

## Unit 10: Human Computer Interaction

**Unit code:** A/601/0457

**QCF Level 4:** BTEC Higher National

**Credit value:** 15

---

- **Aim**

This unit aims to give learners an understanding of recent Human Computer Interaction (HCI) developments and will enable them to develop a human computer interface.

- **Unit abstract**

As technology moves forward, new methods of communicating with computer systems are becoming possible. Developers need to make reasoned choices as to the nature and appropriateness of the interface they are developing or using, in order to ensure that the user interaction is as natural, efficient and effective as possible. This requires a good understanding of the essentials of HCI and of the latest developments. A long-term goal of HCI is to design systems that minimise barriers between the human's cognitive model of what they want to do and the computer's understanding of the user's intent.

Learners will be encouraged to explore the detail of how users interact with software, how the interface works to help fulfil the user needs and how it makes allowances for different users. Learners will develop a critical appreciation of the advantages and disadvantages of various interfaces currently available and develop an HCI using an appropriate programming language or software tool.

- **Learning outcomes**

**On successful completion of this unit a learner will:**

- 1 Understand recent human computer interaction related developments and their application
- 2 Understand the issues related to a chosen human computer interface
- 3 Be able to develop a human computer interface.

## Unit content

---

### 1 Understand recent human computer interaction related developments and their application

*HCI:* historical development; motivation; techniques; guidelines; principles; standards.

*Developments in technology:* changing workstation environments eg screens, keyboards, pointing devices; other non standard input/output devices eg speech recognition; related processing developments and information storage possibilities

*Developments in HCI:* examples eg virtual machines with command line input, graphical interfaces, screen design for intensive data entry; intelligent HCIs; virtual personas; changing concepts of 'look and feel'

*User issues:* range of users eg expert, regular, occasional, novice, special needs; ergonomics; human information processing; impact on the workplace

*Development of systems:* new developments eg event-driven systems, use of multimedia; modelling techniques; implication of new developments on user interfaces; implication of developments on hardware eg storage, processing requirements; convergence of systems

*Applications:* selection of HCIs eg touchscreen, voice activated

### 2 Understand the issues related to a chosen human computer interface

*User characteristics:* human memory: knowledge representation; perception; attention; reasoning; communication; skills and skills acquisition; user's cognitive model; use of metaphors and the consequences on the design of HCI

*Health and safety considerations:* ergonomics and the surrounding environment eg lighting, seating; specific concerns eg Repetitive Strain Injury (RSI); legal implications

*Wider considerations:* costs; training; system requirements eg hardware, software, communications; information storage; health and safety

### 3 Be able to develop a human computer interface

*Modelling the interface:* mapping the system functionality to the conceptual model; grouping of the tasks into logical sets

*Analysis:* task analysis; user-centred methodologies eg storyboarding, user needs analysis; HCI options; usability objectives eg performance or response requirements

*Design:* rules and heuristics for HCI design; review of proprietary examples; supporting information eg context sensitive help, online help/documentation; design tools; design principles eg tolerance, simplicity, consistency, provision of feedback.

*Production:* selection of tools; production of interface; testing

*Evaluating an HCI:* functionality characteristics eg keystroke effort per task; ability to navigate within the system; ability to configure the HCI; user satisfaction against requirements; use of quality metrics eg Fitt's Law, Keystroke Level Method; test documentation

## Learning outcomes and assessment criteria

<b>Learning outcomes</b>  <b>On successful completion of this unit a learner will:</b>	<b>Assessment criteria for pass</b>  <b>The learner can:</b>
LO1  Understand recent human computer interaction related developments and their application	1.1 evaluate recent HCI related developments and their applications  1.2 discuss the impact of HCI in the workplace
LO2  Understand the issues related to a chosen human computer interface	2.1 discuss the issues related to user characteristics for a chosen HCI
LO3  Be able to develop a human computer interface	3.1 design and create a human computer interface for a specified application  3.2 explain the principles that have been applied to the design  3.3 critically review and test an interface  3.4 analyse actual test results against expected results to identify discrepancies  3.5 evaluate independent feedback and make recommendations for improvements  3.6 create onscreen help to assist the users of an interface  3.7 create documentation for the support and maintenance of an interface.

## Guidance

### Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

The learning outcomes associated with this unit are closely linked with:

Level 3	Level 4	Level 5
Unit 23: Human Computer Interaction	Unit 11: Digital Media in Art and Design	Unit 37: Digital Image Creation and Development
	Unit 12: 2D, 3D, and Time-based Digital Applications	Unit 38: 3D Computer Modelling and Animation
	Unit 13: Multimedia Design and Authoring	
	Unit 14: Website Design	

This unit has links to the Level 4 and Level 5 National Occupational Standards for IT and Telecoms Professionals, particularly the areas of competence of:

- Human Computer Interaction/Interface (HCI) Design.

### Essential requirements

Learners must have access to a cross-section of applications on differing platforms presenting a range of HCI. Learners should also have access to a development environment that allows rapid prototyping.

This unit must be a balance between theory and practical experience. Learners must be exposed to a range of HCIs as possible, and be encouraged to criticise them. Where possible, tools for developing software prototypes must be used to allow the rapid production of HCIs. The design of the HCI must be seen as an integral part of the software development process.

Evidence can be obtained from investigating a wide range of HCI applications. Learners must show that they are capable of identifying the main features of a given HCI, that they can diagnose the failings of the interface and propose improvements in the light of user needs.

## Resources

### Books

Benyon D – *Designing Interactive Systems: A Comprehensive Guide to HCI and Interaction Design* (Addison Welsley, 2010) ISBN 0321435338

Sharp H, Rogers Y and Preece J – *Interaction Design: Beyond Human-computer Interaction* (Wiley, 2007) ISBN 0470018666

### Website

<http://hcibib.org/>

## Employer engagement and vocational contexts

Where learners are employed, a project-based assessment would enhance the delivery of this unit. Also, practical demonstrations of HCI, illustrated by speakers from commerce and industry, and of group visits to relevant organisations would contextualize the unit and be of value.