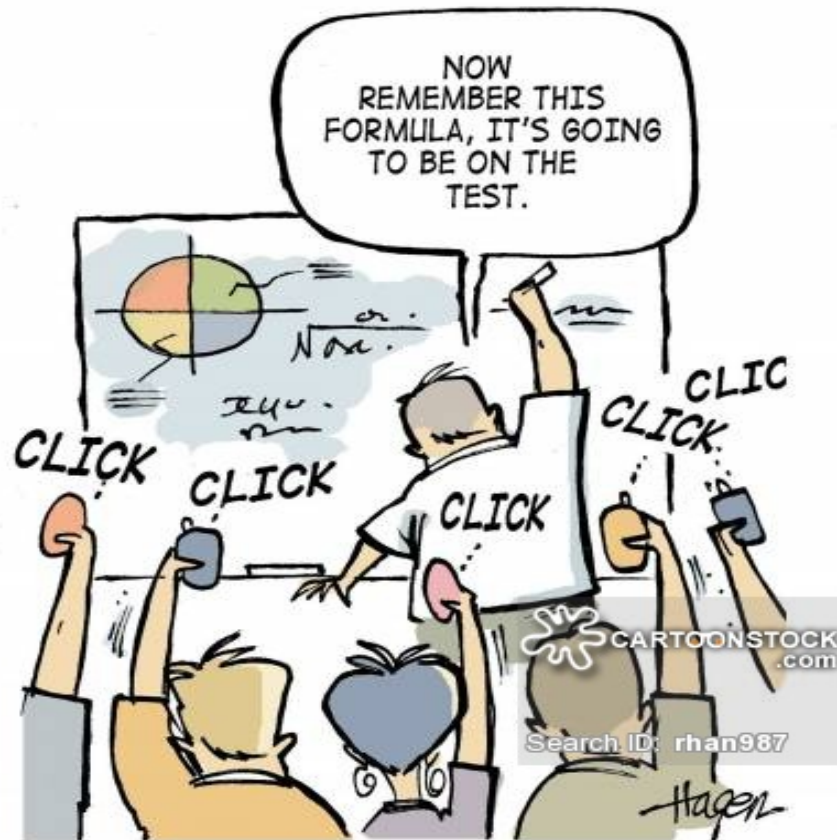


APIC-NC AND SPICE EDUCATION AND RESEARCH CBIC REVIEW

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PERSPECTIVE

- ▶ Eleven (11 of 150) 8% on education and research.



“Learning is a way to transform knowledge insights and skills into behavior. The learning environment in healthcare settings is unique because of the diversity of the healthcare personnel.”

APIC Text of Infection Control and Epidemiology 3rd Edition

EDUCATION KEY CONCEPTS

- ▶ Major goal of healthcare education is to improve job skills and competency
- ▶ Response to emerging issues
- ▶ Retention increases with immediate application
- ▶ Tied to administrative and financial goals
- ▶ Needs assessment
- ▶ Well defined plan
- ▶ Linked to organizational mission

EDUCATION TOPICS

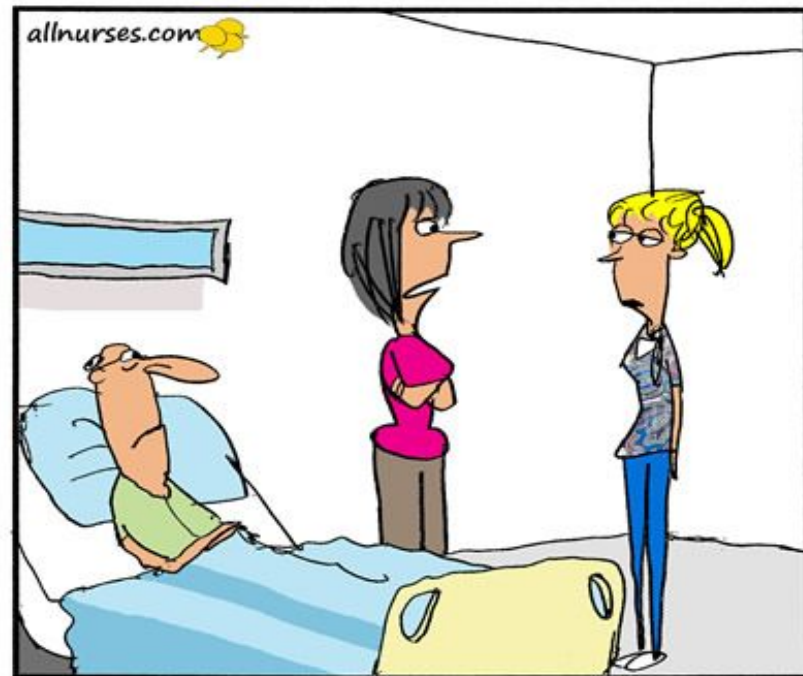
1. Assess needs, develop goals and measurable objectives for preparing educational offerings
2. Prepare, present, or coordinate educational content that is appropriate for the audience
3. Provide immediate feedback, education, and/or training when lapses in practice are observed
4. Evaluate the effectiveness of education and learner outcomes (e.g., observation of practice, process measures)

EDUCATION TOPICS

5. Facilitate effective education of patients, families, and others regarding prevention and control measures

6. Implement strategies that engage the patient, family, and others in activities aimed at preventing infection.

About a Nurse



“I’m a close relative, and I did some research on the Internet about his condition, so I feel I’m more qualified to take care of him than some nurse.”

LEARNING PROCESS

What is learning?

- ▶ Process of transforming new knowledge, skills, and values into behavior
- ▶ Generally active process directed toward goals
- ▶ Usually involves conflict and resistance to giving up comfortable ways of doing things
- ▶ Decision to change is necessary before learning can occur.

LEARNING THEORIES

- ▶ Psychoanalytic school-control urges (Freud)
- ▶ Behavioral school-reward (Pavlov, Skinner)
- ▶ Humanistic School-holistic approach. Capable of growth and self-direction
- ▶ Constructivism – how learners think (mind mapping)
- ▶ Andragogy vs. pedagogy-adult/child (Knowles)

ADULT LEARNERS MOTIVATIONAL NEEDS

What motivates adult learning needs?

- ▶ Response to current situations
- ▶ Problem centered (prefer practical to academic)
- ▶ Motivated by job needs (new skills or desire for promotion or increased salary)

ROADBLOCKS TO LEARNING

- ▶ Does not always predict improved behavior
- ▶ Become rapidly bored
- ▶ Afraid of embarrassment
- ▶ Fear of failure

RETENTION OF INFORMATION

▶ Reading	10%
▶ Listening	20%
▶ Seeing	30%
▶ Listening + observing	
+ discussing	70%
▶ Listening + observing	
+ discussing + performing	90%

LEARNING DOMAINS

- Cognitive learning (Recall, intellectual, application)
- Affective learning (New ideas, feelings, desire to learn)
- Psychomotor learning (Learning new skills or new way of acting or doing)

COGNITIVE LEARNING

- ▶ Definition: Recall or recognition of knowledge involving the acquisition of new insights, new ways of thinking, problem-solving, and the development of intellectual abilities.
- ▶ Examples:
 1. *Recognize* the protective attire to be worn in caring for a patient on Contact Precautions.
 2. *Evaluate* IPC policies specific to traffic control in the operating suite.

AFFECTIVE LEARNING

▶ Definition: Learning new attitudes, values, beliefs, and way of being.

▶ Examples:

1. Creating an environment which facilitates the learning experience and development of positive attitudes. Try to achieve a comfort level that reduces inhibition, promotes communication and creativity of thought.

PSYCHOMOTOR LEARNING

- ▶ Definition: Learning new skills or new ways of acting or doing.
- ▶ Example: Demonstrating the appropriate techniques used to suction a tracheostomy.

EDUCATIONAL PLAN

- ▶ Determine needs assessment
 - ▶ Healthcare workers
 - ▶ Institution
 - ▶ Community
- ▶ In accordance with accrediting and regulatory groups

EDUCATIONAL PLAN

- ▶ Goals:
 - ▶ overall purpose
 - ▶ defined in time/resources
- ▶ Objectives
- ▶ Methods

DEFINE GOALS

- ▶ Goals: Broad statements of general purpose intended to address educational needs.
- ▶ Characteristics of goals
 - Communicate the intent of curriculum.
 - Provide a direction for planning.
 - Define expectations clearly to people involved.
 - Use a realistic approach in terms of time and money.

EDUCATIONAL PLAN

- ▶ Basic rules for writing objectives:
 - ▶ Must be specific
 - ▶ Must be measurable
 - ▶ Must be achievable
 - ▶ Must be relevant to the material presented
 - ▶ Must have a specific outcome

DEFINE INSTRUCTIONAL OBJECTIVE

- ▶ Instructional Objective: Describes the educator's intent of what specific actions the learner will perform.

Major components of an instructional objective describes:

- ▶ Performance - behavior the learner will do
- ▶ Conditions – conditions under which performance occurs.
- ▶ Criterion – level at which the learner must perform

(Speed to perform, accuracy or no of errors, quality of acceptable deviation)

PRINCIPLES OF OBJECTIVE WRITING

- ▶ Principles of instructional objective writing:
 1. Describe learner behavior rather than teacher behaviors.
 2. Use action verbs to signify what learner must do.
“To list,” “to identify,” “to solve,” as opposed to
“to know,” “to understand” to wide an interpretation.
 3. Select action verbs that reflect domain of learning
“evaluate,” “assess,” “identify”

LEARNING OBJECTIVES

NEEDS:

Knowledge

Attitudes

Skills

DOMAINS:

Cognitive-think

Affective-feel

Psychomotor- do

OBJECTIVES

Define

Express

Demonstrate

PEER TO PEER MENTORING PROGRAM

- ▶ CDC HH Guideline describes the importance of role models.
- ▶ Research suggests that HH compliance is influenced significantly by behavior of other HCP.
- ▶ IPs should emphasize the importance of role modeling to set high standards and improve safety.
- Improves infection prevention competency.

QUALITY IMPROVEMENT MEASURES

- ▶ QI is systematic and continuous actions that leads to measurable improvement in outcomes.
- ▶ Data collection is cornerstone of QI, evaluate change and success of processes or systems.
- ▶ Analysis of program evaluation scores before the next presentation.

HYBRID EDUCATIONAL PROGRAM MODEL

- ▶ “Hybrid” or “blended” learning is a formal education course.
- ▶ Some traditional face-to-face or classroom methods are replaced by online learning activities.
- ▶ Example: attendance at a live event with assigned follow-up activities.

JUST-IN-TIME TEACHING

- ▶ JiTT uses feedback between classroom activities and work students do at home to prepare classroom.
- ▶ Goals to increase learning during classroom time, evaluate and fine tune learner needs, and motivate to modify and add to it and apply new knowledge.
- ▶ Example of when to use: Staff who repeatedly have problems applying HAI definitions.

LECTURE FORMAT

- ▶ Lectures convey critical information, teach new knowledge and skills, promote reflection, and stimulate further work and learning.

The best time to use a lecture for education is:

- ▶ Presentation of data, and there is no collaboration or training required.
- ▶ Example: Reviewing accreditation survey results of IP Program with managers.

DIDACTICS

- ▶ A theory of teaching and learning by lecture.
- ▶ Sometimes used to refer to lectures that are overburdened with instructional or factual material.
- ▶ Example: Classroom portion of training or educational program.

PROFESSIONAL IP COMPETENCY

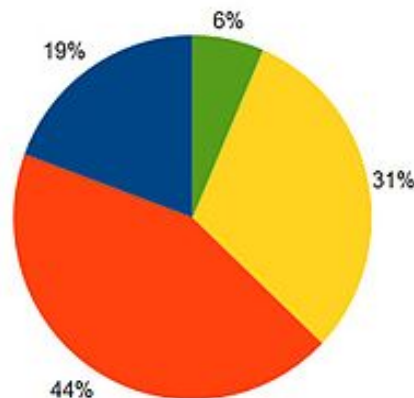
Components of professional competency?

- ▶ Knowledge and skills
- ▶ Communication and values
- ▶ Reasoning and teamwork

PIE CHART

When and why to use a pie chart?

- ▶ Circular chart to display the mean score for each group.
- ▶ Best suited for visually and rapidly comparing one group to another.
- ▶ Example: Summarize the results of educational program provided to five different groups.



BEHAVIORISM

- ▶ Approach to psychology, that combines elements of philosophy, methodology, and theory.
- ▶ Focuses on one particular view of learning: a change in external behavior a large amount of repetition of desired actions, the rewards of good habits, and the discouragement of bad habits.
- ▶ To sustain behavior post initial training focus on repetition and reinforcement

BEHAVIOR CHANGE

Best way to assess behavioral change after house wide HH education session is by:

- ▶ Observing the behavior!
- ▶ Example: By sending a trained anonymous observer to units to assess HCP and monitor compliance.

ENABLING FACTORS

Enabling factors that allows the change process:

- ▶ Do they have necessary skills, capability, and necessary resources?
- ▶ Managed by training and coaching for skill development or by helping obtain access to needed resources.
- ▶ Examples: Is HH sanitizer or PPE readily accessible?

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"I use so much alcohol-based hand sanitizer, my hands had to join a 12-step program!"

REGULATORY EDUCATIONAL REQUIREMENTS

Training required by U.S. regulatory agency.

- ▶ OSHA Bloodborne Pathogens Final Rule
- ▶ Requires annual training and recordkeeping
- ▶ Preventing employee exposure to bloodborne pathogens

DIVERSITY

HCP education and training is unique and complex because of a diversity of personnel. Successful strategies includes considering all of the following:

- ▶ Age, cultural background, ethnicity, educational level, and learning styles.
- ▶ Literacy, cultural diversity, cross training and technological advances
- ▶ Knowing learning theories and educational needs of learner population, the institution, and community

CLASSROOM MANAGEMENT

Classroom management techniques refers to:

- ▶ Skills and methods that teachers use to keep students orderly and organized to maximize behaviors that facilitate or enhance learning.
- ▶ Early establishment of rules, standards, and expectations can minimize disruptions.
- ▶ First remaining calm and assessing best way to intervene for persistent disruptions and unruly behavior.

HAWTHORNE EFFECT

Hawthorne effect refers to:

- ▶ Phenomenon whereby HCP improve or modify an aspect of behavior or skill in response to a change in their environment.
- ▶ May yield a temporary and artificial high result.
- ▶ Example: Worker aware they are being observed or monitored, rather than to nature of the change itself (e.g hand hygiene).

ITEM ANALYSIS

Item analysis is:

- ▶ Process of examining student's test scores as well as the individual test questions.
- ▶ Useful for improving the quality of the test.
- ▶ Valuable for increasing the instructor's skill in test construction and identifying areas that need improvement or greater emphasis.

IPCP COMPONENTS

- ▶ **HCP IPC education must be included in all of the following Infection Prevention Control Program (IPCP) components:**
- ▶ Facility infection prevention risk assessment
- ▶ Facility infection prevention program plan
- ▶ Annual facility budget and allocation of resources

EDUCATIONAL RESOURCES

What are the most rigorous and reliable resources of clinical evidence to base educational programs?

- ▶ Standards issued by national or international authoritative sources.

Lesser but not the best resources include:

- ▶ Best-practice guidelines from professional organizations
- ▶ Consensus statements published by leading SMEs
- ▶ Literature review of publications during the past 5 years.

EDUCATION SUMMARY

- ▶ 1. Basic goal of HC education and training is to improve job skills and competence.
- ▶ 2. HC is rapidly changing and complex training must address literacy, diversity, cultural competency, cross-training, and technological advances.
- ▶ 3. Must include learning theories and educational needs of learner pop, institution and community.

EDUCATION QUESTION 1

Adult learners are often motivated to learn by:

- ▶ 1) The need for new skills
- ▶ 2) Professional standard mandates
- ▶ 3) Desire for promotion and increased salary
- ▶ 4) Changing cultural expectations

EDUCATION QUESTION 2

The healthcare facility has established a goal of improving infection prevention competency with hand hygiene among all staff. Which of the following education and training approaches should the IP recommend as a priority?

- a. Analysis of human factors that may present unrecognized obstacles for compliance
- b. Attending local/state health department educational programs on hand hygiene.
- c. Implementation of a mentoring program based on peer-to-peer instruction and coaching.
- d. Intensified disciplinary actions for employees who do not follow hand hygiene procedures.

EDUCATION QUESTION 3

Which of the following should be used as a quality improvement measure for infection prevention education programs?

- a. The frequency of classes offered through the year
- b. The average number of attendees per class offered
- c. Summary of pre/post test scores for each class
- d. Analysis of program evaluation scores for all classes

EDUCATION QUESTION 4

The IP is asked to provide content for a hybrid education program. This model is most based on:

- a. Attendance at a live event with assigned online follow-up activities.
- b. Combination on online and independent for a specific topic.
- c. Independent study with concurrent mentoring from a local expert
- d. Self-assessment of learning needs that is used to develop an instructional plan.

EDUCATION QUESTION 5

- ▶ Which of the following situations would be best for the IP to apply just-in-time learning principles?
 - a. During a 30 minute orientation session for new employees
 - b. With staff who repeatedly have problems applying infection definition
 - c. In a medical staff meeting where surveillance priorities are being discussed
 - d. For nurse managers evaluating monthly infection trend reports

EDUCATION QUESTION 6

A form of interactive training is often preferred among adult learners. However, in some situations a lecture may represent the best approach. In which of the following situations should the IP consider a lecture?

- a. When reviewing accreditation survey results for the infection prevention program with managers
- b. When addressing inaccurate data entry of reportable infections by a health data analyst
- c. After observing unsafe disposal of contaminated syringes in the ER
- d. When discovering employees with influenza-like symptoms providing patient care.

EDUCATION QUESTION 7

The director has requested that the IP summarize the results of an education program to five different groups within the institution. The director specifically requests that the method used not only indicate the overall mean score for all who participated. The best data display technique to summarize these would be:

- a. A line list
- b. A pie chart
- c. A bar chart
- d. A spreadsheet

EDUCATION QUESTION 8

Many infection prevention programs address behavioral change. To achieve sustainable success following initial training, the IP must focus on which aspect of behavior?

- a. Avoidance of behavior change
- b. Repetition and reinforcement
- c. Need for approval and recognition
- d. Critical thinking and judgement

RESEARCH

RESEARCH TOPICS

Research

- ▶ Conduct a literature review
- ▶ Critically appraise the literature
- ▶ Facilitate incorporation of applicable research findings into practice

ABSTRACT COMPONENTS

The abstract in a research study must include:

- ▶ The intent or objective of the study
- ▶ Brief summary and it's methods
- ▶ Main findings and conclusions

METHODS

All of the following are features of a well-written research methods section:

- ▶ Detailed description of how the study was conducted,
- ▶ Information on participants/subjects,
- ▶ Information on materials/apparatus/measures,
- ▶ Description of the procedure

INTERNAL VALIDITY

Internal validity refers to:

- ▶ How well an experiment is done, especially whether it avoids systematic errors.
- ▶ High degree demonstrates strong evidence for causality
- ▶ In the methods section, describes what procedures were followed to minimize threats, the results section reports relevant data, and the discussion section assesses the influence of bias.

NULL HYPOTHESIS

- ▶ Hypothesis that there is no statistical significance between the two variables or two populations, any observed difference being due to sampling or experimental error.
- ▶ Usually the hypothesis a researcher or experimenter will try to disprove or discredit.
- ▶ The p value of (≥ 0.05) is the probability of obtaining the observed sample results (or a more extreme result) when the null hypothesis is actually true.

THE ALTERNATIVE HYPOTHESIS

- ▶ An alternative hypothesis is one that states there is a statistically significant relationship between two variables.
- ▶ If the p value is within the significant level (≤ 0.05), it suggests that the observed data is inconsistent with the assumption the null hypothesis is true,
- ▶ so the null hypothesis must be rejected and the alternative hypothesis accepted as true.

DESCRIPTIVE STATISTICS

- ▶ Describing the population under study.
- ▶ What it does – Organize, analyze, and presents data in a meaningful way
- ▶ Form of results – Charts, graphs, and tables
- ▶ Usage – To describe a situation
- ▶ Function – Explains the data, which is already known, to summarize sample

INFERENCEAL STATISTICS

- ▶ Allows making predictions (inferences) from sample of population.
- ▶ What it does – Compares, test and predicts data
- ▶ Form of report – Probability
- ▶ Usage – To explain the chances of occurrence of an event

MULTIVARIATE STATISTICS

- ▶ Observation and analysis of more than one statistical outcome variable at a time.
- ▶ Example : Multiple regression or Analysis of Variance (ANOVA)
- ▶ Required when there are 4 or more dependent variables to be examined against an independent or variables

META-ANALYSIS

Meta-analysis is:

- ▶ A statistical method that combines the results of independent studies.
- ▶ Statistically combining the results of a large number similar studies
- ▶ A precise estimate of treatment effect, giving weight to the size of the different studies included.

SUMMARY OF RESEARCH

- ▶ 1. Critical evaluation of published research is necessary to assess usefulness and validity of research findings.
- ▶ 2. Incorporating evidence-based research findings into practice serves to improve safety, quality care, and outcomes of individuals, providers and organizations.

RESEARCH QUESTION 1

An assessment of internal validity and the influence of bias can be found in which section of a research study?

- ▶ a. Introduction
- ▶ b. Results
- ▶ c. Discussion
- ▶ d. Methods

RESEARCH QUESTION 2

All of the following are features of well-written research methods sections except:

- a. Time period of the study
- b. Clear criteria for defining cases and controls
- c. Questions the research will answer
- d. Methods of quality assurance

RESEARCH QUESTION 3

The IP is reviewing a research study to assess the association between needless connectors (NC) change frequency and CLABSI rate. In a multivariate analysis, the CLABSI rate was significantly higher ($p=0.001$) among patients that had NC changed every 24 hours compared to patients changed at 96 hours. The IP knows that value this p value indicates more evidence in support of which of the following?

- a. The alternative hypothesis
- b. The quality of the analysis
- c. The null hypothesis
- d. The statistical hypothesis

RESEARCH QUESTION 4

Which of the following refers to the statistical technique that combines the results of a large number of studies?

- a. Linear regression analysis
- b. Inferential statistics
- c. Meta-analysis
- d. Axiomatic approach

RESOURCES

1. Grota P, ed. APIC TEXT of Infection Control and Epidemiology, 4th edition. Washington, DC: APIC, 2014. Also online at [Http://text.apic.org](http://text.apic.org)

Notable Chapters

- ▶ 3 Education and Training
- ▶ 5 Infection Prevention and Behavioral Interventions
- ▶ 19 Qualitative Research Methods
- ▶ 20 Research Study Design



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**“I spent 2 years in nursing school. There was
3 months of anatomy, 3 months of clinical
and 18 months learning how to
wash our hands properly.”**