Health Informatics An Interprofessional Approach 2nd edition Nelson

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MULTIPLE CHOICE

1. What is the primary difference between an open and closed system?
   a. An open system has no boundary, and therefore there are no limits to the inputs and outputs between an open system and the environment.
   b. An open system has a semipermeable boundary and therefore will filter both inputs and outputs when interacting with the environment.
   c. A closed system has a semipermeable boundary and therefore will filter both inputs and outputs when interacting with the environment.
   d. A closed system does not have a boundary and therefore will not interact with the environment.

   ANS: B
   With an open system the boundary is semipermeable, thereby controlling what will be accepted as input and what will be permitted to leave the system.

   DIF: Cognitive Level: Understand REF: p. 15

2. The primary characteristics used to analyze an open system include:
   a. structure, purpose, and functions.
   b. subsystem, target system, and supersystem.
   c. boundary, attributes, and environment.
   d. hierarchical, web, and hybrid.

   ANS: A
   Using these three characteristics, one can determine why the system exists, what functions it performs to achieve its purpose, and how it is structured to achieve its purpose.

   DIF: Cognitive Level: Remember REF: p. 16

3. You have altered the menu of food items served to your patients. However, the change has greatly expanded the number of refrigerated items needed on hand. You need to buy a new refrigerator, but the electric circuit in the kitchen cannot handle the extra load and needs to be upgraded at significant expense. This set of unintended consequences down the line, produced by an initial change, is called:
   a. dynamic homeostasis.
   b. semi-planned change.
   c. negentropy.
   d. reverberation.

   ANS: D
   Change within any part of a system will be reflected across the total system through a process termed *reverberation*. Reverberation can be intended or unintended consequences of change.

   DIF: Cognitive Level: Analyze REF: p. 18

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4. The “butterfly effect” describes a situation in which a minor change in input (eg, a butterfly flapping its wings in one part of the world) can have a major effect on output (eg, a windstorm developing in another part of the world). This aspect of chaotic systems illustrates their property of:
   a. the reiterative feedback loop.
   b. linearity.
   c. preordained periodic behavior.
   d. the fractionation of outputs.

   ANS: A
   Chaotic systems are dynamic systems with reiterative feedback loops. A minor change in input can create a major change in output. This is often described as the butterfly effect. A butterfly’s flapping wings in California can over time become a hurricane in New York.

   DIF: Cognitive Level: Analyze REF: p. 18

5. Which statement describes the measurement of information as defined by the Shannon and Weaver model?
   a. The amount of information is measured by the amount of data in the message.
   b. The amount of information is measured by the number of meanings that can be assigned to a message.
   c. The amount of information is measured by the extent the message decreases entropy.
   d. The amount of information is measured by the number of characters used to create the message.

   ANS: C
   By decreasing entropy one decreases uncertainty. Shannon, a telephone engineer, sought to overcome the technical problems of moving information across communication channels by determining how to minimize entropy.

   DIF: Cognitive Level: Remember REF: p. 21 | p. 22

6. On its own, the number 190 is an example of:
   a. data.
   b. information.
   c. knowledge.
   d. wisdom.

   ANS: A
   The number 190 could refer to anything such as a person’s weight, blood glucose level, or systolic blood pressure reading and therefore has no meaning by itself.

   DIF: Cognitive Level: Apply REF: p. 22

7. Knowing when and how to use knowledge is referred to as:
   a. procedural knowledge.
   b. cognitive knowledge.
   c. decision support system.
   d. wisdom.

   ANS: D

Wisdom is defined as the appropriate use of knowledge in managing or solving human problems. It is knowing when and how to use knowledge in managing patient need(s) or problem(s).

DIF: Cognitive Level: Remember REF: p. 23

8. Which are the three general types of learned behaviors?
   a. Input, throughput, and output
   b. Adult learning theories, constructionist theories, and learning styles
   c. Cognitive, affective, and psychomotor
   d. Short, intermediate, and long-term memory

   ANS: C
   Learning is defined as an increase in knowledge, a change in attitude or values, or the development of new skills. Learned behaviors can be cognitive (intellectual skills), affective (values and attitudes), or psychomotor (the integration of cognitive and motor skills).

   DIF: Cognitive Level: Apply REF: p. 27

9. Which group will test out new technology but are not usually seen as leaders within an organization?
   a. Innovators
   b. Early adopters
   c. Early majority
   d. Late majority

   ANS: A
   Innovators will test out a new technology; however, they are too far ahead of the social group to be seen as leaders by other members of the social system. Early adopters are seen as much more discreet in their selection of new technology and are therefore better at selling a new technology to a group of potential users.

   DIF: Cognitive Level: Understand REF: p. 30

MULTIPLE RESPONSE

1. The Staggers and Nelson systems life cycle (SLC) is a guide for informatics projects. Its phases include: (*Select all that apply.*)
   a. implementation.
   b. planning.
   c. evaluation.
   d. security.
   e. diagnosis.

   ANS: A, B, C
   The seven phases of the Staggers and Nelson SLC are analyze; plan; develop or purchase; test; implement or go-live; maintain and evolve; and evaluate.

   DIF: Cognitive Level: Remember REF: p. 32 | p. 33