impact of the bold print.	
(b) Describe your major design project and your target market.	**6 marks**
Identify your project.	1 mark
Describe your project.	2 marks max
State the target market for your major design project.	1 mark
Describe your target market.	2 marks max

(c) Design an advertisement to promote your major design project.	**5 marks**
Sketch the ad or describe it in words.	3 marks
Present a slogan or 'enticement'.	1 mark
Explain how the ad attracts the target market, eg bright colours, size of writing, placement of the ad in a magazine or in TV viewing time.	1 mark
(d) The above advertisement and the advertisement you designed in part (c) are both means of communication.	**4 marks**
Analyse and discuss the criteria that could be used to evaluate the success of both of these advertisements in communicating to their target markets.	
Criteria to evaluate the success of the 'Quit' ad: • less people smoking/change in behaviour • decrease in profits/downturn in cigarette sales • more people aware that you shouldn't smoke.	2 marks max
Criteria to evaluate the success of candidate's ad: • more people being aware of the product • increased sales etc.	2 marks max

Markers' Comments

(a) This question was generally well attempted, with most candidates being able to identify the target market and go on to indicate some of its characteristics. However, some difficulty occurred in analysing each of these characteristics. Some wrote about smoking in general and did not relate this to the 'Quit-For-Life' illustration.

Portions of some of the candidates' responses included:

… The target market is obviously smokers or those affected by cigarettes.

… The advertisement targets both young and old, male and female. It also targets those that have been smoking a long time and those that are thinking about taking up smoking.

… The 'Q' is written using the international symbol for 'Don't' with a cigarette sketched through it. This allows it to be easily recognised by people from other countries.

… The word has strong visual impact for people of all ages.

(b) This part was very well answered by the majority of candidates. A large percentage of the candidates could identify their major design project but some had difficulty in giving an adequate description of it. Most candidates were able to identify their target market reasonably well, but failed to properly describe that market. A percentage of candidates referred to the 'Quit-For-Life' illustration as their major design project, obviously misreading the question that was asked.

One candidate's response included:

… The product that I designed for my 2U major design consisted of a 7 × 4 foot trailer that was fitted out with a water tank at the front and a motor/pump at the back. [The response goes on to identify the design features of the trailer.] The Target market of the product is aimed at farmers (hobby or primary producers), contractors, council, nurseries, tree planters and anyone that has a need for water spraying or cartage of water.

(c) This was generally well answered, with most candidates providing a sketch and/or a description of an advertisement. The better candidates provided details that would attract their target market, including things such as slogans and enticements. Poorer candidates only provided a simple sketch with little evidence of the thought they put into the design of their advertisement. Again some students misread the question, electing to use the 'Quit-For-Life' theme for their advertisement.

Examples of some candidates' responses follow. They are reproduced in part only.

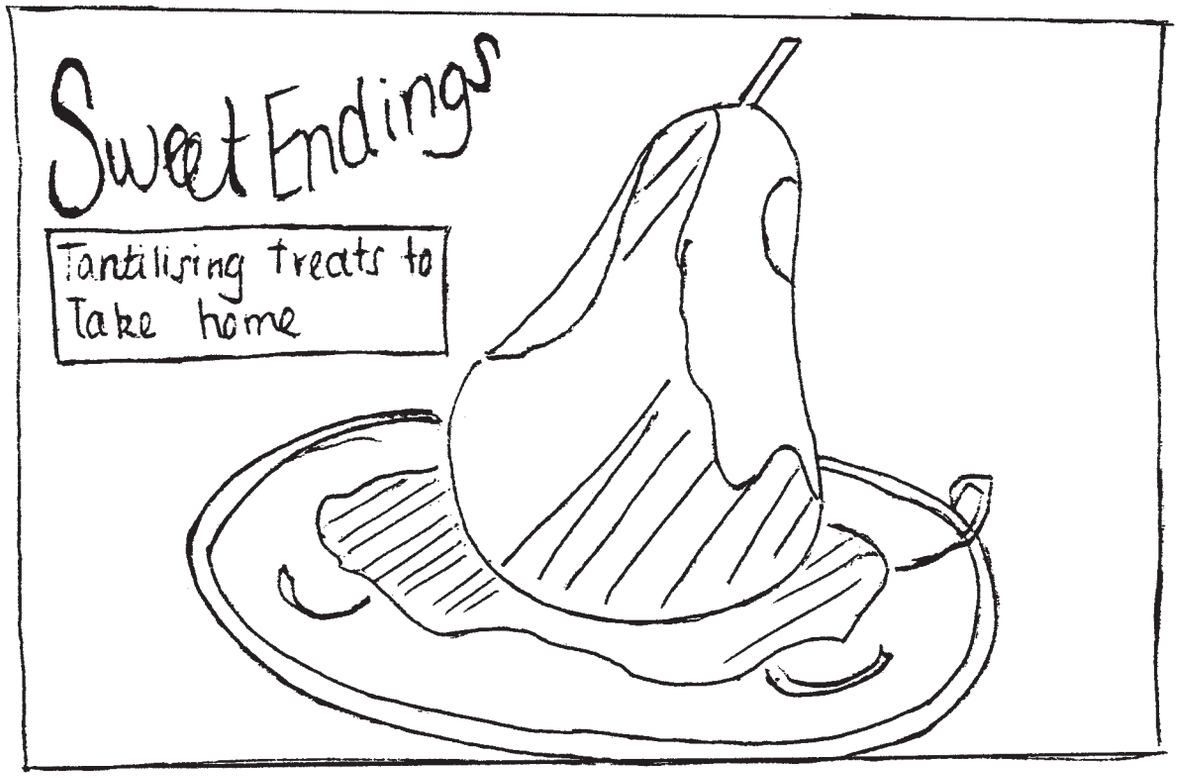
Example 1

Advertising is a form of marketing. I researched many forms of advertising for my shop:

'SWEET ENDINGS'

(Because I am a small business one of my restraints would include my budget. I would not have the money with my overhead costs etc.) for a large amount of advertising.

As a passive form of advertising, FREE POSTCARDS are selected by the consumer and therefore, reduce waste and are environmentally friendly. They make there way onto fridges at home, to the workplace and maybe even posted! Postcards (free ones) are in vogue. I collect them and I found an excellent article in the Qantas Club magazine in Jan '97 about free postcard businesses. As a result postcards were going to be my main form of advertisements. I have a logo but I have not designed a postcard before. It was part of my research.



V Front of Post Card.

^ Back of Post Card

SWEET ENDINGS
Tantilising Treats to Take Home

-Peached Pears'n Orange Lowfat Orange Sauce

ph. 1234-5678
21/22
Rangers Road Neutral Bay
ACN 000 013

POST CARDS FROM THE EDGE 1800 021 060

AFFIX STAMP HERE

Example 2

An advertisement that could promote my Major Design Project would be a television commercial.

Commercial Script:

Camera 1 (soft music playing in the background)

The camera zooms in on people on a boat having a good time, laughing and arriving in the Marina.

Camera 2 (change of music)

Focus is on the restaurant and night club where you see a lot of people entertaining, and people having a light lunch and coffee outside on the cafe.

Announcer starts to talk:

'Welcome to the Fantasies Restaurant and Nightclub, come in and enjoy a fantastic meal at our Fantasies Restaurant overlooking the magnificent marina, or escalate down stairs to our fully licensed Lobby and Bar where you can relax and unwind. Be sure to dance the night away at our Fantasea Nightclub.

So come to the Shell Cove Marina where Fantasea fulfils your food fetishes!!'

Camera 3 Zooms in on the people that come off the boat and have entered the restaurant and are receiving friendly service and everyone is happy and smiling and the children look happy and well.

(d) This was the most difficult part of the question, with many students failing to score well as they did not fully understand the question. Many students wrote about communication techniques but failed to tie this to the criteria that could be used in evaluating the success of the advertisement. Some students were able to answer the question in relation to the 'Quit' advertisement but failed to discuss their major design project. Some students continued to use the 'Quit' advertisement as their own major design project advertisement.

Portions of some of the candidates' responses included:

… undertake a questionnaire or survey of smokers to see if the advertisement has affected them personally.

… Compare the results of the number of people giving up smoking before the advertisement has been run, compared with after the ad has been run.

… Interviewing people about their feelings on the advertisement.

… Surveying how many people have noticed the advertisement.

… To find out how many people are interested in my major product.

… Survey to find out how many people have noticed my advertisement.

… Evaluating the results of a survey on the number of people who liked my advertisement and noticed my product.

… If my product was in production, to see if my sales increased after my advertisement had been published.

Question 13 Checksheet

Table Number: _____ Date: _____ Page Number: _____

(a) 5 marks			(b) 6 marks			(c) 5 marks			(d) 4 marks		Total	Cent	Cand
identify market	charact's	analysis	identify describe	target market	describe market	sketch	slogan	target market	quit ad	MDP ad			
1 mark	2/3 marks	2 marks	3 marks	1 mark	2 marks	3 marks	1 mark	1 mark	2 marks	2 marks			

QUESTION 14

Candidates were marked out of 20 according to the marking scheme devised in response to the question and arrived at as a result of pilot-marking a significant sample of candidate responses.

To ensure uniformity of marking, markers were asked to:

- skim read the candidate's response to determine an overall impression;
- compare the forms of the sketched responses;
- use the team-developed checksheet to examine candidates' responses and award appropriate marks.

The overall approach that was encouraged and monitored was to award, rather than deduct, marks. Markers were instructed to be receptive to a variety of presentations, varying from essay style to divided sections.

A ladder manufacturer wishes to extend its product range. The ladder currently available is shown below.

You are to design TWO ladders:

- **a ladder to be used by a tradesperson to reach a series of greater heights;**

AND

- **a ladder for use in a domestic kitchen.**

Respond to the following in relation to your designs.

(a) Sketch your design solutions.

(b) Describe how your designs will differ from the ladder shown in the above sketch.

(c) Indicate the key benefits and/or features of each of your design solutions.

(d) Describe the research techniques you used when developing your major design project.

(e) Show how the research techniques described in part (d) could be used to develop your new ladders.

Markers' Comments

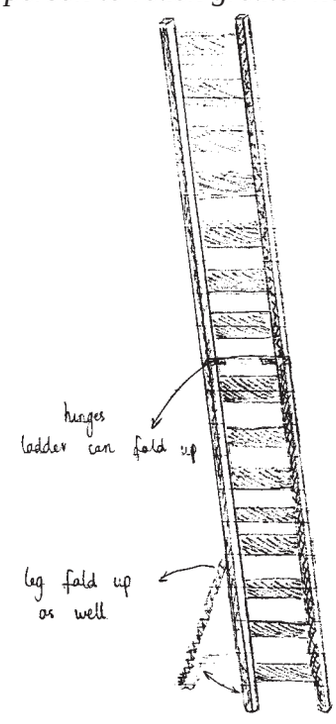
(a) This section was intended to elicit a 'drawn' response, requiring a degree of skill expected of a candidate who has completed two units of Design and Technology. This was coupled with the task of demonstrating the ability to design a specific article, work out problems and illustrate the result with or without accompanying notes.

Candidates' responses demonstrated a full range. Candidates who analysed the question devised an 'adjustable' ladder capable of operating at a number of heights, in the case of the tradesperson's ladder, and devised a ladder suitable for use in the domestic kitchen. It was important that candidates presented designs suitable for the intended use, ie a domestic ladder, capable of reaching in excess of 5 metres was not suitable, nor was a tradesperson's ladder limited to one or two heights.

Tradesperson's Ladder

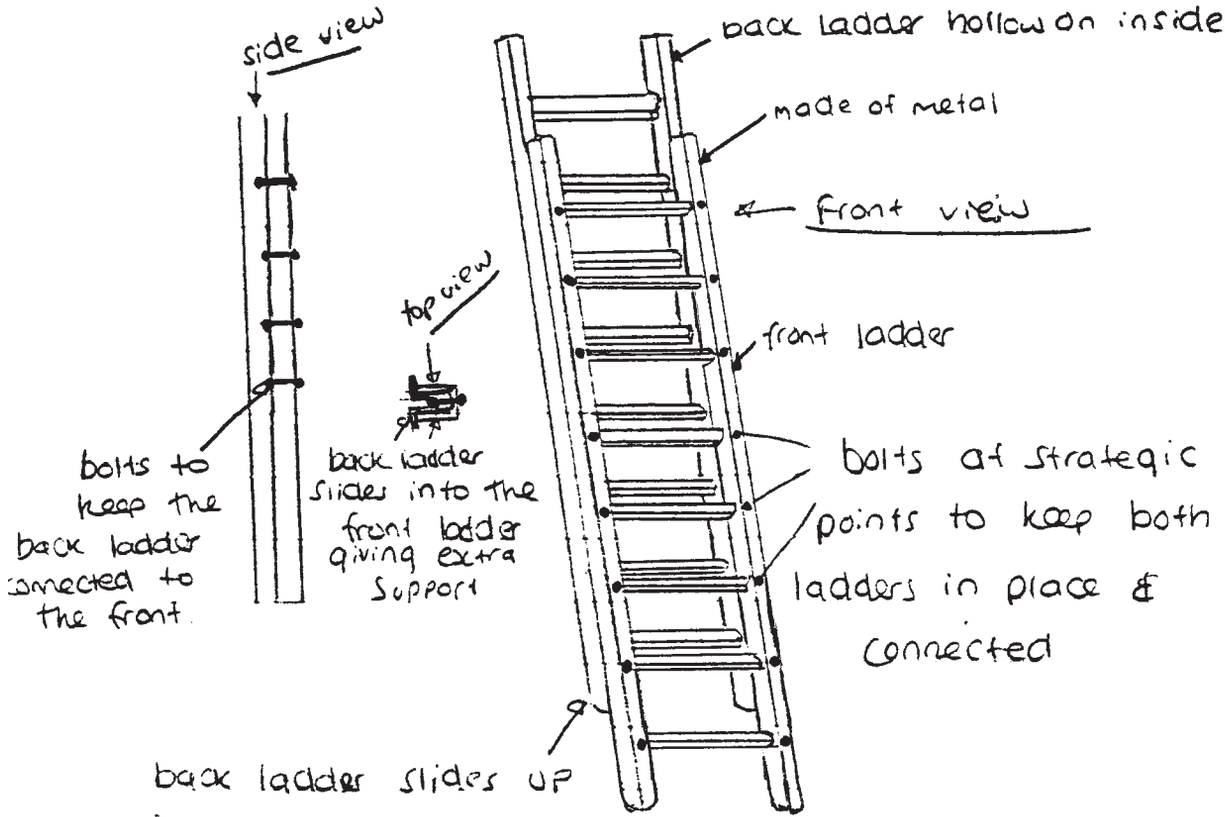
The following sketch illustrates a typical response. While the sketching skills are satisfactory, the drawing lacked detail, making it difficult for the examiner to interpret the drawing from the information given.

A ladder used by a tradesperson to reach greater heights.



This candidate analysed the question and better met the requirements. Good sketching skills are displayed along with appropriate, well-phrased notations.

ai. A ladder to be used by a tradesperson to reach a series of greater heights.

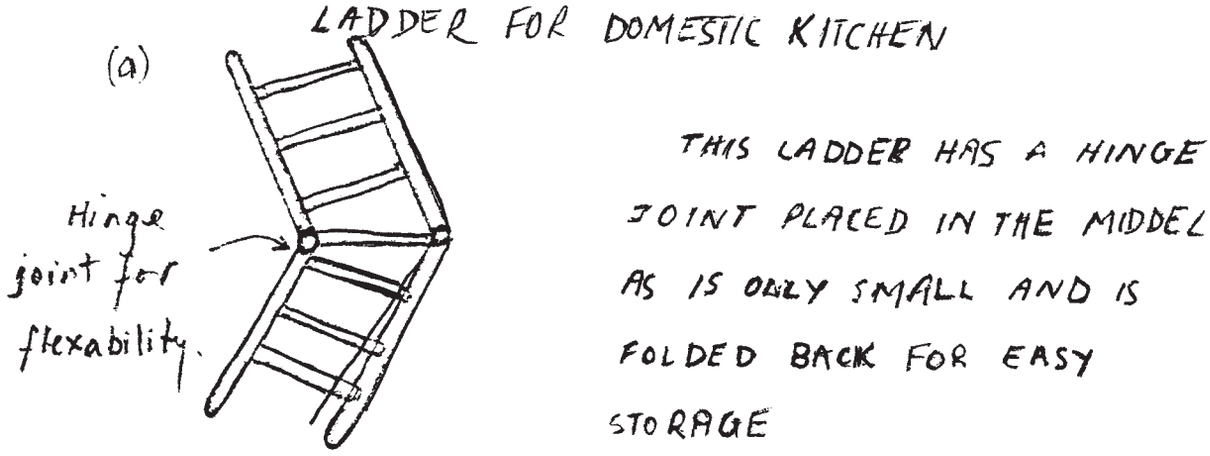


from behind the front ladder giving extra heights back ladder can slide up to as far as the last two bolts creating a varied height choice.

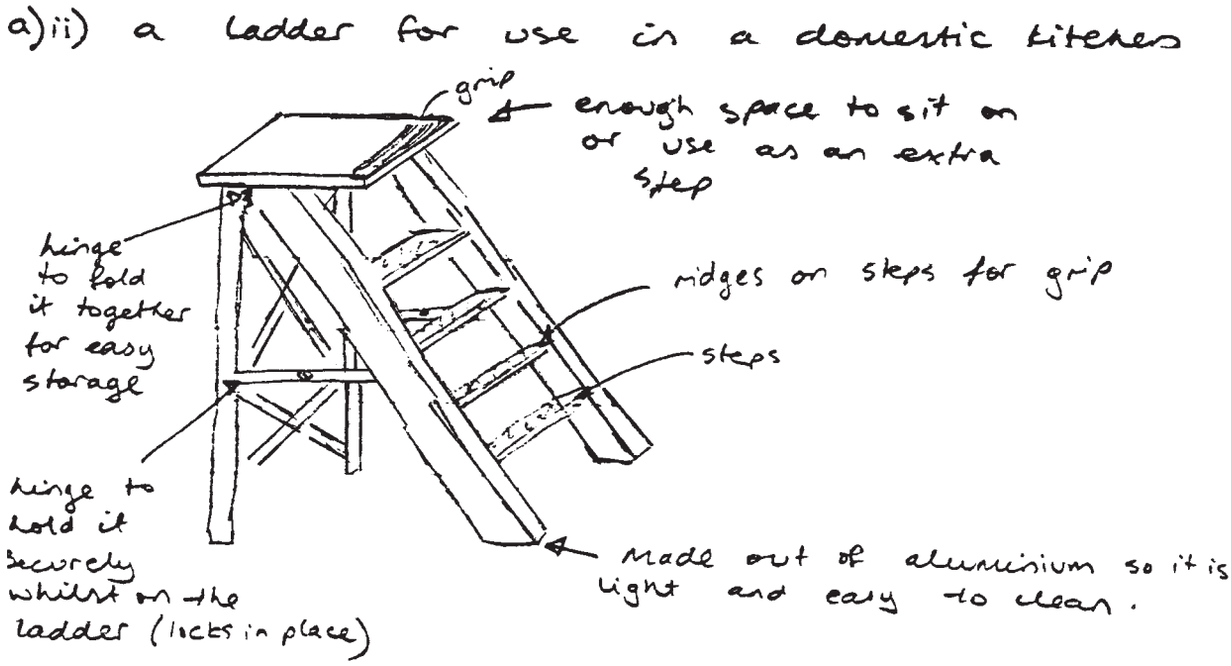
Domestic Kitchen Ladder

The prime focus of this question was for the candidate to develop a ladder suitable for use in a domestic kitchen. Features such as the ability to be stored and to stand free, flat steps and non-slip feet were common.

A below-average response might have omitted a 'stay' or support and not conveyed clearly a suitable/functional design.



A good response illustrated full operational aspects like a hinge and stay, with the added features of a large top, non-slip tread and steps, and indicated a choice of materials.



(b) This section was aimed to test candidates' ability to describe, in general terms, the differences between the ladder depicted in the question and their own design/s . Generally this section was answered well and few candidates responded with only single-word answers. An ideal response, shown below, gave at least two general differences for each type of ladder.

.... for the domestic ladder it would differ from the original ladder by having fewer steps, approximately two and have four legs so that it could stand on its own without having to lean against anything, and would be easier to keep inside.

The tradesmans ladder would be two lightweight ladders joined by clips so that the one on the back could slide up and down and slip into various positions and this would give the user control over what height it was extended to.

(c) This section allowed candidates to express the finer points of their design solutions. An explanation of up to three benefits/features was sought for each design, with the better quality answers giving a reasoned justification for the solutions offered.

An example of an appropriate response appears below.

The key benefits and features of my first design is that it provides several height choices and can be separated for singular use. The back ladder slides into the front ladder giving extra support. The metal pins help to keep the ladder in place when weight is placed on them. Another benefit is that it is metal, a strong substance that is resilient to breakage.

The key benefit and features of my second design include two ways to use it within the kitchen area. Either as a step to give height or as a flat ladder to be used to be placed against a flat surface giving height. Another feature/benefit is the rubber bottoms at the base of the ladders' legs to give extra stability on flat, slippery/shiny surfaces ie tiled area or wooden area. It is a small height to reach all kitchen areas and takes up minimal storage space.

An alternative style of response was presented in a table format.

Product	*Feature*	*Benefits*
The Tradespersons Ladder	*Flat steps with grooves*	*more stability, plus better grip on the feet*
	Aluminium build	*more durable and it is light and rust free*
	Extension	*a greater series of heights can be reached*
	Rubber soles	*better traction, more stability*
	Colours	*aesthetic appeal*
	Retractable hooks	*to be able to hand tools and materials*

Domestic Kitchen Ladder	*Flat grooved steps*	*more stability on the ladder plus more grip*
	Fold away	*it can be stored in smaller places (ie. decrease storage space required)*
	Four legs	*a lot more stable and safe than leaning it onto cupboards, leaning on cupboards could cause damage, therefore decreases damage to furniture*
	Only three levels	*this is all that is required. not to big*
	Rubber soles	*better traction, more stable*
	Variety of colours	*it suits different decorations*
	Plastic built	*durable, light, ease of production*
	Hooks to hold legs	*keeps the ladder from moving when stores*

(d) This section investigated candidates' knowledge and understanding of research techniques, specifically as they applied to their major design project (MDP). A suitable response gave at least three techniques.

I surveyed people to ask their opinion on my ideas. This helped to see if there was a market for my project. It also helped to provide valuable information on other areas that could be included. My project was a theatrical cape so I read many historical and recent books on fashion. This gave me a background to my design. I wrote to many fabric mail order shops to get samples of different weights, colours and textures. This allowed me to see the wide range of materials available to use.

I spoke to professional designers and seamstresses for their opinions on different techniques, design styles and basic construction. This gave me a broader view on design and methods of professional construction.

The candidate in this case identified research techniques and provided clarification by indicating the information obtained.

(e) This section required candidates to apply the techniques identified in part (d) to a new situation — their ladder design.

A suitable response follows.

... surveys of tradespeople and those who work in domestic kitchens will give ideas as to the heights that the ladders need to reach ... Looking at previous designs will give an

understanding to the design and will show those that work and those that don't ... A professional in the construction area is vital to have on the team to ensure that all areas are made with quality and nothing is left out.

A complete response applied the techniques from part (d) and indicated the type of information that may have been developed.

General Comments

It was essential for candidates to spend time and view this question as a 'design exercise'. Each part of the question sought an increasing level of understanding of a candidate's MDP and of methods of visualising solutions and applying research techniques. Some candidates did not achieve maximum marks because they did not respond to all components of the question or did not clearly respond in terms of their MDP when required.

Question 14 Checksheet

			a		b				c						d			e		
			Sketches		Differences				For each design solution feature						Research			Dev't of new ladder/s		
									Tradesman			Kitchen			Types					
Centre No	Candidate No	Total	Tradesperson	Kitchen	Tradesperson		Kitchen		Explain	Explain	Explain	Explain	Explain	Explain	Describe 3 MDP research			Apply research techniques to ladders from (d)		
			2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Major Design Project (60 marks)

Markers' Comments

Many projects were unnecessarily marked away from the school that the student attended. Photographic evidence in the folio of the project in its final position is sufficient to 'prove' the relationship of a project to the design brief. Wherever possible, the project and folio should be marked at the school the student attends. Only in cases where it is absolutely essential should the project be marked away from school.

Greater care should be taken to follow project certification procedures. It is vitally important that the teacher or supervisor of a candidate keep a record or diary of progress of the work submitted by the candidate to help substantiate the authenticity of the project. Projects often have insufficient monitoring when built or implemented away from school. It must be noted that the majority of project work should occur at the school that the candidate attends, as stated in *HSC Subject Manual No 6*.

The major design project is marked holistically. Markers examine the product, system or environment (PSE) and the folio together. Decisions made by candidates in the conception and development of a major design project are evidenced in the PSE and mirrored in the folio.

Project Proposal (0 marks)

This section was handled far more competently by most candidates this year; however, long-winded, repetitive and inappropriate responses were commonplace. The project proposal should be concise and succinct. Many candidates spent far too much time 'setting the scene'.

The proposal was too often inadequately supported in terms of needs, areas of investigation and criteria to evaluate success, and many candidates were limited in their evaluation section.

Project Management (15 marks)

The better candidates planned (predicted) their actions before undertaking the realisation of their projects, and then evaluated their management both throughout the development and realisation, and after the project was completed. Those who did well in this section had generally laid out and followed clearly predefined plans; those who displayed poor management skills often presented incomplete projects.

A number of candidates failed to show evidence of management in their folios, and this was sometimes reflected in the realisation of the project, system or environment. Some candidates simply stated 'I am going to make X project with Y material'. There was little or no evidence of design development. In such cases, folios were generally disorganised and of poor quality.

Time, action and finance plans were much better this year. However, many were still in the form of a diary of past events, rather than of prediction and evaluation. In some cases it was obvious that they were written after the project was completed, since some action plans linked almost identically with the diary and were expressed in past tense. Many action plans failed to identify design, research and testing and only documented the construction of the project, despite the fact that such management activities were evident in the product, system or environment.

Many candidates could not distinguish between a finance plan and a list of receipts for resources. Very few candidates actually provided any evidence of forward planning in regard to finance, or justification of how they had arrived at a 'projected cost'.

The identification and justification of resources used was often poorly handled. Many candidates identified the material resource that they used but failed to justify why they selected it in preference to alternative materials that may well have been available. A large number of candidates did not acknowledge resources such as tools, techniques, energy, finance, information, time, skills, and human resources such as teachers, parents and industry practitioners. Consequently, those candidates failed to address many important syllabus requirements.

Project Development and Realisation (38 marks)

Candidates generally did quite well in this section. Some, however, still failed to show any evidence of the developmental stages, and their project was a realisation of their first and only design.

Good candidates based their project on thorough and relevant research, with appropriate testing and experimentation included and clearly identified. In such cases, decisions about the selection of materials, tools and techniques were related appropriately to the original project proposal and to the criteria for evaluation. Good candidates included evidence of testing through models, samples, photographs, videos or other appropriate examples.

In many cases, however, evidence of research was weak and too often took the form of a folio or folios full of brochures, without clear identification of their relevance to the project. Candidates need to keep in mind the importance of evaluating their research and experimentation. Design development from initial ideas and concepts was poorly documented, with many candidates nominating, almost from the start, a finite and inflexible plan.

In many cases, little or no experimentation or testing was apparent. The majority of candidates must have conducted tests and experiments to achieve the standard of work presented but many had not recorded them in their folios. Testing and experimentation were often included as an afterthought rather than as a 'means to an end' solution. In some cases, candidates carried out extensive testing and experimentation but ignored their findings.

Graphics need to be relevant to the sequential development of the project. Candidates often failed to show evolution of ideas — from concept sketches to final design drawings. Very few working drawings were presented in the folios.

There was a general increase in computer-generated folios. Candidates need to bear in mind that the fonts and styles they select need to be easily read and interpreted — some fonts and colours proved to be extremely difficult to decipher. The increased use of word processing and desktop publishing highlights the need for many candidates to be given instruction on how to use a spell checker. Typographical errors were prolific. Students need to be instructed on the importance of proofreading and correcting their work.

Practical production skills were at times of a very high standard, but many candidates compromised the final quality of their PSE by spending excessive time on their folio. The evidence of practical skills was quite well documented, often in the form of labelled photographs.

Candidates who encountered problems and tried to solve them often showed innovation in their work. When documented well, these candidates improved the quality of their project. Generally, however, documentation in this area was poor, with little evidence of creativity. This was caused, most often, because candidates had little idea about design development — rather, they chose a project and made it. Those who innovated for the sake of innovation (rather than improvement) tended to sacrifice some quality in their final project. Innovations must be relevant to, and an enhancement of, the design project.

Evidence of safety considerations should be apparent in the candidates' folios and in the PSE itself. It was pleasing to see that most candidates with electrical projects had them tested and certified as safe by a licensed electrician.

The provision of earth leakage safety cutout power supplies has also increased. It was still a concern to see photographic evidence of candidates working on their projects in unsafe environments. Protective safety equipment should be worn by candidates when necessary and safe work habits must be followed.

Project Evaluation (7 marks)

Evaluation proved to be the most difficult aspect for the candidates in most cases.

Some candidates documented their evaluation in terms of *liking it, being happy with the result* or *learning a lot*. Although these are worthy sentiments, they do not address the examination evaluation criteria.

Evaluation varied from the excellent to nonexistent. Evidence of evaluation throughout the project was often difficult to find because of poorly organised folios. Some folios included final evaluations, but often there was little or no evidence of ongoing evaluation. Candidates had obviously evaluated and made decisions throughout the project but had not bothered to document the facts.

Evaluation needs to occur throughout a project, as well as at the end, and it should reflect the criteria for evaluation identified in the project proposal. This was made easier in cases where candidates had assessed and analysed the needs of the target market (personal or wider needs), and then evaluated all aspects of their project according to those needs.

Good candidates not only provided ongoing and final evaluations but also had other people (eg peers, experts and potential end users) evaluate both their design development and their solution. Very good 'professional' evaluations were included in some folios, where appropriate.

Functional and aesthetic criteria were rarely evaluated well, and many candidates seemed to have a poor understanding of the meanings of these terms. Similarly, the impacts of their project on society and the environment were rarely addressed. This was often due to an inappropriate choice of project as well as a poor understanding of the terms *society* and *environment*.

There has been a dramatic increase in folios that are far too long, containing material that bears little or no relationship to the actual project. The candidates need to present the design folio in a clear and concise way. They need to be able to identify the difference between irrelevant 'padding' and material that communicates their design ideas.

The checksheet for markers of the major design project follows.

Centre No	***Design and Technology checksheet to aid in the application of the subject rules***																			
	Last Three Digits of the Candidate Number and the HSC Centre Number																			
D and T Checksheet 97	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**	**FOLIO**	**PSE**
	Project Proposal/0																			
Needs, areas of investigation, criteria to evaluate success																				
	Project Management/15																			
Action, time and finance plans and their application																				
Identification, selection and justification of resources																				
Management/15																				
	Project Development and Realisation/38																			
Documentation of research, experimentation and testing of materials, tools, techniques, resources The application of conclusions																				
Evidence of testing of design solutions and the application of conclusions																				
Use of communication and presentation techniques																				
Evidence and application of practical skills to quality PSE																				
Evidence of creativity – ideas generation and degree of innovation																				
Development & Realisation/38																				
	Evaluation/7																			
Record of evaluation procedures throughout the design project and the application of that evaluation																				
Analysis of functional and aesthetic aspects of design																				
Evaluation of the functional and aesthetic aspects																				
Final evaluation with respect to design criteria and impact on society/environment																				
Relationship of PSE to the proposal																				
Evaluation/7																				
TOTAL																				

3 UNIT (ADDITIONAL) EXAMINATION

Section I (12 Marks)

QUESTION 1 (Compulsory)

Methods of communiction in the twentieth century have developed rapidly. Today, a broad cross-section of the community utilises an extensive range of communication technologies.

With reference to ONE communication technology used extensively in this century, answer *each* of the following questions:

(a) Name the communication technology.

Most students were able to name a communication technology but several selected an inappropriate communication technology, eg a calculator.

Most selected the mobile phone or the Internet and gained full marks.

(b) Indicate an innovative step in its recent development.

The better to mid-range students named an innovative step that was relevant to the communication technology and was recent, for example:

(a) Telephone *(a) Mobile phone*

(b) Mobile phone *(b) Miniaturisation*

Many went on to discuss this at length even though not asked to do so in the question. An example of a better candidate's response was:

An innovative step in the mobile phone's recent development is the introduction of multi-functional features. Mobile phones can now perform tasks such as faxes, e-mails and printers and can replace diaries, address books and personal organisers. This combination of advancements within telecommunication technologies and miniaturisation means that people can now have a portable home office with which to organise and work with in both their social life and employment.

Poorer responses failed to identify a recent innovative step that was relevant to the technology mentioned in part (a), or went on to describe the special features of the communication technology named in (a), for example:

(a) Mobile phone

(b) Mobile phone (selected again as an innovative step)

(c) Explain the significance of this innovation and comment on the effects it has had on individuals and society. Refer to specific examples in your answer.

Better candidates explained the significance of the innovation named in part (b), not the communication technology selected.

Good candidates then explained the effects on individuals and society, differentiating between the two, for example:

The constant innovation of the mobile phone, most often in regards to size, services, battery life and convenience, is an example of technology pushing the limits to maintain a competitive edge. This in turn has significantly impacted on local economics, lifestyles and society's ability to do more faster. The introduction of cheap mobile phones has effected many companies, as Telstra moves to place towers around the urban user base for mobile connections, R and D increases in innovative ways to provide mobile services, through satellites and alternative to the GSM network and the de-regulation of the communications market allows more experienced and cheaper international interests. This technology has made contacting someone no longer a time wasting chore. People have so readily accepted the mobile phone that anyone with one is expected to be available for contact immediately, although this is not always the case. The only chore people face now is the frustration of a user who cannot be contacted, which has been addressed with voice mail and on screen messages. Society has been allowed to talk to anyone just about whenever it needs, which has significantly increased business communication standards and speed. The mobile phone, like computers, has increased the individual work load and stress, suffered now more than ever, of people working in the business world.

Mid-range responses included the significance of the innovation and its effects on the individual. Some difficulty was experienced, however, in explaining the effects of the innovation on society.

A mid-range example is:

During storms there will be less risk of damage such as fires started from broken wires, less electrocutions etc.

By the wires underground, our society will stay appealing to the public, allowing a better and possibly cleaner reputation.

(a) Cable television eg Foxtel

(b) Instead of the cable lines going up over our houses such as on our power lines, they have gone underground.

(c) By laying these thick, black, ugly cables underground, it minimises the amount of wires attached to our visible power poles. These power poles and cables/electrical wires often obstruct our beautiful surrounding and views. By the cable companies distributing the cables underground it will not be upsetting our local suburbs and turning them into mass spiderwebs.

The poorer responses lost their way and did not discuss the effect of the innovation on both the individual and society. Many students failed to explain the significance of the innovation as mentioned in part (b). One effect was usually mentioned. A poorer response follows.

The way the Internet has been marketed has had many positive effects on individuals and on society. One example of this is when schools get the Internet, students may then go home and show their parents that the Internet is a highly educational tool. This will then lead to more homes getting connected for educational purposes. Education is therefore a significant and very effective way to market the use of the Internet. Ease of communication and on line shopping are some other ways.

(d) Critically evaluate the effect of entrepreneurial activity on the rate of development of this technology.

This is the section where most students failed to score high marks.

Students had an extremely limited concept of what 'entrepreneurial activity' meant. They talked about company risk-taking but did not relate company activities to the development of an innovation. The poorer and mid-range responses did not include both positive and negative aspects. They may have mentioned the positive effects of the communication technology but did not indicate how entrepreneurial activity had affected the rate of development. A good example is:

Since deregulation of the telecommunications industry, the increasingly large growth of entrepreneurial activity has resulted in huge developments in the implementation of new overseas technologies. The Australian market is used by the Americans and Europeans to test new innovations in this field. As Australians are internationally known to accept and evaluate an extraordinary amount of new products. Some account this to Australia's isolation and wish to be included in the development of new technologies that might improve our social and personal dilemma. The market is currently unstable, as the entrepreneurial activity seems at a maximum and successors are being waited upon. The float of Telstra shares is on the surface a safe bet, but to get into such an industry at this moment in time is relatively dangerous, considering the price reductions entrepreneurs are offering. One might compare the situation to the fall of the Compass Airline when the price wars sent them broke. Similarly the same might occur in the telecommunications industry.

A mid-range example:

The first company to release a mobile phone was Telecom who later became Telstra. They now have competition when an entrepreneur brought Optus into Australia. Now Optus and Telstra fight to be the communication leaders. Their battle has brought down the fees society was paying for communication and each individual is getting a better deal.

With this competition brought more individual competitors such as Mobilenet and One-Tel. These companies specialise in the selling of mobile phones and are able to offer the community a wide range of services.

Entrepreneurs are bringing out new companies all the time and with these new companies are new mobile phones that are being developed to give the customer the best communication device they can get. The technological advancements of the mobile phone is growing every day with more and more people becoming a part of this wide communicating society.

A poor example is:

Entrepreneurial activity concerning the internet has been smart, cunning and successful. The activity included setting up certain web sites for almost every interest, making the internet for everybody's interests. The entrepreneurial activity increased the rate of development by generating knowledge between common people, so word of mouth would be a main source of advertising although it is not recognised as reliable and cannot be measured how successful.

(e) Discuss aspects of intellectual property as it relates to this technology.

Better candidates were able to identify various aspects of intellectual property and explain these well in relation to the chosen communication technology. For example:

The intellectual property in this industry is closely guarded with international patents and copyrights. An example of this is Motorola, who patent the ability of a mobile phone to receive a message once the cover is flipped open. This patent means that for the next few years other companies wishing to make flip open mobile phones must have an answer button to accept incoming calls. This means you require 2 movements to answer a call rather than 1. Further intellectual property regarding providing the mobile services is also under strict security. Companies are careful that the billions of dollars invested in pushing these technological limits do not send them broke through any leakage of information. This is most important for survival in the extremely competitive and ferocious market.

Candidates from the mid-range were able to identify some aspects of intellectual property but failed to discuss these aspects in relation to the chosen technology. Others discussed the issue of intellectual property without using specific terms (eg patent, copyright).

A mid-range example is:

The intellectual property that relates to the technology computers are varied and is protected under legislation.

Designers and engineers can either patent or sell their intellectual property.

Poorer responses revealed that candidates had very little idea of what was meant by 'intellectual property'. Many misinterpreted the question and discussed intellectual understanding in relation to the use of the communication technology.

A poorer example is:

This is the most sophisticated form of communication technology in 1997. This technology requires experts, experts and at the lowest intellectual level, experts. They deal with the hub of the world's communication network, standards must be more than perfect. Intellectual minds are a must. But you don't have to be very smart to use the internet. It is made user-friendly by the use of icons, push buttons and clear concise directions. The internet was designed so that everyone who is anyone can access anything they want.

Summary

The question was well answered, with most students demonstrating a fair knowledge of modern communication technologies and their effects on the individual and community.

A general observation from this year's and past years' examiners is that candidates should not lose sight of the fact that a 'critical' analysis or discussion must involve looking at positive as well as negative aspects.

The most discussed technologies were telephone/mobile phone, the Internet and cable TV, and the answers were often interesting to read and mark.

There was also a clear understanding of innovative concepts and the relevant aspects of intellectual property, including the need to protect intellectual property.

Section II (8 marks)

Candidates attempted ONE question from this section. All questions were of equal value.

QUESTION 2

Australia is known as an innovative nation.

a) Using one significant example, discuss this statement with reference to the history and nature of innovation and change in Australia.

Candidates who scored lower marks chose an example that was not Australian. Hence, it was difficult to successfully discuss the history and nature of innovation and change in Australia. Other candidates identified an Australian innovation but did not present an adequate discussion. For example:

The Australian innovation that has been recognised worldwide is the 'Hills Hoist' clothes line.

Australia, being such a 'young' country has done well for itself to be 'known as an innovative nation'. Designers have put much into their work to be recognised and have had a hard time of doing it. This is mainly due to the fact that it is such a young country that other countries didn't realise the potential that some of the potential that some Australian designers have behind them.

Average responses identified an Australian example of innovation. They referred to the historical development of the innovation. Candidates did not clearly identify which aspect of the design was innovative and only briefly referred to the history and nature of innovation and change in Australia. For example:

During the past Australia has been through 'booms' and recessions and when looking at innovations that have come from Australia most have come in boom periods of the economy.

One such innovation was 'Dynamic Lifter' although the idea of using chicken manure as fertilizer was nothing new, the process that was undertaken to make 'Dynamic Lifter' was an innovation in itself.

Dynamic Lifter was able to be sold because it was a time when people had money. It was also a time when farmers needed something new and gardeners were on the look out. When looking back to Australia's innovative past many innovations, until recently have been based around farming, or lifestyles now designers and inventors are looking toward new technologies and computers for inspiration.

Good responses clearly identified and described an appropriate example of Australian innovation. They were able to relate the history of the innovation to the product over time. Candidates identified how the innovation either responded to or contributed to change in Australia.

Australia is known as an innovative nation, due to it's innovations such as the 'Computer Sock'. The Computer sock was designed in 1960's, however was not realised untill 1980, as the prototype was 'shelved' when the designers couldn't complete the design successfully. The 'Computer Sock' is made from renewable resources and the design of the sock and thread of the wool and cotton has made it a leader in sock technology. The sock is designed so it doesn't fall down and is named the 'computer sock' to give an idea and image of innovation and technology. Many Australian men had to wear rubber bands and braces, originally to keep their socks up, before the change occurred (the introduction of the computer sock.)

b) Suggest how a design process can be utilised to improve Australia's success rate in realising innovation.

Poorer responses did not identify the design process and therefore made no link to Australia's success rate in realising innovation. For example:

Through many innovations Australians communicating with each other in order to improve Australia's success rate in innovation (through the Internet).

The average candidate was able to identify the design process or parts of it but did not relate it to the success rate of Australian innovation. For example:

An innovative design has nine elements in its design process:

1. Identifying a market opportunity

2. Obtaining and Managing Resources

3. Research and Development

4. Protection of Intellectual Property

5. Product Design

6. Obtaining Supplies

7. Manufacture

8. Promotion

9. Distribution, Sales and Service

Should this process be followed effectively, from start to finish, then this would improve Australia's success rate in realising innovation.

Candidates who addressed this part of the question well identified the design process and a number of its components. They were able to analyse each aspect and explain how it could assist in the success of Australian innovation.

A design process that is utilised to improve Australia's success is as follows:

- *Identify the market opportunity — establish the need for the innovation*
- *Organise and Manage Resources — look at what you have and need to create the inovation.*
- *Research and Development — Used to design and build on the inovation.*
- *Protection of intellectual property — Patence — to prevent the design/inovation from been stolen or someone else taking credit for it.*
- *Product Design — The design of the product/inovation*
- *Obtaining Resources — Getting materials needed to construct the design/innovation.*
- *Manufacturing — Constructing the product/innovation*
- *Promotion — Marketing the product/innovation to the consumer and wider community.*
- *Distribution — geting the product/innovation to the market place.*

c) Analyse how marketing can assist in improving Australia's success rate in realising innovation.

Poorer responses did not demonstrate an understanding of the concepts of marketing — some candidates only mentioned advertising. Most were unable to adequately analyse how marketing could assist in improving Australia's success rate:

Marketing can help tell people about a certain product. It introduces the product. It helps Australia's success as it tells people about the innovation and it is successful if people uses it or buys it.

Candidates who achieved average marks generally mentioned marketing as being more than 'advertising'. Some analysis of how marketing can assist in improving Australia's success rate was attempted. For example:

Marketing is a strategy that is evermore increasing as it is a means of communication between the businesses and consumers. Marketing can assist in improving Australias success rate in realising innovation by promoting the products innovative features and how it will benefit the consumer. Marketing also involves research into the need and wants of consumers in order for business/firms to keep innovating and bringing new products to the market. If marketing is successful and no other major barrier are in the way success will usually follow.

Candidates who answered this question well identified and analysed a range of strategies involved in the marketing of a design in relation to improving the success rate of Australian innovation. For example:

Marketing is important for any product as theres no point in making the best innovation in the world if no one's going to know about it. Marketing involves the successfull use of entrepreneurial skills as well as the use of the following six steps:

- *Strategic planning — having a well thought out plan of attack ie. what media to use, themes etc. is important here.*
- *Strategic flexibility — You have to be open to a change in plans to cater for changing needs to demands or ideas.*
- *Change Orientation — the product must be marketed so that it highlights why to change what's been going on for years. This requires changing what the consumers are used to doing.*
- *Communication skills — you must be able to communicate effectively with relevant organisations.*
- *Networking — this involves the theory of helping others to help yourself.*
- *Negotiation — using enterpreneurial skills to negotiate for the best bargain possible.*

By following these steps the success of innovation will certainly be greatened as these steps are an accurate way of sticking to a marketing strategy. As well as these steps the 'needs' and 'objectives' should be clear before beginning.

d) Propose and describe an entrepreneurial activity that was or could be applied to the example you gave in part (a).

Candidates who did not answer this question successfully did not describe an entrepreneurial activity and often did not relate it back to the example given in part (a). Some candidates did not respond at all. A poorer response is:

An entrepreneurial activity that Norm and Nadia jennings carried out would have to be the new drinking system that they produced. The chicken were spilling the water all over the manure so it was hard to dry out for use in the Dynamic lifter. Norm jennings observed this problem and went about innovating a new drinking system that they could use that wouldn't leak and that couldn't spill.

Average responses proposed an activity but did not clearly describe why the proposed activity was entrepreneurial.

Good candidates were able to identify and describe an entrepreneurial activity that was or could be applied to the example given in part (a):

The entire development of Dynamic Lifter involved entrepreneurial activity. Norm Jennings took a great risk in developing this innovation. He spent 15 years perfecting it and for 11 of these years he worked 7 days a week almost day and night. To his project was completely funded by himself and throughout its development he received an extreme lack of support from people whom he asked to help him. He took a great risk in spending so much time developing it and funding it with his own money especially when it took so long. Norm had the belief that what he was doing was the right thing and was going to work hence everyone who knew him thought that he was crazy to be doing what he was doing. When he began developing it he could not find a way to get all of the moisture out of the manure and he continually worked on finding a way. When he realised what the problem was he was able to continue with the development however he was taking a big risk in the beginning by trying to develop something which appeared to be impossible in the beginning.

Norm Jennings development of Dynamic Lifter shows a great deal of entrepreneurial activity being involved. This occurred through the many risks which were taken throughout the development and the belief that he could achieve it which he did.

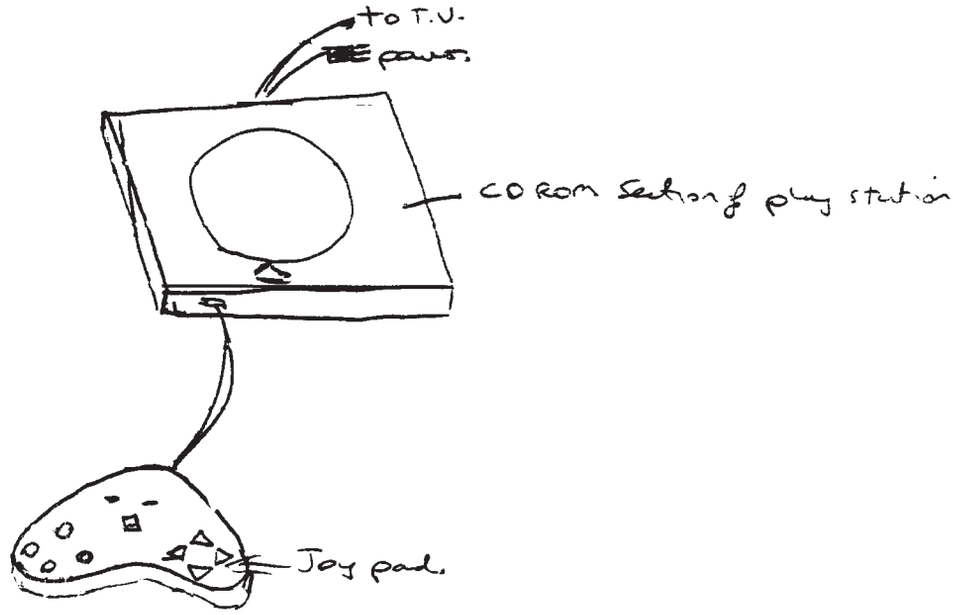
QUESTION 3

'Simulation' is used in many fields, ranging from entertainment to the workplace. Examples include prototypes, models, mock-ups, computer games, and flight-training simulators.

(a) Describe a simulator or simulation (words and sketches) that you are familiar with, and discuss what need it fulfils.

Excellent to very good responses provided a detailed description of a simulator or simulation, with a detailed sketch or sketches. For example:

The Sony Play Station



The play station is a simulated computer game product which uses CD games and plugs into the back of a television. A variety of games can be played with a Sony play station, with amazing quality graphics and simulations.

In this response, the need of the simulator/simulation is also discussed in detail:

The Sony play station provides high quality games for the entertainment of people of all ages. It provides realistic and simulated graphics that improve eye and hand co-ordination. It is designed to adapt to almost all television screens regardless of size. It is light compact and easy to store. Aesthetically pleasing.

Good responses described the simulator or simulation but generally did not give much explanation of the need it fulfilled. Simulators or simulations often described included the flight-training simulator, computer games and prototypes of aspects of the 2 Unit major design project.

In poor responses, candidates stated the name of the simulator or simulation only. No description or discussion was given. For example:

The models that were used in the filming of Star Wars

(b) Outline the criteria that would have to be evaluated to ensure that the need discussed in part (a) is met.

Good responses came from candidates who were able to list criteria and explain how they could be used to assess the usefulness of the simulation or simulator:

The criteria that would have been set for the flight simulator to be successful are as follows.

(i) It must be able to replicate the exact condition that are in a real plane.

(ii) They must feel as if they are really moving and controls must be together with the cabins movements ie. no delay.

(iii) It has to be a safe environment.

(iv) The current simulator Qantas has cost over 4 million dollars each, in designing a new one perhaps costs could be lowered.

Mid-range responses gave few criteria, with little detail:

The criteria that would have to be evaluated is that of the similarity it is to the original game on PC and that it has a realistic effect so it actually feels like you in the concept.

Poor responses repeated the need:

You would have to see if it actually was easy for people with arthritis or disabilities to operate the AVU (Automatic Vanity Unit) and wash their hands and face. Because the AVU has a sensor if the person can move their hands to touch the water then they'll have no problem washing their hands and face.

(c) Identify an innovation and explain how it led to the development of the simulator or simulation described in part (a).

This part of the question was often poorly answered as many candidates were not able to make the link between their identified innovation and its role in the development of the simulator or simulation identified in (a).

Good responses identified an aspect of the simulator or simulation and discussed an innovation that contributed to it, for example:

The designer began to use hydraulic systems ... letting the cabin move more freely … This innovation led to the effective new flight simulator ... that was needed to make the simulator a most effective machine.

Mid-range responses identified the innovation but gave little explanation:

An innovation that was brought up in the computer industry was that of Computer 3D modelling and Sibeon graphics innovations ... possible to create realistic images.

Some poorer responses identified the simulator or simulation in part (a) as the innovation, eg computer games led to the development of more computer games.

(d) Critically discuss the factors that influenced the degree of success of the innovation identified in part (c).

This section of the question was best answered by students who were able to formulate a discussion or a series of points that addressed the promotion and consequent acceptance of the innovation.

A mid-range response:

The factors that influenced the degree of success of the innovation, Sega Master System, are

– *it was compact and aesthetically pleasing*

– *it was able to plug into the back of and be used with almost all televisions, which most households have.*

– *It had a variety of different entertaining computer games, most were in colour, to suit the taste of different customers.*

– *It was easy to change games and could have cartridges that had more than one game on them.*

– *It was a much cheaper and easier way of playing computer games.*

– *It just used one 240V powerpoint, which most households had, not batteries that needed to be replaced regularly or recharged.*

– *Computer games were very popular with children and the games on a Sega Master System were easy to play, with some challenging higher levels with most games.*

– *Ideal gift for Christmas and most households could afford one.*

– *… joypad was available to buy so more than one person could play at a time. Two people could play each other!!*

A good response:

Factors that influenced the degree of success of the use of passive solar energy in home design/and included in home models include -

- *the extent to which passive solar energy is used in the home design — this determines how energy efficient the home is to be.*
- *clients willingness to use the concept in their proposed new home and to pay for any additional costs its use may create.*
- *Resources materials available to use in the building of the energy efficient home.*

Poorer responses did not address the question or relate back to part (c):

The success of the virtual computer technology can be directly linked with the success of the products which it is used for, such as virtual golf and numerous other virtual activities. The products have not taken off as anticipated and are mostly used at exhibitions and displays. It is just another advancement in the technological age in which we are currently living.

QUESTION 4

Innovations in medicine, ecology, transportation, and the built environment have impacted on society.

Select ONE of the areas of innovation mentioned above.

Across all candidates there was an array of responses that illustrated the broad interpretation of the question and the different approaches to teaching and learning.

It was refreshing to see the number of students who successfully tackled controversial issues such as cloning and life-support technology.

(a) Discuss a significant innovation and the social change that has occurred as a result.

The majority of candidates identified a significant innovation ranging from dynamic lifter to power steering to the bionic ear. Good candidates then discussed this innovation, referring to its development, utilisation and related pros and cons. Poorer responses named the innovation but candidates lacked a depth of knowledge to ‘discuss’ the innovation effectively. Social change that resulted from the innovation was outlined and discussed by the better candidates, including factors such as employment, economic effects, quality of life, fear of technology,

friends and fads. Less able candidates often gave generalised opinions about lifestyle change. Poorer responses referred to individual change instead of social change, eg *Farmers do not have to pay for droppings to be removed from farm as they are now used for dynamic lifter*.

An example of a good response is:

Built Environment

A significant innovation that has affected areas of the Built Environment is MEMTEC'S, 'CMF' ('Continuous Micro Filtration' system). The applications of this system are far reaching, not only is it used in medicine (for the making of medicines and filtering of blood etc.) but in the built environment. The greatest areas of specialisation of the CMF involves:

- *water purification*
- *food clarification*
- *waste treatment*

As a result of these aspects, the membrane covers, the water we receive to our built environments is cleaner and healthier. As a result the city's are more hygienic and healthy places to live in.

By Food Clarification the membrane not only tests what is suitable for human indigestion but what grades of say meat are available (ie. primary of 1st quality secondary of lower quality etc. etc.). This has enabled humans to lower the risk of eating dangerous foods (it could of been used with the 'mad cow' epidemic for instance) and as a result society is a healthier place to live in.

By the membrane treating of waste we also create a healthier environment for not only ourselves but the creatures on land and in water. It is ecologically sound as well as ensuring our built environment is sustainable and does not kill itself by being too wasteful.

An example of a poor social comment follows:

This has meant people can take the same amount of time, but see their family and friends for longer.

(b) Indicate the commercial implications of this innovation, highlighting entrepreneurial aspects.

Good candidates differentiated clearly between commercial implications and entrepreneurial aspects.

Weak responses tended to omit entrepreneurial aspects completely. Another misunderstanding was evident in discussions about the cost of the innovation to the public, rather than the commercial implications of the innovation.

The majority of responses regarded profit and sales as commercial implications.

An example of a good response:

Whilst these corporations are currently placing emphasis on R & D there is of course a view toward profit. If the organisations achieve their objectives they will operate like any other medical business. The business will operate under the profit notice as any organisation does.

However, after up to 10 years of research spending these corporations will be looking to recoup their outlays when they begin sales. This will mean that the cost of synthetic organs will be very high and therefore not widely available.

These firms currently operate in an oligopoly — with few sellers. However, as they come closer to commercialisation competition is projected to increase substantially.

A typical good response to entrepreneurial aspects:

The entrepreneurial aspects would be making decisions as to which market should be targeted taking the risk of actually selling this innovation despite it being labelled unethical.

The number of candidates who could not demonstrate a sound knowledge of the term 'entrepreneurial aspects', considering its weighting in the syllabus, is of concern.

This response demonstrated a lack of in-depth understanding:

Using a closed system in the company will be beneficial for the company in the long term as socially the company is seen in a better light. The entrepreneurs consience and private goals would also be satifified.

(c) Explain the ethical issues raised by this innovation.

Most candidates gave examples of ethical issues but did not explain them in relation to part (a). Better candidates identified issues relevant to (a). Poorer responses came from candidates who lacked an understanding of the term.

Good answers included discussion of ethical issues such as privacy, freedom of information and confidentiality.

An example of a good response:

There are no ethical issues raised by this innovation. All its application only do good things. In medicine it saves lives, in water treatment and food clarification it stops humans from getting sick and in waste treatment facilities it stops built environments from damaging surrounding water ways to .... .

The only ethical issues that exist in the innovation involve business ethics. Hence the company has not had problems it consults its shareholders on major changes and is involved in fair partnerships. Ethically it is correct in all its business and innovation aspects.

Poor answers could not logically and concisely explain an 'ethical issue'. There was also a lack of linkage back to the original innovation.

An example of a poor response:

A lot of people, most expecially those of older generations, feels that as people were not given wings, they were not meant to fly, but most people have no worries about it all.

(d) Identify possible legal aspects of this innovation.

Less than half of the candidates mentioned the Occupational Health & Safety Act and its implications for the specific innovation. They mentioned safety of workers, production standards and so forth, but not OH&S.

Many responses involved hypothetical situations but lacked a true understanding of the actual legislation involved.

Good responses identified and explained at least five legal aspects specific to the selected innovation.

Average responses mentioned a list of possible legal aspects but did not relate them to the selected innovation.

Poor responses included only one legal aspect bearing little relationship to the selected innovation, or none at all.

Very good responses actually referred to case studies as examples — articles from newspapers etc.

An example of a good response:

A legal aspect of this innovatin comes when we analyse the drawbacks of this as a method of construction.

In Ballina — 1994 a man was killed when a 5 metre concrete slabs falling out of place when being moved in or off the truck. The legal consequences are obvious. Compensation law suits, etc.

Also there are many other areas which may be addressed in concern to legal matters. Things such as:

- *Building codes*
- *Structural stability laws*
- *Council size and position requirements*
- *Construction Act 1974*

These legal requirements offer a number of guidelines for the builders using this new innovatin to follow, if they do not then the appropriate penalities will apply.

An example of a poor response:

Land legislation would be some of the legal aspects involved as if you are building on someone else's land is illegal and is an implication in the industry.

Specialised Study (30 marks)

Markers' Comments

The specialised study includes both the research and development of a concept related to the 2/3 Unit (Common) major design project (MDP) and the documentation of all the steps involved in this process.

Overall, the specialised study showed great improvement from the previous year, with a greater proportion of candidates more accurately addressing the subject criteria. Candidates more closely targeted the assessment criteria as indicated in the subject manual and clearly had a better understanding of terminology used.

It must be stressed that the length of the study is an issue. Fewer than 10% of specialised studies were excessive in length; however, some were as long as 5000 words. In respect to the marking criteria, these candidates could be regarded as placing themselves at an advantage over those candidates who stayed within the word limit and who abided by the rules in the *TAS Stage 6 KLA Handbook.*

Concise studies more accurately met the criteria and teachers would be advised to support candidates in maintaining the body of the study at 1500–2000 words. Reference to an appendix to validate the data is sufficient within the body of the text.

Appendices and extracts of 2 Unit major design projects need also to be concise and clearly address the criteria. Samples of questionnaires, surveys etc are enough to indicate where the data in the study is sourced.

Extracts need to reflect the nature and intent of the 2 Unit major design project. The full reproduction of the 2 Unit MDP folio within the specialised study, or as an appendix, should be discouraged by teachers. Photographs and photocopies are appropriate. The ability to extract information from the raw data discovered by candidates is an important aspect of 3 Unit Design and Technology.

It should also be impressed upon candidates that the 3 Unit specialised study is not a simple 'rework' of the 2 Unit MDP, but must be developed from the 2 Unit MPD as a research and development project, resulting in an innovative application, marketing strategy, manufacturing system or new and improved resource.

Many candidates reproduced syllabus definitions of these within the study, which clearly reduced the number of words that they could allocate to the actual study within the 1500–2000 words.

In general, studies were much better than in 1996. Candidates who are fully aware of the marking criteria as shown in the subject manual clearly do much better. Marketing strategies were by far the most popular choice of candidates and were handled well. Candidates who selected an innovative application often simply reworked their 2 Unit project and needed to be more clearly aware of the requirements of that option. New or improved resources and manufacturing systems were reasonably well done.

Many candidates adopted a 'business study' approach rather than focusing on the design and technological aspects of their study.

Candidates need to revisit their evaluation criteria frequently throughout the study so that they do not lose sight of the aims that they have set themselves.

Many candidates submitted work in large A3 folios. This is not a concern during marking; however, the carriage of these large portfolios does prove difficult during the double marking and clerical procedures.

Relationship between the 2 Unit Major Design Project and the 3 Unit Specialised Study

Candidates need to be clear on the requirements of their choice of either:

- an innovative application that refers to the adaptation of an aspect of the 2/3 Unit (Common) major design project and its application to another context (Option 1)

OR

- a manufacturing system that refers to the development of an effective and efficient procedure for the further production of the 2/3 Unit (Common) major design project (Option 3)

OR

- a marketing strategy that includes the development of a strategy for the pricing, distribution and promotion of the 2/3 Unit (Common) major design project (Option 4)

OR

- a new or improved resource that refers to either the improvement of a current resource used in the 2/3 Unit (Common) major design project or the creation of a new resource that better meets the needs of the major design project (Option 2) in order to address the criteria as they apply to each of the above.

Careful thought needs to be given when selecting an option to develop a specialised study that is most suited to the MDP.

It became evident during the marking operation that many candidates could meet the requirements of 'extract of 2 Unit MDP' by simply photocopying the project proposal and the final solution. Markers found the information contained within these two copies was more than adequate to validate that the 3 Unit specialised study was a development of the 2 Unit MDP.

Candidates who omitted extracts of the 2 Unit MDP and did not establish the relationship between the MDP and specialised study were not awarded marks for the project proposal. Those who omitted extracts but did show a relationship were awarded a maximum of 4 marks for the project proposal.

An example of an appropriate extract is shown below.

Extracts from MDP

Situation

Being disabled is a problem that, for many people has to be overcome in order to survive from one day to the next. In coping with the day to day hurdles that disabled people, such as my grandfather are confronted with, is the need to transport their equipment, such as wheelchairs around with them. When travelling by vehicle, the problem arises in loading and unloading of wheelchairs etc. in and out of the car. Therefore a suitable device that is easy to operate, would be ideal in helping the carers of disabled people, cope with day to day life.

Brief

I am to construct a device, which can easily and efficiently lift a wheelchair in and out of a vehicle, in order to make life just that little bit easier for the disabled and elderly of today's community.

Photocopies, photographs or reprints are all appropriate ways of showing the extract from the 2 Unit work.

Project Proposal

Concise and clear descriptions of the relationship between the 2 Unit MDP and specialised study gave candidates the maximum marks for this section. This section is marked out of 5 marks and includes the relationship between the 2/3 Unit (Common) major design project and the specialised study; justification of the study; aims of the study; and criteria established to evaluate success of the study.

With regard to the relationship between the 2 and 3 Unit work, one candidate wrote this high-range response:

In the process of realising my 2 unit MDP, I developed a one-off wearable garment and shoes from TAZO's. In my 3 unit study I intend to develop a marketing strategy in order to gauge the marketing response for alternate materialed clothing.

I elected to do a marketing strategy because it will allow me to determine if there is a need for Fashion Designers, of one-off wearables from alternate materials, such as my 2 unit MDP.

A mid-range response:

I have decided upon the project as a result of observing an existing design of wheelchair lifter, currently on the market. The fact that the current designs are hard to operate and do not offer the user a wide variety of lifters to choose from on the market, it is therefore a logical extension of an improved design to determine it's marketability.

Justification for the Study

Candidates often evaluated the various options for a specialised study and based their selection on a critical analysis of each option. This is not a complete response to the criteria. Candidates are better served by justifying the study, not the choice of option.

Some candidates were able to justify their study by showing needs identified in the 2 Unit MDP or needs that the 2 Unit MDP created. For example:

This option is relevant to my future as I wish to study Interior Design. On graduating it would be not only reassuring and helpful but also to my advantage to be familiar with effective and successful methods available to me for use in marketing my interior designing skills and finding my place in industry. Being aware of how to professionally market myself would make a good first impression and thus, either create employment opportunities or generate clientele and an eventual reputation as an independent Interior Designer.

This justification regards an innovative application:

The study is about passive solar design, PSD is an architectural approach to solar heating and cooling, using the forces of nature in combination with the fabric of the building. This house then becomes its own solar collector, storer and distributor of solar heat.

The study is about the problems and procedures of incorporating PSD into the built environment.

The reasons for doing the study are

it is innovative

it is practical

it is an area that needs to be further utilised in Australia.

Aims of the Study

Candidates who listed a series of dot points found that they adequately covered this criterion, showing the outcomes expected at the completion of the study and listing the things that they aimed to do in the study. Candidates are well advised not to set unattainable or hypothetical goals in this section, eg 'establish the dominant market share' or 'set up mass production'. The development of marketing strategies and manufacturing methods may well be enough for a candidate to satisfy all criteria.

For example:

The aim of my specialised study is to devise a marketing strategy that would be suitable and possible for me to use to market myself as a future interior design graduate …

or:

The aim of the study will be to find out if there is a market and need for such a lifting device. In doing so I will have to,

- *Determine the current designs on the market and the prices people are willing to pay for them.*
- *Identify the categories of people who could constitute the buyers of these products.*
- *Identify distribution methods and point of sale*
- *Find out whether there are people who could want to buy the lifter.*
- *Determine the method by which the lifter will be sold and who will sell it.*
- *Decide whether it is safe and has any undesirable social or cultural impacts.*

or:

Aims of the study

The aims of my specialised study are:

- *gauge if there is a market for one off fashion designers*
- *determine the appropriate market — do people prefer alternate or conventional materials?*
- *Identify a target market*
- *Determine the already existing prices of one off wearables*
- *determine whether people are willing to pay this amount.*

Criteria Established to Evaluate Success

Successful candidates gave clear expressions of the assessment criteria that they would use to evaluate the success of their research and their study.

In order to analyse and evaluate the processes and results of chosen methodologies (interviews, surveys, literature searches etc), candidates needed to establish some criteria. A well-written set of criteria will also allow the student to focus on the more relevant aspects of the study.

For example:

Success will occur if:

- *Consumers express a need for more alternate and original wearables.*
- *A suitable market exists, (if consumers will have alternate materialed garments designed)*
- *Consumers are willing to pay an appropriate price that will result in a profitable business*

or:

I will consider the study a success if I have found out the following.

- *The level of interest in the design.*
- *The likely number of buyers.*

- *A possible price.*
- *Likely distributors and sellers for the lifter.*
- *Whether the lifter can be patented.*
- *Does it require high safety regulations.*

Candidates who failed to establish such criteria were less successful overall because a clear direction to their study was not as apparent to them.

Methodology

Marked out of 15, this section is concerned with the way in which the research and development was conducted. It is the major component of the specialised study. The process of research and development should be appropriate to the aim of the study.

In the methodology section of the documentation it is necessary for candidates to describe the process of research and development. This includes research, ideas generation, testing, modification, decision making, development and reflection. Throughout the process, candidates should evaluate what they are doing.

Use of a Range of Methodologies

Candidates are expected to identify, select and utilise a range of reliable, valid and relevant research methodologies in the specialised study.

Many candidates included surveys, questionnaires, personal communication, pilot study evaluation, statistical analysis and literature searches, Internet and other information technologies in their research. Candidates are well advised to summarise this range in a short, concise format.

For example:

From the numerous research methodologies available I have selected the following:

1. *SURVEY — I intend to survey men and women aged from 16 up in the cities centre and suburbs. This survey will help with the aims of my study (100 surveys)*
2. *INTERVIEW — I intend to interview Jeanne Little a fashion designer of alternate wearables. As Jeanne is already in the market she will help determine if it is viable, who her market is etc.*
3. *DESK RESEARCH — (phone, fax, letters) Lizzy Gardiner another fashion costume designer who works with alternate materials will also be contacted by fax.*
4. *BOOK RESEARCH — This will help me find out the framework of marketing theory.*
5. *MAGAZINES AND ARTICLES — Numerous articles will give helpful information on target markets and pricing.*
6. *COMPUTER FILES — Internet.*

or:

These methods will be appropriate for my specialised study for the following reasons.

INTERVIEWS

Interviews with people working in the metal fabrication industry could be used to find out what materials are most appropriate for different components of the MCM. A verbal interview was appropriate as I could speak to them while they were working.

OBSERVATIONS

Observations could be an appropriate way of finding suitable materials. This could be done by observing and holding the materials to assess its weight.

Observing the machinery available for the manufacture of the MCM in the metal fabrication industry.

MY OWN KNOWLEDGE AND EXPERIENCE

Knowledge from my experiences is appropriate research methodology to be utilised as I have knowledge of welding techniques and methods from attaining a TAFE WELDING AND METAL FABRICATION CERTIFICATE (refer to extract 4 — certificate)

SECONDARY RESEARCH METHODS

Secondary research methods will involve looking and reading through texts to find information. This shall be utilised to find information in current manufacturing systems, plus research into the process of TIG welding and appropriate welds for joints.

Critical Analysis of Collected Data

Many candidates found graphical methods to be valuable when explaining and analysing data that they had collected from their research. This approach also enabled them to show easily how the data affected the outcomes of their study.

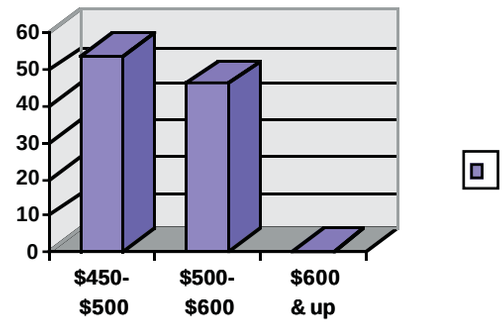
For example:

Interviews

The interviews with people and businesses currently servicing the market, and also people who were in need of the product, were of great aid in developing the marketing strategies in the following ways,

- *They described what they wanted out of the product.*
- *They described the problems with existing designs.*
- *They described the external factors which will influence the marketing strategy, eg government influences — standards regulations,*
- *They described the methods of distribution & target markets of their products.*

This candidate continued to analyse the data collected from surveys, desk research and articles in similar ways, and utilised graphical methods where appropriate. Here is one example:



What price would they be willing to pay?

Some candidates talked about the research that they would do, but did not actually do it, making the analysis of collected data impossible. Hypothetical studies are not well rewarded in the subject criteria.

Poorer studies presented very little data as a consequence of the lack of actual research.

Generation, Testing and Modification

Generation, testing and modification of ideas was generally well handled by those candidates who attempted this section. Various strategies were used to communicate these ideas including computer presentations, which candidates and teachers are reminded should be presented in hard copy form.

Better candidates were able to use their research to stimulate idea development. For example:

By surveying people in what I believe initially would be the target market (people over 20 years old), I found that the market would best suit those people in the age groups between 20–40 years and those 50 and over. This was because the people who were willing to use the lifter in the 20–40 age group were nurses who complained of problems they were having, day in and day out, manually lifting wheelchairs into the boot of vehicles …

From the surveys I was able to successfully determine, that potential buyers were willing to pay between $450–$500 and $500–$600 depending on the complexity of the final design.

Preliminary ideas were often tested and modified by better candidates through feedback from trialling or survey. The development of initial ideas, their testing and development was a strategy commonly adopted by better candidates.

Poorer attempts in this section did not show any testing or modification of ideas. Some candidates did not attempt this section.

Description and Justification of Resources Used

Many candidates used tables for setting out this section; this proved to be an easily understood format. Some candidates integrated the resources with processes and often did not fully address both areas.

For example:

Resources and processes	***Rationale for the use of resources or processes***
Interviews	*Has enabled me to find out information from experienced people, who are involved in the marketing and manufacturing of wheelchair lifters at the moment.*
Survey	*Have enabled me to examine the market for the lifter accurately.*
Desk Research	*As a result of sending letters and making phone calls, I have successfully and accurately located the sources of information that were needed to determine the potential marketability of the easy lifter.*

This candidate has addressed the processes undertaken but has not presented a description and justification of resources used, though some were mentioned and given some credit.

Many candidates mentioned resources that they had used throughout the study but failed to place them in the summary. Candidates are still given credit for these resources if they describe and justify them.

Too many candidates failed to adequately identify the resources that they used. Some candidates used only their own experiences in their specialised study, or experiences from their 2 Unit project.

Description and Justification of Processes Undertaken

Candidates who satisfied this examination criterion well could describe the process that they undertook to complete their study and justify the use of this process.

Justification proved difficult for many candidates; those who achieved success related the effectiveness of the processes used to the defined aims of the study.

An example of a candidate's work:

Resources used:

The resources I used throughout the study include:

People: *Jeanne Little, Lizzy Gardiner, Maria Guillano are three experienced fashion designers I interviewed by phone and fax. They are all a valid and reliable resource as they have experience in the field.*

Finance: *I had some money remaining from my 2 unit MDP which will help with the monetary side of the study, eg fax, std phone calls etc.*

Time: *I have almost 11 months research time for this study which I used effectively.*

Information: *the information I have found and received throughout the study is phenomenal. I have made sure all the listed information is valid and reliable.*

Materials: *Paper has been the main material used to print on, copy with and to fax with.*

Tools: *Computer, phone, fax, pen are all resources that have helped through my study.*

The processes I undertook include:

Surveys: The survey was set out well, however I did not give it to the appropriate type of people. I surveyed about 100 Sydney workers and school/uni students. The survey should have been given to celebrities etc. The survey did however show me there was no market for fashions like my Tazo dress locally. My other survey on company names and labels was very reliable resulting in a quick decision.

Interviews: In total I interviewed 7 people in the design profession and in companies associated with Tazo's. The interviews were all very valid and reliable as I was dealing direct with professionals. The interviews gave me most of my valid information for my study.

Companies: Talking to many marketing employees in large firms gave me insight into how promotion for products, works.

Articles: Reading business reviews and collecting articles relating to my study helped give an unbiased view on weather there is a market for designers like myself.

End Result

Marked out of 10, this was the most poorly completed section of the specialised study. Many wrote it almost as an afterthought, yet it should be the culmination of all their efforts.

Synthesis of Ideas

Candidates who related the synthesis of ideas to their criteria to evaluate success performed best in this section. For example:

The following outlines the specialised studies success, assessed against the set criteria to evaluate success.

From the data collected through my surveys and from conversations with professionals, a need for a more diverse range of original and alternate wearables is clear. The wearables would be similar to my MDP in that they would be made from alternate materials.

My surveys and interviews with professionals showed there was not a market for consumers to have alternate wearables made for them. The consumers were not willing to pay the appropriate price and did not have a need for such eccentric clothing. After conducting more research to find an appropriate market, the television, and celebrity field seemed to be interested. The celebrities and companies had appropriate outings for eccentric garments and could use them in promotion.

From this I have deduced that there is a market, however from talking with people already in the field/market, it is very competitive and there is no real need for more designers. I don't think it would be a profitable investment for 'ECCENTRICA' to embark in. Maybe the international design scene would be a more reliable and demanding market.

My survey indicated that only a small percentile were willing to pay over $300 for a garment. This would hardly cover materials, let alone time and commitment. Experts that I interviewed said one-off garments should be around $3000. The companies that I spoke to all had advertising and promotional budgets and said $3000 was too much for one promotional piece.

Consumers were not willing to pay an appropriate amount for me to make profits, perhaps international celebrities would.

In all my study was unsuccessful in that it did not meet the demands of my criteria to evaluate success. Also the pricing and promotion would be hard to envisage as the products would be made to order through 'ECCENTRICA'.

Other candidates stated the product of their study by showing a synthesis of data in a summary form. Graphical means were also used, leading to flow charts for manufacturing systems, brochures and point-of-sale material for marketing strategies, drawings for innovative applications, and photos and diagrams of new and improved resources.

Another candidate's work:

Synthesis of ideas leading to option/study.

The results of market research were the basis for all decisions made to achieve the end result. The project has a good design and there is currently a need for such a lifter on the market. The results of the research have enabled the strategy to be developed with reference to the target marketing strategy.

Critical Analysis of Effectiveness of Study and Viability of Proposed Development

Critical analysis involves reviewing the benefits, costs and implications of, in this case, the specialised study, the effectiveness of the study and the viability of the proposal.

Better candidates focused their attention on the study, evaluating the procedures and processes used in the development of their marketing strategy, manufacturing system, new and improved resource or innovative application.

Some candidates talked at length about the proposal and the results of their study, rather than the effectiveness of their methodologies.

One candidate wrote:

EFFECTIVENESS OF THE STUDY

I would say that my study has been effective and successful because-

- *It has provided me with a more than adequate broad collection of more information which has offered a variety of possible strategic ideas that could be used to promote myself as a future interior designer.*
- *I feel comfortable with implementing the proposed marketing strategies to realisation stages in the future. Those of which are all both suitable and ideal for me as an individual.*
- *The strategies established are realistically possible to use little or no cost to implement effectively.*

And another:

Critical analysis of the effectiveness of the study

The marketing strategy of the Easy Lifter, has met the stated aims to a high degree.

I have established a firm product name and I have already been successful in finding a buyer. Based on this success, I have established a possible retail outlet and a target market, being that of carers of disabled people.

From the criteria to evaluate success, I have been successful, as a result of,

- *Interest shown towards the design.*
- *People being prepared to buy it at a reasonable price.*
- *Finding a reasonable price*
- *Finding a method of selling the lifter*
- *Finding that it is worthwhile placing a patent on the lifter.*

In the assessment of the viability of the proposal, many candidates omitted a critical analysis and seemed to ignore the good work that they had done in the evaluation of their methods. This section was generally poorly done by candidates with only a brief, hypothetical analysis. Most did not effectively use the work from the research that they had done.

Better candidates referred back to the raw data they had collected and included that in the assessment of the proposal's viability. For example:

Critical analysis of the viability of proposed development

I have established through the opinions of Occupational Therapists, also an engineer and a patent attorney, that the proposed easy lifter would not only suit the needs of target market, but also operate safely and efficiently to acquire a patent being placed on the final design.

The pricing strategy will meet and "undercut" quite considerably the current market of wheelchair lifters, which I had set out to achieve from the beginning. By using the promotion strategy set through the specialised study, the product will receive well directed publicity, aimed specifically at the target market.

Therefore I believe that the wheelchair lifter will be viable when the following points are finalised:

- *The cost of producing the lifter is finalised.*
- *The provisional patent has been finalised and filed at the patent office.*
- *A manufacturer has been organised.*

Another example:

The outcome of my research shows that for me to become a fashion designer of one-off alternate wearables would not be feasible or practical in Sydney's local environment. The companies I approached were interested, however there are only so many promotional garments each company wants, and in the other time no one else was interested in a garment made from alternate materials for a profitable price. Designing these wearables could become a good hobby with feasible rewards, but would not be a profitable business proposition.

Candidates are better served by assessing the viability of the proposal in an ongoing manner while conducting their research. Including questions regarding viability in surveys and interviews will provide data on which to base accurate judgements about the end result.

Potential Impact on Society and Environment and Associated Ethical Considerations

Many candidates showed a lack of depth in their interpretation of societal impact, environment and ethics. Most concentrated upon global issues, which, in the main, made the task very difficult for them.

A broader understanding is shown in the following example.

The impact on society:

If there was a market for my designs it would mean employment opportunities not only for myself, but if the business was to grow, for other people to.

If I were to design and create such garments the community would be subject to a more unique and diverse style of clothing.

The impact on the environment:

Tazo's are collectables that are potential rubbish, landfill. Plastic is not biodegradable, so by using this potential rubbish I am minimising landfill.

Ethical considerations:

If I were to market my creations and work under the name "ECCENTRICA" I would need to register the name with Consumer Affairs.

As I am using an already existing product in my designs, such as Tazo's, permission from the company would be ethical. For example the AMEX dress by Lizzy Gardiner is owned by American Express.

This typical response from a better candidate still almost totally focuses upon the global aspects of social and environmental issues. A more local or micro-societal approach is shown by the following example.

The ethical issues that need to be addressed include an awareness of the work of other Wheelchair Lifting designers and a careful examination not to duplicate their work. Also as a result of the Easy Lifter being so effective in the way in which it lifts wheel chairs, it has prompted me to apply some form of patent on the design. This will be carried out through a patent attorney. The application document will need to include a patent request, providing details about myself as the designer, a written description and specifications of the design and a filing fee.

The easy lifter will have a positive effect on society, as it will allow people to experience more freedom throughout society. They will be able to get out of their homes and venture into the outdoors with greater ease. In doing this it will improve their quality of life.

It will also break down the barriers, as people will see wheelchair users as independent and not a burden on society, as they can more easily be looked after.

The easy lifter is well made and is designed to last. In this regard it is environmentally sound. It is made using the minimum amount of materials needed as a result of careful design. There is no waste, as parts do not need replacing, and if they do they are recyclable. Also there are no batteries used to power the lifter, which means there is no need for lead/acid production

and no excessive waste placed on the environment. However I would like to further my design by using spring mechanisms in order to help lift the wheelchair into the boot of the car.

Critical analysis of the associated ethical considerations.

A major ethical consideration for the easy lifter is the issue of patented designs and intellectual property. This point was raised by the patent attorney. He stated that there must not be any link between my design and any other wheelchair lifters on the market. But after searching the range of designs at the independent living centre and on the Internet I have found that there appears to be none. The patent office should confirm this.

Another ethical issue is the attainment of WorkCover approval of the design before installing the unit into a vehicle. Whether the design should meet all parts of the relevant safety standards before it is installed in future buyer's cars is an issue to be addressed.

General Comments

Candidates need to place more emphasis on the end result section of the specialised study. They also need to be sure to extract the most relevant information to include in the study and support this information with the raw data given, in sample form, in the appendix. Teachers will do well to support candidates in the final edit of the study to reduce excess text that will not contribute to the marking criteria.

Teachers are also well advised to be sure that candidates carry out their work independently or recognise external input into their work by citing sources more clearly. Group projects are not appropriate for either The 2 Unit major design project or the 3 Unit specialised study. Candidates and teachers must ensure that submissions are clearly the work of the candidate and that where other resources are used, they are clearly cited and receive due recognition.