



School of Computer Science

Time Constrained Assessment - Practice

Module Code	CMP2805M
Module Title	User Experience Design
Module Coordinator	Dr. Khaled Bachour
Duration of Assessment	1 hour 55 minutes
Date	24 th April 2020
Release Time	-
Submission Time	-
Total Wordlimit	None

General Instructions to Candidates.

1. You **must** submit your answers as a MS Word Document to Turnitin on Blackboard **before** the submission time: failure to do so will be classified as misconduct in examinations. We strongly recommend you submit 15 minutes prior to the deadline.
2. You **must** also send a copy of your work to the socssubmissions@lincoln.ac.uk at the same time. You must place the Module Code and your Student Id in the Subject Field of the Mail.
3. Hand-written notes or diagrams, **must** be photographed and inserted into the Word Document as an image.
4. This assessment is an open resource format: you may use online resources, lecture and seminar notes, text books and journals.
5. All work will be subject to plagiarism and academic integrity checks. In submitting your assessment you are claiming that it is your own original work; if standard checks suggest otherwise, Academic Misconduct Regulations will be applied.
6. The duration of the Time Constrained Assessment will vary for those students with Learning Support Plans. Extensions do not apply, but Extenuating Circumstances can be applied for in the normal way.

Module Specific Instructions to Candidates:

1. You are free to use a calculator as needed.
2. Show your working where possible.
3. For calculations, you may do this on paper and include a photograph of your workings.
4. You may also use freehand notations for formulas e.g.:
 - a. **Sqrt(x)** for the square root of x.
 - b. **Sum(x)** for the sum of all values of x.

Answer all of the following questions:

1. Usability. [20 marks]

Feedback and *Affordances* are examples of Norman's Design Principles for good usability. For each of those give an example of how a system can fail to provide good usability by not observing these principles, and an example of how a system can achieve good usability by observing them. [5 marks for each correct example].

Answer here:

2. Accessibility. [20 marks]

(a) [10 marks] Colour-Vision Deficiency (CVD) is an impairment that prevents some users from seeing colours correctly. Give two examples of **different** ways in which a system can be designed to support users with CVD [5 marks for each example].

Answer here:

(b) [10 marks] Consider the following technologies, and for each determine if it is an example of Assistive Technology or Accessible Design. Explain your answer. (10 marks).

- i. A car seat with adjustable height.

Answer here:

- ii. Netflix shows with subtitles included.

Answer here:

3. Research Ethics. [20 marks]

Consider the following methods for determining the average waiting time at a local bus stop as part of a university research project.. For each, determine if a study using this method should be subject to Ethical Research Principles and explain in one or two sentences why or why not.

- a. Observe people on a bus stop. Mentally count the seconds to estimate the time a person has waited at the stop. Record that time. Repeat as needed choosing a different person at random. Then compute the average of all recorded times. [5 marks]

Answer here:

- b. Observe people on a bus stop while holding a stopwatch. Measure the time a person waits at the stop. Record that time. Repeat as needed choosing a different person at random. Then compute the average of all recorded times. [5 marks]

Answer here:

- c. Film a bus stop for several hours. Then use the footage to measure the time each person has had to wait. Then compute the average of the measured times. [5 marks]

Answer here:

- d. Put up a sign at the bus stop that asks people to measure their own waiting time and then send a text message with their value in seconds to a specified number. Collate responses then compute the average. [5 marks]

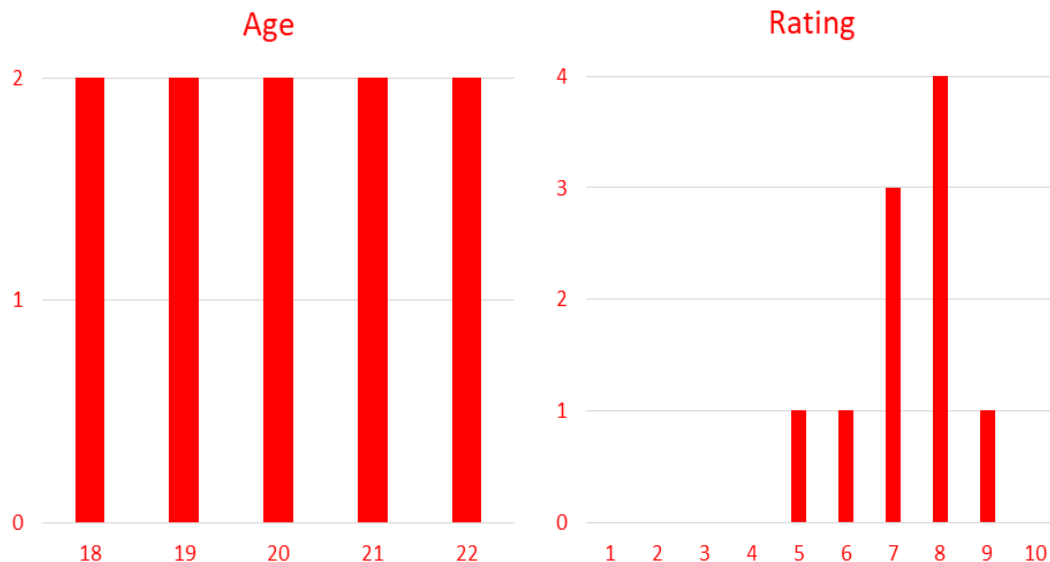
Answer here:

4. Data Analysis. [40 marks]

- (a) [20 marks] A study is carried out gathering users' opinions of a new website. Ten people were asked to give an overall rating of between 1 (lowest) and 10 (highest) after a brief interaction. In addition they each completed a System Usability Scale questionnaire (SUS). The results are as follows:

Person ID	1	2	3	4	5	6	7	8	9	10
Age	22	19	18	20	18	19	21	21	22	20
Rating	8	8	9	7	7	8	7	8	6	5
SUS	85	70	70	76	72	75	80	74	78	70

1. Below are the distribution graph for the Age and Rating. Name the distributions. [4 marks]



Answer here:

2. Given that the arithmetic mean Rating is 7.3 and of SUS is 75, calculate the standard deviation of both Rating and SUS scores. Show your working. [6 marks]

Answer here:

3. Given the distribution of Ratings and SUS scores in the results, what would you conclude about the new website? What would you need for a more definitive conclusion? [3 marks]

Answer here:

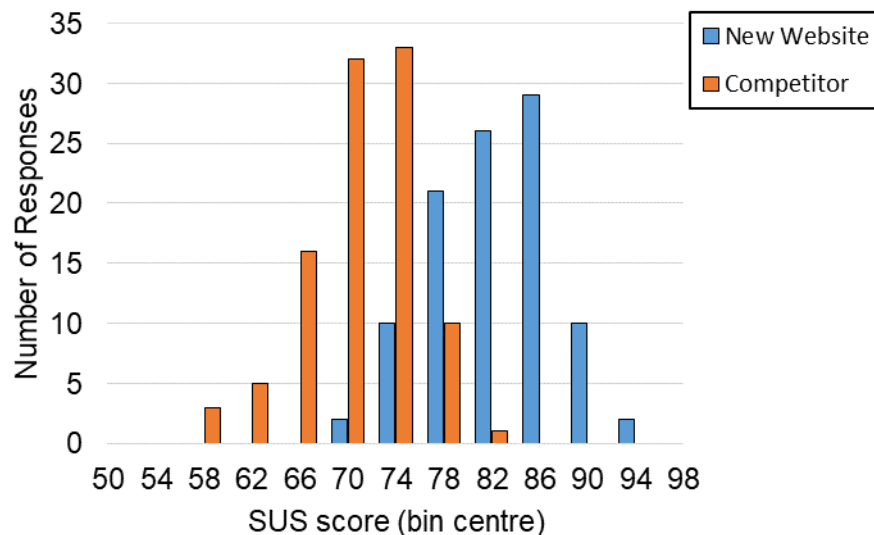
4. There is a correlation of $r = +0.822$ between the Age and SUS score. What could this mean? What can you do to understand that further? [4 marks]

Answer here:

5. Suppose this website is for a care home for the elderly. What problem can you point out with data that was collected that would jeopardize our ability to evaluate its usability from that data? [3 marks]

Answer here:

- (b) [20 marks] A new study is carried out to compare completing a specific task on the previous question's website ('new website') - with completing the same task on a competitor's website ('competitor's website'). One hundred people are asked to evaluate the new website, and one hundred people are asked to evaluate the competitor's website. All participants fill in the SUS questionnaire, with the following results:



New website Mean: 80.73 (Standard Deviation.: 5.04)

Competitor website Mean: 69.3 (Standard Deviation: 4.81)

1. We want to know whether the new website is better than the competitor's website, and so want to perform a **significance test**. Given the data in the graph above, **what test** would be appropriate for this, and **why**? [4 marks]

Answer here:

2. What is the "**null hypothesis**" for this significance test? [2 marks]

Answer here:

3. Using this test, we obtain a **p-value of 0.001**. What does this mean in terms of significance (i.e. is it a significant result)? [2 marks]

Answer here:

4. Mention and discuss **two** limitations of only using p-values to interpret the results? [6 marks]

Answer here:

5. Calculate the **effect size (Cohen's d)** between the two sets of data. [4 marks]

Answer here:

6. The **95% Confidence Interval** of the difference of means for this data is **(10.06, 12.9)**. What does this mean? [2 marks]

Answer here: