NZQA

New Zealand Qualifications Authority

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The computing process - a clarification document

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Purpose

The purpose of this document is to clarify the meanings of the words used in the planning sections of the computing unit standards at levels 1-4.

The process

The process involves five stages, not all of which are required at all levels or for all types of standards. Some or all of these five stages may be integrated.

1. The task

This is the problem to be solved, the project to be completed, or the issue to be addressed by the solution that the student will provide. The teacher or workplace supervisor will almost always provide the task.

2. The brief

This is a statement giving a clear description of the desirable outcomes sought, and the constraints to be met by the solution. It contains requirements against which the project outcomes can be evaluated. The brief may either be created as part of the student's employment (in the case of workplace assessment) or in response to a set task. Read more »

3. The plan

This outlines specifically how the requirements of the brief will be realised. At levels 1 and 2, a plan may be informal, and should be created prior to beginning the task or project. As the project progresses, the plan will be annotated to show changes. For levels 3 and 4, a plan is more formal and will include milestones, resources, testing procedures, and timings for stakeholder consultations. Read more »

4. The conceptual design

This is a representation clearly indicating the appearance of the final outcome. Read more »

5. The evaluation

This ensures that the project realises the requirements stated in the brief. Evaluation should be ongoing throughout the project and include compliance with the brief, and checks for readability, legibility, presentation, and accuracy. Referencing of text and graphic sources in accordance with copyright requirements are also included as part of the evaluation process. Read more »

The brief

At levels 1 and 2, the brief will almost always be supplied to the student as part of the assessment task. In such cases, the brief should include:

- a complete description of the task to be performed, including an indication of its purpose and, where appropriate, its target audience;
- a list of requirements for the task;
- a list with the location of resources (text or graphics files, etc) that may be required to complete the task.

At level 1, the student should have a fairly comprehensive list of instructions that clearly indicates what has to be done. At level 2, it is quite appropriate for the brief to leave room for the student to have considerable creative input, and so the list of instructions or requirements can be less precise.

In both cases, the brief must contain sufficient information so that the student can be certain whether or not the requirements of the task have been met. The brief should also include the requirements for evaluation.

At levels 3 and 4 , the student is usually required to write the brief. In such cases, the task description can be much briefer, consisting perhaps only of a general description of the desired outcomes supplied by the organisation or stakeholder. This could be just a statement of the problem to be solved, or the issue to be addressed.

It is entirely appropriate at this level to require the student to develop questions to ask the organisation or stakeholder, in order to help formulate the brief. The brief would then become an outcome of negotiation between the student and the task provider. Particularly at levels 3 and 4, it may be necessary for the teacher to be involved in the negotiation in order to prevent the solution from becoming unreasonably large. In the workplace, where a more complete solution may be required, this may be one factor that determines whether the task is assessed at level 3 or level 4.

For most standards at levels 3 and 4, the student's brief is likely to include:

- a clear description of the task to be performed (or the problem to be solved, or the issue to be addressed);
- a clear description of the purpose to be achieved (which may be incorporated into the task description);
- where applicable, a statement of the target audience (which may be incorporated into the task description);
- a clear description of the intended solution. This is a broad description only; details and specifications will be included in the student's design;
- an outline of how the final solution will be evaluated against the brief (this could include testing);
- a list of any required resources. This may be software, hardware, data files, or other resources;
- a list of any stakeholders;
- a list of any constraints that might apply (time, finances, etc).

The plan

The purpose of this is to assist the student to determine exactly what has to be done, when, and in which order. A plan should be developed in conjunction with the design and the proposed evaluation process, if these are required. As these develop, they will impact on the plan. This interaction is summed up in the following diagram:
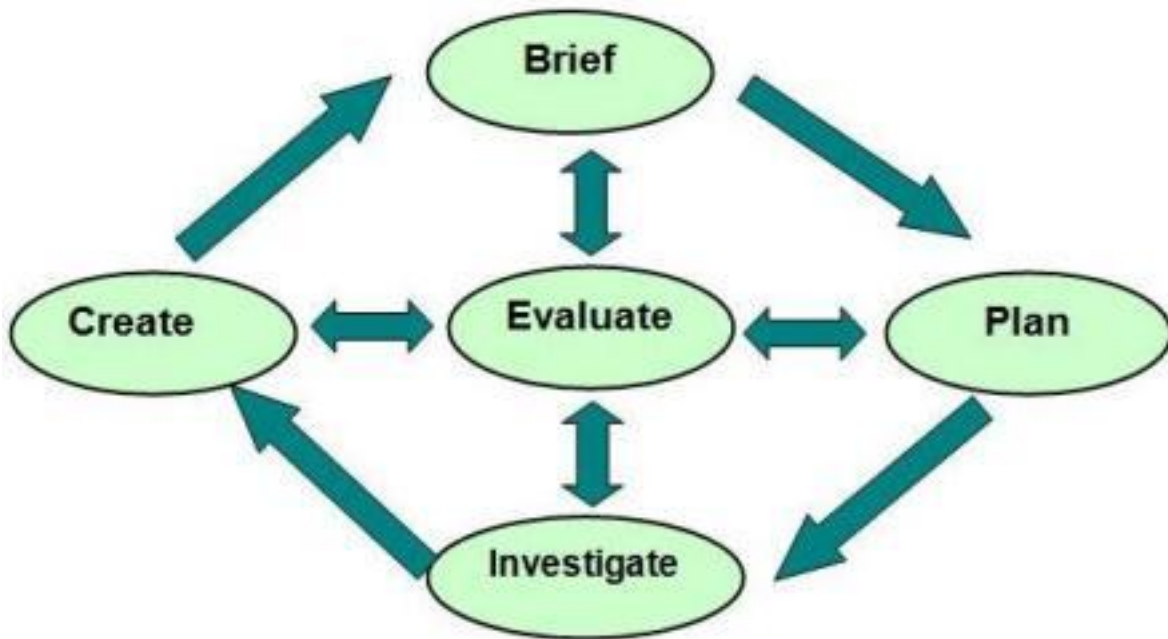
If assessors choose to assess planning orally, the result of these discussions must be documented.

The following table is presented as a guide to planning requirements at each level.

Level 1	• a list of steps to be undertaken eg milestones • resources, eg materials - hardware, software, expertise
Level 2	• a list of steps to be undertaken • the milestones • resources, eg materials, expertise (see above) • evaluation / testing procedures It *may* include: • stakeholder consultation
Level 3	• a list of steps to be undertaken • the milestones • resources, eg materials, expertise for each milestone • evaluation procedures at each milestone • stakeholder consultations at each milestone • explanation of variations • testing procedures • results of evaluation It is intended at this level that planning is 'dynamic' (refer to diagram above) produced at the beginning of the project, then annotated as the project proceeds to indicate any problems that have arisen and the procedure undertaken to solve them. This applies especially to the evaluation stage.

| Level 4 | As for Level 3, plus any recommended improvements are reported to the stakeholder. |

The conceptual design

The purpose of a conceptual design is to provide, before the project begins, a detailed description and specification of the project. A successful conceptual design should enable its reader to visualise the project in its final form and allow them to recreate the project, without having to seek clarification or further details.

A conceptual design is usually required at all levels. At levels 2, 3 and 4, the level of detail and complexity of the design will depend on the project. It is not appropriate for the student to be given step-by-step instructions to create a conceptual design. Part of the assessment at these higher levels relates to the student's ability to create their own conceptual designs.

At level 4, the tasks will be more complex and will naturally require more complex design work, although the overall process will be very similar to that used at level 3. More detail is given in the examples in the following pages.

Example of a conceptual design (PDF, 625KB).

The evaluation

'Evaluation' here is used as an umbrella term. It encompasses the following elements:

- **testing:** Does the project function as it should (that is, does it actually work)?
- **applicability:** Does the project realise all the requirements of the brief (does it solve the problem, or address the issue)?
- **checking:** Is the outcome readable and legible and of an appropriate standard of presentation; is it accurate (data integrity check, spelling check); has it an appropriate sequence of presentation, harmony, style, proportion, etc? Not all these items may be appropriate for all solutions and each unit standard will specify the level of checking required eg for web design standards, accessibility issues need to be addressed.
- **consistency:** Does it match the design, and does it result properly from the documented conceptual design?
- **documentation:** Have any differences between the outcomes and the plan or the conceptual design been appropriately recorded and explained?

It is good practice to encourage students to keep and submit documents demonstrating any modifications. These should be logically presented and annotated.

At level 1, evaluation is usually limited to a check that the outcome is consistent with the brief (and any design information given in it).

At level 2, all parts of the evaluation should be completed, but testing and consistency checks may be simple, depending on the nature of the project.

At levels 3 and 4, the increased complexity of the tasks will usually demand a more thorough evaluation process. Also, changes in the evaluation process required as the project proceeds should be documented as changes to the plan, together with the reasons for the change(s).

The evaluation section of a number of standards includes the requirement to check for 'readability', 'legibility' and 'presentation'. Assessors have sometimes confused these.

Readability refers to how easy it is to recognise the letters and words and how easy a document is to read. Many factors affect readability: eg black text on a dark background, white text on a light background, text written totally in capitals, too long a line length, headings too small, overuse of hyphenation.

Legibility refers more to character recognition than to reading blocks of text. For example, display type can be created where the individual letters are hard to recognise. The harder the letters are to recognise, the more illegible the typeface. Readable type could be arranged in such a way (for example, with letters on top of each other) so as to be illegible.

Presentation refers to the 'look' and 'feel' of a document. Is the page easy to navigate? Does the page have appropriate and consistent margins, headings, fonts?

As a general rule, a maximum of three fonts should be used. WordArt should be used sparingly. Does the document demonstrate balance, harmony, proportion, contrast, repetition, alignment and proximity? Has white space been used effectively?

Evaluation is an important part of the process, but the method of evaluation may vary depending on the nature and level of the standard, and the assessment context. However, for moderation purposes, documented evidence that evaluation, by the student, has taken place must be available. For unit standards assessing desktop publishing, this could include a draft document which has been annotated to indicate editing and proofing to ensure compliance with the brief. The final document is then printed as evidence that it meets the requirements of the brief. Other evidence may include, for example, an evaluation written by the student, a checklist completed by the student, or a verification form signed by the assessor. For Level 2 upwards, it would be expected that students would create the checklist themselves rather than having it provided.

Note on step-by-step instructions given to students

It is important that a task given to a student requires the student to supply some expertise to the completion of the task.

At level 1, it is appropriate to give step-by-step instructions. However, these could be of the form:

1 Open the file <filename here>
2 Format the heading in 24 pt Arial and centre it

They should **NOT** be of the form:

1 Click on File, then click on Open
2 Click on <filename here>
3 Highlight the heading 'text here'
  and so on - **Instructions of this nature are too simple**.

At level 2, the instructions should be even more general. They could simply be a list of steps, but without details on how each step is performed. An example could be:

1 Format the floppy disk
2 Ensure your spreadsheet is formatted appropriately and gives emphasis to important data
3 Copy the files from <location> to the floppy disk
  and so on

This does not allow a student to complete the task unless they know what they are doing.

At levels 3 and 4, only the outline of the task is given. The student is expected to create the brief, and then determine the necessary steps to implement it by themselves.

Students at levels 3 and 4 are expected to be able to create this sequence of steps, and any project design requirements, by themselves.

Level	Brief	Plan	Conceptual Design	Evaluation	User Documentation
1	Supplied e.g. Basic outline of specifications or features required for solution	Purpose Target Audience List of steps Resources	Simple Drawing of outcome **1** Formatting **2** File names **4**	Simple Does it do the job?	Not required
2	Supplied eg Simple task outline Requirements	Purpose Target Audience List of steps Milestones Resources Evaluation / testing procedures May include: Stakeholder consultation	Complete Drawing of outcome **1** Formatting **2** Content outline **3** File names **4** Basic outline of specifications or features required for solution	Complete, after the fact Refers to the brief and specifications and how they have been met (will include a final printout which clearly meets the brief and may include a checklist created by the student or verification by the assessor)	Not required
3	Student completes brief Task Outline Requirements Key factors Constraints Stakeholders	List of steps Milestones Resources Stakeholder consultations Evaluation / testing procedures Explanation of variations	Complete Drawing of outcome **1** Formatting **2** Content outline **3** File names **4** Basic outline of specifications or features	Evaluation is a dynamic process at Level 3, continuing throughout the project. Annotations will record results, changes made, and justify the	Simple user document The purpose How to access it How to use it

4	Complete as Level 3, plus: Legislative requirements **5** Costs	Level 3 requirements as above, plus: Recommended improvements to stakeholder	Complete Drawing of outcome **1** Formatting **2** Content outline **3** File names **4**	Level 3 plus: Recommended improvements to stakeholder	As for Level 3
			required for solution	reasons for modification	

1 The drawing should be sufficiently complete so as to allow the assessor to visualise the finished product.
2 Formatting should indicate text size, style, typeface and colour; also colour, texture and fill for graphics, backgrounds and enhancements.
3 A short description of the content of text blocks, to allow the assessor to visualise.
4 Filenames are required for inserted files, graphics files, hyperlinks, etc.
5 Legislation that may be relevant to the task at hand. Mention of the Act, and how it is relevant, will be sufficient.

The planning process - specific examples

The following section gives some specific examples of these items, together with a discussion of how they can be applied at each level. Some of the examples have been developed for school-based assessment, others for workplace assessment. All can be adapted for any assessment context. Other approaches are equally valid. These are samples only.

A combined brief and task - level 1 - unit standard 2792 (DOC, 57KB)

A combined brief and task - level 2 desktop publishing - unit standard 2788 (DOC, 57KB)

A brief for level 2 databases - unit standard 2786 (DOC, 58KB)

A brief for a level 3 web site - unit standards 25657 and 25658 (DOC, 55KB)

A drawing for a Level 2 conceptual design (DOC, 750KB)

A simple plan - level 2 desktop publishing – unit standard 2788 (DOC, 54KB)

An evaluation - level 3 web site - unit standard 25657 and 25658 (DOC, 54KB)

Level two assessment task - unit standard 2786 (DOC, 58KB)

Level three assessment task - unit standard 2787 (DOC, 64KB)

Level four assessment task - unit standard 18742 (DOC, 69KB)

Planning in the workplace

Those of you performing workplace assessments may find it difficult to reconcile what is required for planning within a unit standard with what actually happens 'on the job'. So, what is actually required as far as planning in the workplace goes?

Planning tends to be carried out differently in the workplace than, for example, a training establishment. In the workplace, the emphasis is normally on getting a job done within a limited period of time. Whilst full-scale written planning would be great in a perfect world, time constraints in the workplace often

mean that planning is done as part of the project outcome. Therefore, be broad-minded when you are looking at planning evidence - it may often be more appropriate to question your student orally about their planning, rather than having them provide you with written evidence.

Briefs may also be given in all sorts of contexts, from a casual suggestion in the tearoom, to discussions as parts of teams, to noticing an area that needs improvement and wanting to solve the problem. Normally the brief starts as a basic statement, e.g. "We're having a lot of problems with the spreadsheet we're using to cost out photocopying, and we'd like a better solution". The student then has to spend quite a bit of time investigating the issue/s and determining the best method to employ to provide a solution. This may involve watching tasks being carried out, asking questions to understand relevant issues better, and getting a 'feel' for the requirements that will need to be incorporated into the solution.

Generally, the more complex the task (as denoted by the level on the unit standard), the more questioning and investigation must occur before the student can provide an appropriate workplace solution. This whole 'investigation' process therefore becomes part of the brief and is likely also to merge into the planning stage. It is important that you, as the assessor, gain evidence that this process has been carried out - again, either by questioning the student orally or seeing written evidence of the data that supports investigation of the issue/s.

A scenario for three database standards at levels two, three and four has been provided above. The scenario is based within the same company; however, at each level the depth of understanding and work required is significantly different. The scenarios summarise the original 'we've identified a problem' concept, along with providing the information that would normally be identified by the student through investigation. Hopefully, this will give you an idea of what you may be looking for at the different levels.