Level 2 - Unit 1 - Product Design and Evaluation (5 credits)

Overview

Product Design and Visualisation at Level 2 requires the candidate to identify and describe some of the potential problems that might occur with their designs, as well as thinking more long term about the impact of what they make. It requires the learners to think carefully about their design and make a detailed and independent brief which shows a sound process of ideas through trials and prototypes to the completed item. They will also need to present their designs semi-professionally and be capable of evaluating their products and acting on feedback received.

A work activity will typically be 'straightforward or routine' because:

The task or context will be familiar and involve few variable aspects. The techniques used will be familiar or commonly undertaken.

Example of context – Candidates might make a name plate for their bedroom door.

Assessor's guide to interpreting the criteria

General Information

RQF general description for Level 2 qualifications

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- Achievement at RQF Level 2 (EQF Level 3) reflects the ability to select and use relevant knowledge, ideas, skills and procedures to complete well-defined tasks and address straightforward problems. It includes taking responsibility for completing tasks and procedures and exercising autonomy and judgement subject to overall direction or guidance.
- Use understanding of facts, procedures and ideas to complete well-defined tasks and address straightforward problems. Interpret relevant information and ideas. Be aware of the types of information that are relevant to the area of study or work.
- Complete well-defined generally routine tasks and address straight-forward problems. Select and use relevant skills and procedures. Identify, gather and use relevant information to inform actions. Identify how effective actions have been.
- Take responsibility for completing tasks and procedures.
- Exercise autonomy and judgement subject to overall direction or guidance.

Requirements

- Standards must be confirmed by a trained Level 2 Assessor or higher
- Assessors must at a minimum record assessment judgements as entries in the online mark book on the INGOTs.org certification site.
- Routine evidence of work used for judging assessment outcomes in the candidates' records of their day to day work will be available from their e-portfolios and online work. Assessors should ensure that relevant web pages are available to their Account Manager on request by supply of the URL.
- When the candidate provides evidence of matching all the criteria to the specification, subject to the guidance below, the assessor can request the award using the link on the certification site. The Account Manager will request a random sample of evidence from

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candidates' work that verifies the assessor's judgement.
- When the Account Manager is satisfied that the evidence is sufficient to safely make an award, the candidate's success will be confirmed and the unit certificate will be printable from the web site.
- Each unit at Level 2 has recommended 40 guided learning hours based on time required to complete by an average learner.

Assessment Method

Assessors can score each of the criteria N, L, S or H. N indicates no evidence and it is the default setting. L indicates some capability but some help still required to meet the standard. S indicates that the candidate can match the criterion to its required specification in keeping with the overall level descriptor. H indicates performance that goes beyond the expected in at least some aspects. Candidates are required to achieve at least S on all the criteria to achieve the full unit award. Once the candidate has satisfied all the criteria by demonstrating practical competence in realistic contexts they achieve the unit certificate.

Expansion of the assessment criteria

1. Relate opportunities and constraints to a product design.

1.1 I can describe opportunities for a product or solution.

Candidates should be able to make connections between the opportunities presented and the product proposal, describing them.

Evidence: Documentation in portfolios, assessor observations.

Additional information and guidance

At level 2, some market research should be evident and an ability to link research findings to the product proposal. They should be able to describe the opportunities they find and say why they think they might be important. For example, the city of Coventry has the highest number of young people in the UK, so products for this kind of market would be more successful than in cities with an aging population.

1.2 I can describe the constraints on a product or solution.

Candidates should be able to describe possible constraints on the proposed product.

Evidence: Documentation in portfolios, assessor observations.

Additional information and guidance

The candidate should be able to appreciate that any proposal will have constraints and describe the constraints and put them into simple classifications. These can include environment, cost-benefit, social/political and/or practical issues. The describe should show clear understanding that they have considered the product or solution and can see that there are some possible barriers.

1.3 I can explain commercial sustainability of a product or solution.

The candidate will explain the conditions for achieving commercial sustainability for a prototyped product and explain their conclusions.

Evidence: From portfolios, assessor observations.

Additional information and guidance

Candidates consider the conditions necessary for a commercial product. Cost of materials, cost of

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manufacture, cost of distribution and advertising. Environmental issues such as disposal and energy generation in the manufacturing process, health and safety, intellectual property. How would they go about getting a patent? Would an open source hardware route be better? At level 2 they should be able to explain themselves. Evidence of explanations could be text but audio and video is also acceptable.

2. Visualise product solutions to meet identified needs.

2.1 I can explain the key aspects in a design brief.

The candidate will be able to take a design brief and explain the key aspects in order to consider their approach.

Evidence: From portfolios, local testing, assessor observations.

Additional information and guidance

Candidates should be presented with several design briefs [1]and demonstrate the capacity to explain specific requirements that might be needed for each key aspect. At Level 2 the design briefs should be structured but with prompts such as What does it cost? Is it available? The key point of this criterion is getting candidates to focus on the priorities for research and planning demonstrating that they are reasonably self-sufficient in the process.

2.2 I can gather information to develop a solution.

The candidate will be able to gather information from several sources in order to develop their design.

Evidence: From portfolios, assessor observations.

Additional information and guidance

Candidates should be able to use the key facts identified in the design brief to consider design parameters such as shape, size, form, or constraints such as having to fit and accommodate existing or external systems, environmental impact and other factors within their own knowledge base and then use research from books, the internet and people to support their own ideas. Level 2 Candidates should document their findings and organise the information they gather largely self-sufficiently. This should include relevant details, for example, sizing, form, fit, or function, performance or user experience.

2.3 I can design and test sketches and models to visualise a solution.

The candidate will be able to create and test ideas through visual means.

Evidence: From portfolios, assessor observations.

Additional information and guidance

Candidates will produce a range of visual evidence of their approach to the problem demonstrating the evolution of their thinking. This will include for example, mind-maps [2], sketches [3], collages, computer drawings [4], and might be supplemented with written or audio supporting commentary. There should be clear evidence of how their research helped them develop their ideas beyond what they already knew themselves. At Level 2 some broad guidance and pointers will need to be given but then the candidate will achieve rich outcomes mostly self-sufficiently.

2.4 I can use appropriate digital and physical media to design a product.

The candidate will use a range of media to contribute to product design.

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Evidence: From portfolios, the visual prototype, assessor observations.

Additional information and guidance

The design tools will include software with an increasing understanding of software principles used in design and any other appropriate modelling materials such as paper, plasticine, plastic etc. Level 2 candidates will demonstrate a a broader range and variety than at Level 1.

2.5 I can prepare a visual prototype of a product.

The candidate will produce a visual prototype of a product.

Evidence: Portfolio images of the digital prototype at various stages, assessor observations.

Additional information and guidance

Candidates will produce a visual prototype through the input of information and data into suitable software and media to realise their visual prototype. This could be 2D or 3D models in CAD [5], computer based drawing and design tools. Any information and data required to create a suitable digital model of a project can be accepted as long as it clearly meets the project brief or solution. Candidates' briefs should include the need for at least one Smart technology or element that invites user and environment interaction. For example a learner could use Computer Aided Design to design the external form of a Smart weather sensor. [6] This would involve drawing on a computer and contributing documentation of simple code in an integrated development environment to design sensor functionality and feedback. At this stage it is a visual prototype and so the key priority is to be able to show sufficient detail of what the product might look like given the functional needs required from it. Project design should take into account any physical products or systems which it may need to reasonably accommodate within the project. Level 2 candidates will be increasingly self-sufficient in this process.

3. Present evaluations of designs.

3.1 I can organise evidence for presenting the design.

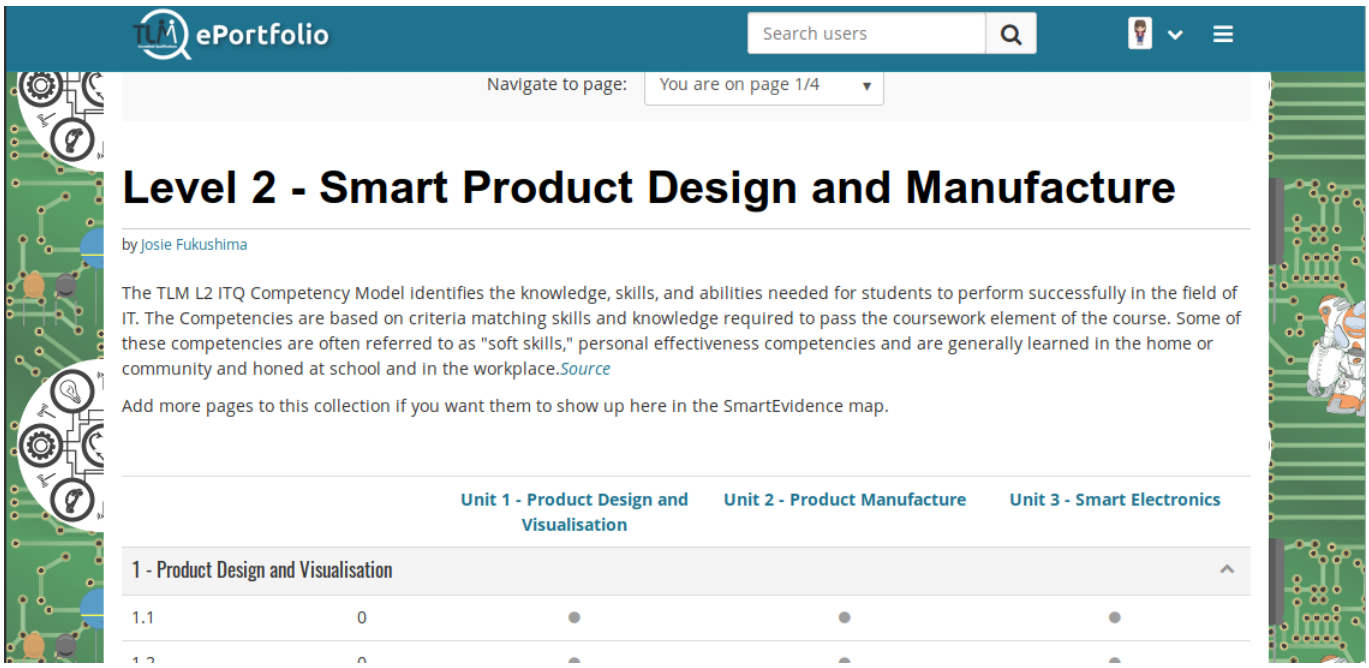
The candidate will prepare their presentation using the evidence gathered and collected in their portfolio.

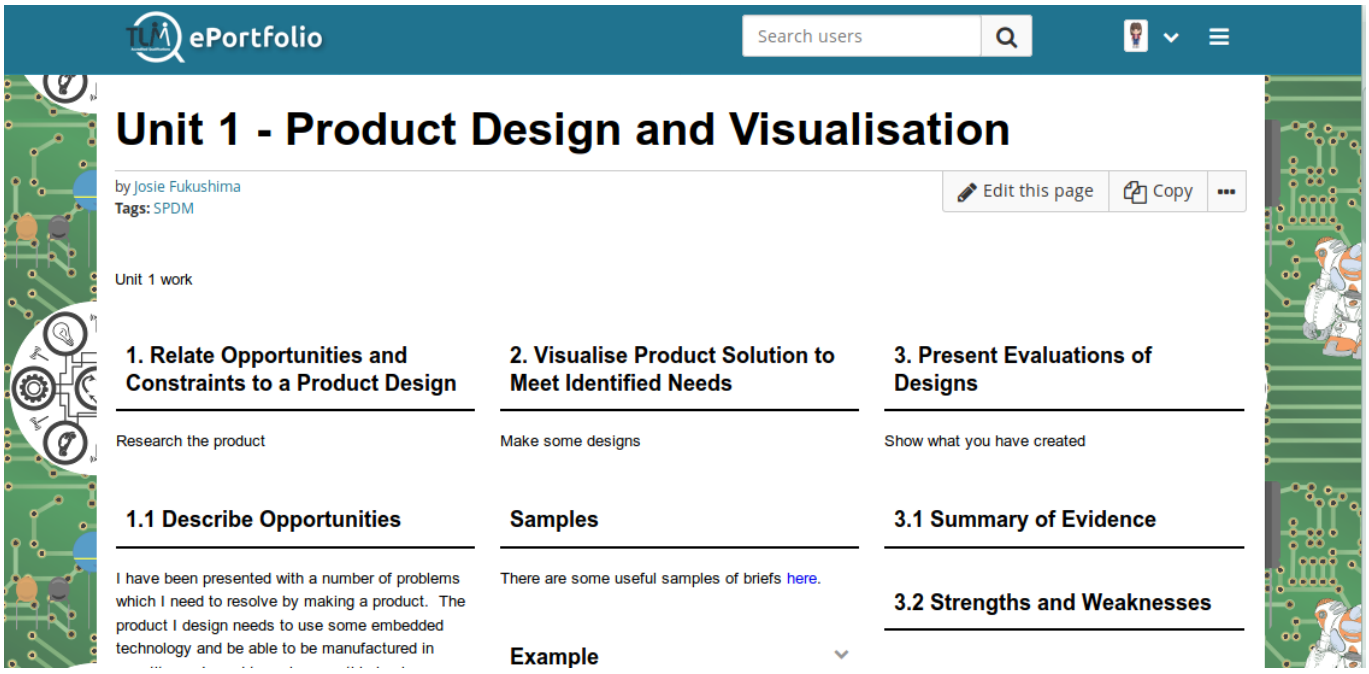
Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates will gather the information they need to make their presentation. Level 2 candidates should be able to gather and organise the information with only occasional prompts. They should prioritise what to present on its importance and work out a reasonable time schedule. TLM learners can use our pre-made templates on an ePortfolio system [7] to organise their materials.

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3.2 I can explain strengths and weaknesses in a visual prototype

The candidate should explain a range of strengths and weaknesses in the visual prototype of the design.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates should be taught to be critical of their work and to classify strengths and weaknesses both from their perspective and through peer review and asking others. They could create a questionnaire or conduct a video interview to gain the insights of others to inform their designs. At level 2 they should be able to explain the causes of strengths and weaknesses and how they affect the work.

3.3 I can use appropriate digital and/or physical models to support a presentation of the design.

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Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Level 2 candidates should produce and use visual, audio and tactile aids as appropriate to support their presentations. Designing requires candidates to understand a number of external product requirements including designing for assembly, clearances and tolerances, regulatory requirements for specific types of products or specific uses. Candidates should be aware that the first way to evaluate their final product is against the specification in the design brief and any visual prototypes should relate strongly to the brief. Their digital and physical models should be used to demonstrate this. If things have changed they should be able to say why. Being able to describe and explain them is a characteristic of Level 2.

3.4 I can receive feedback from presenting a design.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates should receive feedback graciously from any source and should consider it objectively. At level 2 control of emotions and ability to achieve a mature response to criticism even where it appears to be unjustified is expected.

3.5 I can act on feedback to improve a design.

Evidence: Portfolios, presentations, assessor observations.

Additional information and guidance

Candidates should show evidence of acting on feedback even if it is in the end to do nothing because they have considered the evidence and make a judgement that any changes will be detrimental. In most cases some changes will be needed to the design before it is used to start producing the product or in retrospect informed by the production process. These changes could be in structure, colour, functional aspects or aesthetics. At level 2 the proposed actions should be plausible for improvement and actions carried out with minimal support. Candidates should not be constrained in making improvements by assessment procedures or teaching order. All they need is to demonstrate actions on feedback that affect their designs.

Moderation/verification

The assessor should keep a record of assessment judgements made for each candidate and make notes of any significant issues for any candidate. They must be prepared to enter into dialogue with their Account Manager and provide their assessment records to the Account Manager through the online mark book. They should be prepared to provide evidence as a basis for their judgements through reference to candidate e-portfolios and any other sources eg through signed witness statements associated with the criteria matching marks in the online mark book or internal controlled testing. Before authorizing certification, the Account Manager must be satisfied that the assessors judgements are sound.

Source URL: https://theingots.org/community/spl2u1x

Links
[1] http://s.casual.pm.s3.amazonaws.com/toolkit/Samsung%20Mobile%20App%20Project%20Brief%20Sample.pdf

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[2] https://www.mindmup.com/
[3] http://alistapart.com/article/paperprototyping
[4] https://www.sketchup.com/
[5] https://www.tinkercad.com/
[6] https://projects.raspberrypi.org/en/projects/build-your-own-weather-station
[7] https://eportfolio.tlm.org.uk

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