## 

# LIMERICK INSTITUTE OF TECHNOLOGY

**SUMMER** **EXAMINATIONS** **2019/2020**

**MODULE:** MULT08022-Human Factors

### PROGRAMME(S):

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| LC\_KMMPD\_LMY | Higher Diploma in Science Creative Multimedia Programming |
| LC\_KISYM\_KMY | Bachelor of Science (Honours) Internet Systems Development |
| LC\_KISYA\_KMY | Bachelor of Science (Honours) Internet Systems Development |
| LC\_KIDMM\_KMY | Bachelor of Science (Honours) Interactive Digital Media |
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**YEAR OF STUDY:** 4,5

**EXAMINER(S):**

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# Answer to Question

**1**

**A**

**(i)**

Watson proposed a cause and effect relationships. In the experimental method researchers identify and define variable then formulate a hypothesis followed by manipulating the variables and then collecting the data and results. He stated that psychologists no longer study the mind, which cannot be observed and that they only study behaviour as it can be observed.

Before this the mind was studied using introspection but these were not as useful as the mental mind is private and cannot be confirmed.

**(ii)**

Behaviourism uses positive and negative reinforcements to record a change in behaviour and also operand conditioning. Behaviourists studied what had happened to a person in the past the present environmental conditions, the reaction of the person. They also assumed that all behaviour of a person is dependant on the persons learning history and stimuli.

Cognitive theories also investigated the developments made by behaviourist theories but focused their attention to the mind and referred to behaviourist theories as simple.

The difference between the two theories is that behaviourism is more about explaining things from a person’s outward behaviour or observable action and ignore the mental model of processing information while cognitivism is based around cognitive processes like decision making and memory. Cognitivism also try to describe how the mind processes information and teach bigger chunks of material than the behaviourists. Also both theories expect different outcomes

What both theories have in common is they both use either a stimulus or information processing to achieve the same result.

**B**

Latent learning is something that does not become visible the first time the person learns it but then can reappear later due to motivation or a particular circumstance.

Cognitive maps are an internal image created in the mind of an external environment

The main experiment which led to the discovery of Tolman’s theories was experiment with rats and mazes. In this experiment Tolman wanted to show that rats could make decisions on direction based on knowledge of their environment and not because of reward. He used 3 groups of rats, one that were rewarded, one that was given a delayed reward and one that received no reward. The results from that experiment where that the first group had learned the direction to take in the maze quicker than the other groups but from day 11-17 their speed became consistent. The second group took longer to learn the maze but on day 11 they became faster due to receiving a reward. The third group was the slowest overall due to the fact they did not receive any reward.

**C**

Skinners operant conditioning is a way of learning through rewards and punishments. The components of this theory are reinforcement and punishment. Both of these components can be positive and negative

An example of positive reinforcement in user interfaces would be a reward for completing a task on a website e.g. user receives a virtual badge for completing a quiz

An example of negative reinforcement in user interfaces would holding back a reward for completing a task on a website so that the user can try again to receive a better score e.g. user receives a virtual badge for completing a quiz but it is taken away until the user receives a higher score.

An example of a positive punishment in a user interface is that say for example a user cannot complete a task would be given a warning as to the consequences if they cannot complete the task.

An example of a negative punishment in a user interface is that say for example a user cannot complete a task they would be restricted from navigating through the entire website and limited to a certain number of pages or given a cool down period where they are not allowed use the site.

**D**

Pragnaz is a German word for pithiness, and it is a principal in gestalts theories and can be seen in his laws of continuity and closure as the human mind tends to create complete shapes.

**2**

**A**

**(i)**

Sensory memory’s purpose is to retain short term memory after the original stimulus has ended e.g. smell, sound.

Short term memories purpose is to store information for a short period of time. During this stage information is stored in either the short-term memory or long-term memory depending on how important the information is.

The purpose of long-term memory is the subconscious storing of information so that it can be used at a later time.

**(ii)**

Sensory memory – information is passed from sensory to short term by the process of attention, which filters the stimuli that are of interest. It is an automatic response and comes from external stimuli. Sensory memory is very short (less than 1/2 second for vision, about 3 seconds for hearing). In order for sensory memory to be processed the learner must be paying attention or it will be forgotten.

Short term memory – information from sensory memory is stored in the short-term memory. Short term memory lasts between 15 to 20 seconds. Memories can be kept in the short-term memory by repeating the memory e.g. repeating words aloud. Short term memory can hold between 5 -9 items of information. The main methods of getting short term memory to be stored from sensory is organisation, repetition, and learning.

Long term memory – long term memory is unlimited and is stored from the short-term memory by elaboration such as rhyming, mnemonic etc.., information is then organised into declarative and procedural knowledge as well as imagery.

**(iii)**

In college we can prepare for an exam by paying attention to the task at had i.e. paying attention to the notes etc as this will transfer information from the sensory to short term memory. By repeating notes using rhyming or creating a mnemonic can help store notes into the short-term memory. By elaborating on these notes, we can then store the information into the long-term memory so it can be retrieved on the day of the exam.

**B**

Phonology is the study of the sounds of language and their patterns. For example, you can tell how a person is feeling by their tone of voice e.g. happy or sad

Morphology is how words are built. For example, adding an s to the word dog creates a plural of dogs, another example would be fire house as it has two different words with different meanings but together mean something else.

Syntax is how words combine to form sentences, for example I jumped happily, I happily jumped etc all have the same meaning but use different syntax to make the information more interesting etc.

**C**

The main difference between the two models is that the stage approach deals with the placement into memory while the levels of processing model involves the retrieval of information from memory. In the stage theory information is processed and stored in 3 stages, sensory, short term, and long-term memory. The stage theory relies on attention in order for information to be passes to each stage.

The levels of processing model however states that all stimuli that activate a sensory receptor are permanently stored in memory and information is more easily retrieved if elaboration is used. It states that information is more likely to be stored if the teaching method used to learn to topic is similar to that of the question.

**3**

**A**

**(i)**

This theory suggests that learning takes place when a student is in their Zone of proximal development. It is the difference between what a learner can do without help and what he or she can do with help. The result of this that a leaner follows a teacher’s example and gradually develops the ability to do certain tasks without help or assistance. The main aim of this theory is that the role of education to be to provide the learner with experiences which are in their ZPD, thereby encouraging and advancing their individual learning.

In college ZPD is used for example when a lecturer gives an assignment. This assignment could not be completed if the student were not in their ZPD and did not have previous help from a lecturer when completing practical’s that give them the experience to complete the assignment.

**(ii)**

Scaffolding involves providing a student with support when they are learning. This support is then reduced when the student becomes comfortable with the task and takes responsibility for their own learning. For example in programming the lecturer might preview a piece of code and discuss the methods and variables in that code, then the students could be given a problem which uses this code where they can ask for help if needed but the have been thought the main pieces of information needed to complete the task.

**B**

Heuristic evaluation was developed by Nielsen and helps find usability problems in user interface designs. The procedure for a heuristic evaluation is usually one or a number of usability experts evaluate the user interface of a product (for example a website) against a set of Heuristic Principles and note areas that do not apply. These results are then combined and independently rated on the severity of the heuristic. The main goal of heuristic evaluations is to identify any problems associated with the design of user interfaces.

An example of a heuristic that evaluators would identify is visibility of system status where the user is informed as to what the system is doing e.g. loading screen. The evaluator would look for areas that have and are missing this heuristic and then rate them on severity to the overall operation of the system.

Cognitive walkthrough was proposed by Polsen and evaluates how well a design supports a user completing a task. It is performed by experts who walk through the design and identify problems using psychological principles. It considers what impact the design will have on users, what cognitive process are required and what learning problems may arise. An example of a cognitive walkthrough would be giving a user a set of tasks to carry out e.g., navigate through a website. The evaluator will the examine the usability based on these tasks. Normally the evaluator will evaluate if Will the user try and achieve the right outcome, will the user notice that the correct action is available to them, will the user associate the correct action with the outcome they expect to achieve, and if the correct action is performed; will the user see that progress is being made towards their intended outcome.

**C**

Motivation – motivation is the most important factor to consider in my opinion as without motivation the user will not achieve the task

Learning capabilities – learning capabilities is an important factor as for a system to be usable it must be easily learned, or the user will lose interest.

Memory – memory is an important factor as for a system to be usable the user must be able to remember how to perform a task or they will not use the system.

Powers of perception – this is also an important factor as if the user does not understand what is necessary to perform the task, they will not be able to complete it.

Attention span – attention span is also an important factor for a usable system as if the task is too long the user will lose concentration and give up on the task.

Cultural background- this factor is also important as for the system to be usable it must be targeted at multiple cultural backgrounds e.g. adding the option to change language etc.

**D**

The overall goals of evaluation in HCI is to access the functionality of a system and the effect of the interface on the user so that problems can be identified and resolved.