**NZQA**

**Approved**

Achievement standard: 91054 Version 3

Standard title: Demonstrate understanding of basic human factors in design

Level: 1

Credits: 4

Resource title: A truly ergonomic café

Resource reference: Generic Technology VP-1.11 v2

Vocational pathway: Services Industries

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| Quality assurance status | These materials have been quality assured by NZQA.  NZQA Approved number A-A-02-2015-91054-02-7370 |
| Authenticity of evidence | Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material.  Using this assessment resource without modification may mean that learners’ work is not authentic. Assessors/ educators may need to change figures, measurements or data sources or set a different context or topic to be investigated or a different text to read or perform. |

Vocational Pathway Assessment Resource

Achievement standard: 91054

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Learner instructions

# Introduction

This assessment activity requires you to demonstrate understanding of basic human factors used in designing a café.

You are going to be assessed on how comprehensively you demonstrate understanding of basic human factors used in design.

The following instructions provide you with a way to structure your work so you can demonstrate what you have learnt and achieve success in this standard.

Assessor/educator note: It is expected that the assessor/educator will read the learner instructions and modify them if necessary to suit their learners.

# Task

It has been decided to open a café run by technology learners. You have the opportunity to design a layout for the café that will optimise the space available, yet also be trendy and welcoming to its customers.

Prepare a visual presentation of your café design with any associated analysis to demonstrate your understanding of basic human factors used in design. This could be a 3D model created in CAD (a computer-aided design program) or the manipulation of an existing photograph through Photoshop.

Explore a range of cafés in your local area. You could take photographs and record any evidence (Resource B) that will enable you to analyse their various layouts, customer flow, checkout procedures and use of any distinctive styles and trends.

Gather and analyse the data you may need by:

* identifying a range of techniques that can be used to gather data about human factors and used to analyse such data. How do anthropometric, psychological, and sensory data gathering inform the café design? For example, in order to analyse factors affecting café layout and function, you could look at different cafés and note factors such as customer flow, product display, customer comfort and care, sustainability over time, and amount of use
* identifying basic human factors to be considered in café design. This may include user-friendliness, comfort, adjustability, enjoyment and other positive responses, functionality, or fitness for purpose
* distinguishing between personal preferences and group preferences. How might these styles and designs impact on your café design?

Organise and document all your evidence to support any decision-making and design developments that have been considered in your café design, explain any crucial decisions.

Your presentation must include:

* discussions of why human factors need to be considered when designing café layouts, for example user-friendliness, comfort, enjoyment and other positive responses, functionality, people flow, ergonomics or fitness for purpose. For example how do human factors (ergonomic and aesthetic) impact on café design and how does your café design take these factors into account?
* explanations of how personal preference, group preference, style and trends impact on café layout designs and in particular your café design
* discussions about the suitability of data gathering and analysis techniques that may be used in designing café layouts. For example, what kinds of information do these different techniques provide about the human factors being considered when designing cafés? Compare and contrast the advantages of specific data gathering techniques (anthropometric, psychological and sensory) to inform your own café design.

Find relevant information of how human factors are used in café design by:

* visiting your local library or council, cafés and supermarkets
* researching websites and books (Resource A)
* accessing a computer with CAD and design software (e.g. Vectorworks, Google SketchUp, Adobe Photoshop).

# Resource A

Woodson, W, Tillman, B and Tillman, P 1992, *Human Factors Design Handbook*, McGraw-Hill Education.

Building layout template:

<http://www.smartdraw.com/specials/officeplanning.asp>

Ergonomics:

<http://designmuseum.org/design/page75806>

# Resource B

This is an example of a sensory data gathering technique based on learner observations.

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| **Cafés** | **Ergonomic factors** | **Aesthetic factors** | **Styles and trends** | **Data result** |
| Café 1 | Efficiency and safety are considered in the layout by having wide-open spaces between tables and counter to guide customer movement. | Very neutral in appearance (e.g. wood and chrome), café’s look is same throughout the chain so can be boring.  Keeping to a brand standard limits materials, colours and finishes. Lighting is bright/artificial but has outdoor seating also. | Standardised style overall (e.g. colour, materials) but components can be changed to suit different cafés’ requirements, limited trends. Looks inexpensive but friendly. No clutter, visual displays encourage impulse purchases. | These chain cafés are designed to specific requirements so they are functional but have limited viability in their look. Their aim is for a place of conversation and a sense of community |
| Café 2 | The café’s overall trend e.g. large comfortable chairs to encourage customers to relax have comprised customer flow. Checkout is at entrance. | Makes use of layout and any unusual components available.  Looks good, personal enjoyment.  Food displayed to encourage impulse purchases. Good use of natural lighting. | Café owners’ preferences come through based on personal style and current trends e.g. re-use of components such as recycled countertops, chairs and taking advantage of the brick walls. | Small trendy café, which has an eclectic style, friendly yet still maintains overall functionality. Encourages customers to stay and relax in comfort. |

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Assessor/Educator guidelines

# Introduction

The following guidelines are supplied to enable assessors/educators to carry out valid and consistent assessment using this internal assessment resource.

As with all assessment resources, education providers will need to follow their own quality control processes. Assessors/educators must manage authenticity for any assessment from a public source, because learners may have access to the assessment schedule or exemplar material. Using this assessment resource without modification may mean that learners' work is not authentic. The assessor/educator may need to change figures, measurements or data sources or set a different context or topic. Assessors/educators need to consider the local context in which learning is taking place and its relevance for learners.

Assessors/educators need to be very familiar with the outcome being assessed by the achievement standard. The achievement criteria and the explanatory notes contain information, definitions, and requirements that are crucial when interpreting the standard and assessing learners against it.

# Context/setting

This activity requires learners to demonstrate comprehensive understanding of basic human factors used in the design of a café.

# Conditions

This is an individual activity. Learners could work individually or in groups to look at ergonomic and aesthetic factors to understand what is meant by the terms personal preference, group preference, style, and trends and how these affect different design tasks. Decide on the format of the final presentation. You may wish to take learner preferences into account in deciding on the format.

# Resource requirements

Learners require internet access for research.

# Additional information

None.

## Other possible contexts for this vocational pathway

Environmental architecture: learners could consider and discuss spatial design, for example shopping centre design, and internet shopping sites.

# Assessment schedule: Generic Technology 91054 – A truly ergonomic café

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| Evidence/Judgements for Achievement | Evidence/Judgements for Achievement with Merit | Evidence/Judgements for Achievement with Excellence |
| The learner demonstrates understanding of basic human factors used in a café layout design by:   * describing human factors that need to be considered when designing a café layout   For example:  The learner describes people’s physical attributes as well as the way people feel, think, and behave. The learner’s description may include customer flow as human factors of café design. The layout and positioning of the counter is important to guide the flow of customer movement. The learner has manipulated a photograph (in Photoshop), adding aesthetic and ergonomic factors that need to be considered, and annotations describing how this design will allow a large number of people to use it successfully.   * explaining how personal preference, group preferences, style and trends may impact on café layout design   For example:  The learner explains the requirements of a specific individual or user group (e.g. in terms of the human factors that need to be considered when designing a café for learners). The learner also explains how styles and trends may be linked, for example that by including existing features of the space available this could contribute towards the café’s evolving style without compromising its function.   * describing data gathering and analysis techniques that may be used in planning café layout design, such as how each technique is carried out (how the information is collected and analysed) and how it then informs the café design   For example:  The learner identifies observation as one useful data gathering technique for café design. The description includes the learner’s observations of different cafés in the local area, noticing layouts based on the environment, how much space was available for customer movement, and how important the physical surroundings and existing features were. By noticing the amount of use, lighting and noise, the learner was also able to provide further details of successful interior layouts and any adjustments that could be made to ensure ease of use for their café design.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates in-depth understanding of basic human factors used in a café layout design by:   * explaining the human factors that need to be considered when designing a café layout   For example:  The learner explains people’s physical attributes as well as the way people feel, think, and behave. The learner’s explanation may include customer flow as human factors of café design. The layout and positioning of the counter is important to guide the flow of customer movement. The learner has manipulated a photograph (in Photoshop), adding aesthetic and ergonomic factors that need to be considered, and annotations explaining how this design will allow a large amount of people to use it successfully. The learner explains that it is important for the café to maintain a balance between safety of the intended users, maximising potential seating (turnover) and a welcoming atmosphere. For example a wide space between tables minimises overcrowding but takes more space and therefore you can’t seat as many people. The overall atmosphere of the environment needs to be aesthetically pleasing and encourage people into the café. The learner goes on to explain the physical surroundings and existing features of the available space and gives details of how the café design takes these into consideration.   * explaining how personal preference, group preferences, style and trends may impact on café layout design   For example:  The learner explains the requirements of a specific individual or user group (e.g. in terms of the human factors that need to be considered when designing a café for learners). The learner also explains how styles and trends may be linked, for example that by including existing features of the space available this could contribute towards the café’s evolving style without compromising its function.   * explaining data gathering and analysis techniques that may be used in planning café layout design, such as how each technique is carried out (how the information is collected and analysed) and how it then informs the café design   For example:  The learner explains how observation is one useful data gathering technique for café design. The description includes the learner’s observations of different cafés in the local area, noticing layouts based on the environment, how much space was available for customer movement, and how important the physical surroundings and existing features were. By noticing the amount of use, lighting and noise, the learner was also able to provide further details of successful interior layouts and any adjustments that could be made to ensure ease of use for their café design. Further explanations include how anthropometric data could be used to determine seating and counter height and position, and how this type of measurement can be collected into a database which becomes a useful designer’s tool, giving standardised measurements for groups of the population; how space and flow is optimised through using the use of anthropometric data, to gain maximum customer movement and yet still provide comfort.  *The above expected learner responses are indicative only and relate to just part of what is required.* | The learner demonstrates comprehensive understanding of basic human factors used in a café layout design by:   * discussing why human factors identified for designing café layouts need to be considered   For example:  The learner compares and contrasts how designing a café differs from designing a clothing store or how designing a café for one environment (e.g. a school) differs from designing a café for another environment (e.g. a shopping centre).   * explaining how personal preference, group preferences, style and trends may impact on café layout design   For example:  The learner explains the requirements of a specific individual or user group (e.g. in terms of the human factors that need to be considered when designing a café for learners). The learner also explains how styles and trends may be linked, for example that by including existing features of the space available this could contribute towards the café’s evolving style without compromising its function.   * discussing the suitability of data gathering and analysis techniques that may be used in designing a café layout   For example:  The learner discusses relevance of existing data with reference to their café design. The discussion identifies and compares the advantages and disadvantages of data gathering techniques and analysis techniques and gives examples of the useful information they may provide in café design.  The learner discusses the advantages and disadvantages of customer feedback and compares these with the advantages and disadvantages of observation in order to decide which of these techniques may provide better qualitative data for their specific purpose. The learner also discusses the advantages and disadvantages of design aesthetics (e.g. balance between new and old) that involves comparing existing features already in the available space (e.g. blackboard, brick walls, carpeted floors) to possible new materials (e.g. recycled rubber as a floor surface) to decide if they should be incorporated into the design. The learner discusses how the information is collected and analysed and how it then informs their café design, for example the use of databases as a tool for analysis, how these are created and why they are useful in café layout design; how information such as sensory testing and evaluation and historical information may also indicate the ideal placement of product, to maximise sales potential.  *The above expected learner responses are indicative only and relate to just part of what is required.* |

Final grades will be decided using professional judgement based on an examination of the evidence provided against the criteria in the Achievement Standard. Judgements should be holistic, rather than based on a checklist approach.