LOCATION: NPTC NEATH | **LLEOLIAD: NPTC NEATH**

LEVEL 6 | **LEFEL 6**

EXAMINATION PERIOD MAY 2021 | **CYFNOD ARHOLIADAU MAI 2021**

MODULE CODE: ACCA6017 Usability Engineering

TIME: 2 HOURS

ANSWER ALL QUESTIONS

Equipment or materials required

Adnoddau neu ddefnyddiau sydd eu hangen –

The questions relate to the Techniques Science Centre case study issued previously. A clean copy of the case study is provided.

This is an OPEN-BOOK examination; you may bring into the examination room notes prepared on SIX sides of A4 paper only.

The Candidates are not permitted to bring dictionaries or text books/case studies into the exam room.

ANSWER ALL QUESTIONS

QUESTION ONE

a) Present your comparison of two interactive displays you selected from the National Waterfront Museum, Swansea. Compare the application of human factors to the two designs, including human vision, hearing and touch, metaphor and affordance in your analysis.

(30 marks)

b) Give your recommendations for improving the user experience in the less effective of the two interactive displays. Include analysis of the relevance of the application of human factors research from the area of computer system design to the design of interactive displays.

(20 marks)

QUESTION TWO

a) Give your recommended interface evaluation strategy for examples of interactive exhibits at the National Waterfront Museum. Include reference to examples of evaluation studies from the research literature and assess their relevance to the evaluation of the exhibits.

(30 marks)

b) Give your recommendations for an interface evaluation strategy for an augmented reality application running on visitors' phones to enable users to interact with exhibits. How does this differ from your recommendations for the evaluation of static exhibits and why?

(20 marks)

QUESTION THREE

a) Propose one Virtual Reality (VR) and one Augmented Reality (AR) exhibit for the National Waterfront Museum helping in the presentation and understanding of an aspect of science and technology. Give an outline of the hardware and software design, including rough sketches, and explain your application of usability theory in the development of the designs as well as any research and industry systems you applied to this task. Assess the effectiveness of your two designs in aiding appreciation of the aspects of science and technology they are designed to communicate.

(30 marks)

b) Analyse the extent to which VR and AR systems today, such as your suggested designs, are able to fulfil the vision of researchers such as Sutherland and Brooks. Include your analysis of the difference between VR and AR in your exhibit designs.

(20 marks)

Case Study for Usability Engineering Examination: May 2021

Background

The National Waterfront Museum in Swansea opened in 2005. The museum uses "interactive technology married with traditional displays" [1] to showcase Welsh industrial history.

Usability Review of two Interactive Displays

- Select one interactive display from the museum you consider to be an effective design and another display you consider to be less effective.
- Give an overview of the displays, including rough sketches. Outline the information and concepts they are communicating.
- Prepare a comparison of the two including the following topics as well as any other usability topics you consider relevant:
  - Human vision, hearing and touch
  - Metaphor
  - Affordance

How helpful is it to apply usability applied to the design of general computer systems to these interactive museum exhibits?

Interface Evaluation

Produce a recommended interface evaluation strategy for examples of interactive exhibits at the Waterfront Museum.

Produce an evaluation strategy for an augmented reality application running on visitors' phones to enable users to interact with museum exhibits.

Include reference to interface evaluation studies form the literature to justify the two evaluation strategies.

Guidelines and Accessibility

Analyse the application of usability and accessibility guidelines examples from the Waterfront Museum systems.

Apply a set of general usability guidelines, such as Dix's. Which guidelines are applicable to the museum exhibits and which are not?

Draw up a set of recommendations for accessibility to interactive museum exhibits such as those at the Waterfront Museum. To what extent does accessibility advice aimed at web designers (such as the W3C Web Accessibility Initiative) apply to designers of interactive museum exhibits?

Virtual and Augmented Reality

Analyse the background of Virtual Reality (VR) systems, including Sutherland's vision for the development of VR systems and associated hardware. To what extent do Augmented Reality (AR) systems share the same desired characteristics, such as user immersion?

Propose one VR and one AR exhibit for the Waterfront museum helping in the presentation and understanding of an aspect of Welsh industrial heritage. Give an outline of the hardware and software design, including rough sketches. Use examples of existing VR and AR designs to develop your ideas.