Boston Children's Hospital
Fall Education Retreat

# DEVELOPING EFFECTIVE CURRICULA: A SIX-STEP APPROACH AND THE IMPORTANCE OF NEEDS ASSESSMENT

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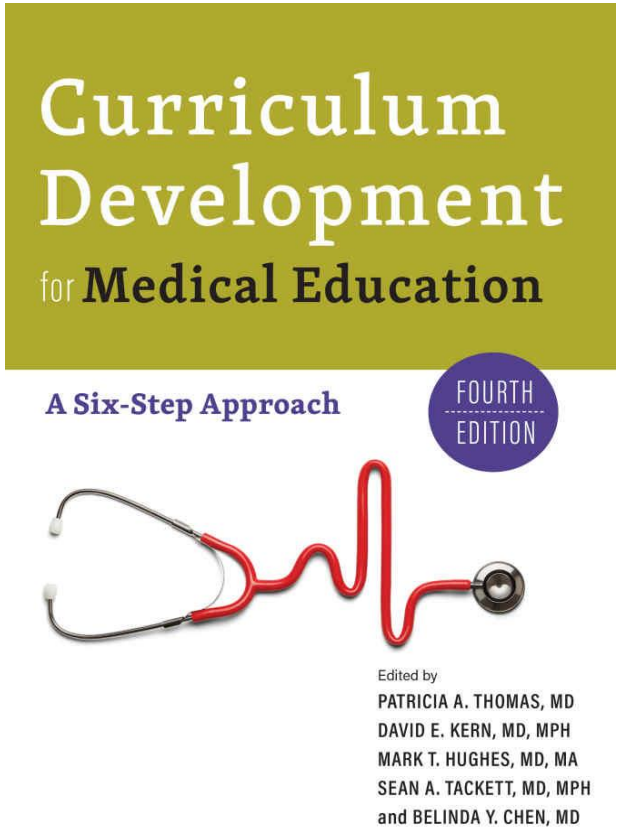



# Disclosures

Dr. Kern is an editor and author for the book:

- Thomas PA, Kern DE, Hughes MT, Tackett, S, and Chen BY. *Curriculum Development for Medical Education: A Six-Step Approach*, 4th ed. Baltimore (MD): Johns Hopkins University Press; 2022.

and receives royalties from the publisher, Johns Hopkins University Press.

# WORKSHOP OBJECTIVES

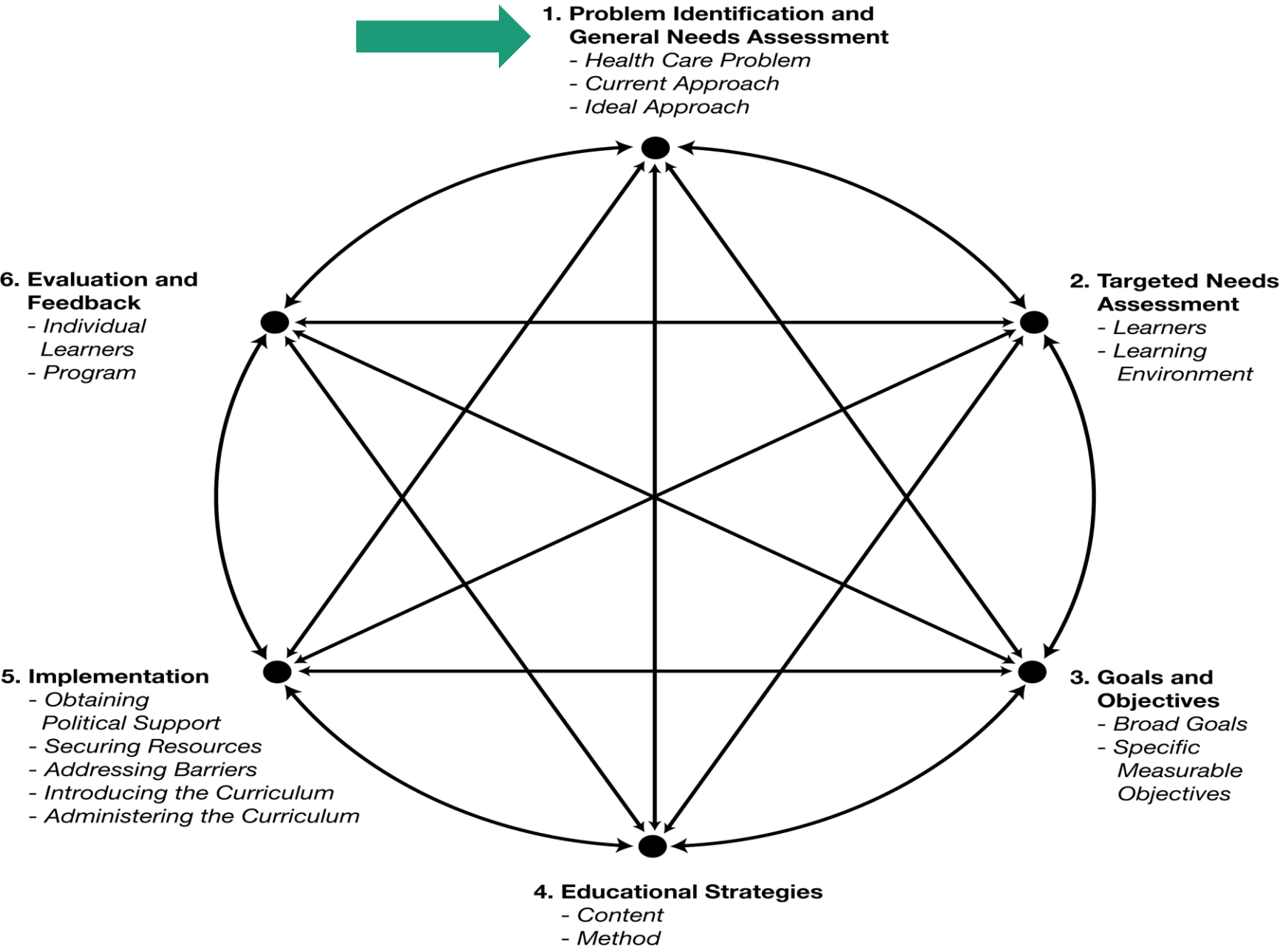
By the end of the CD workshop, participants will be able to:

- List the six steps of curriculum development
- Describe why the six-step approach is relevant for educational scholarship
- Describe the elements of Steps 1 & 2 (Problem Identification, General and Targeted Needs Assessment) and why they are fundamental to developing effective curricula
- Engage in applying Steps 1 & 2 to a curricular idea
- Identify additional resources for curriculum development

# CURRICULUM: DEFINITION

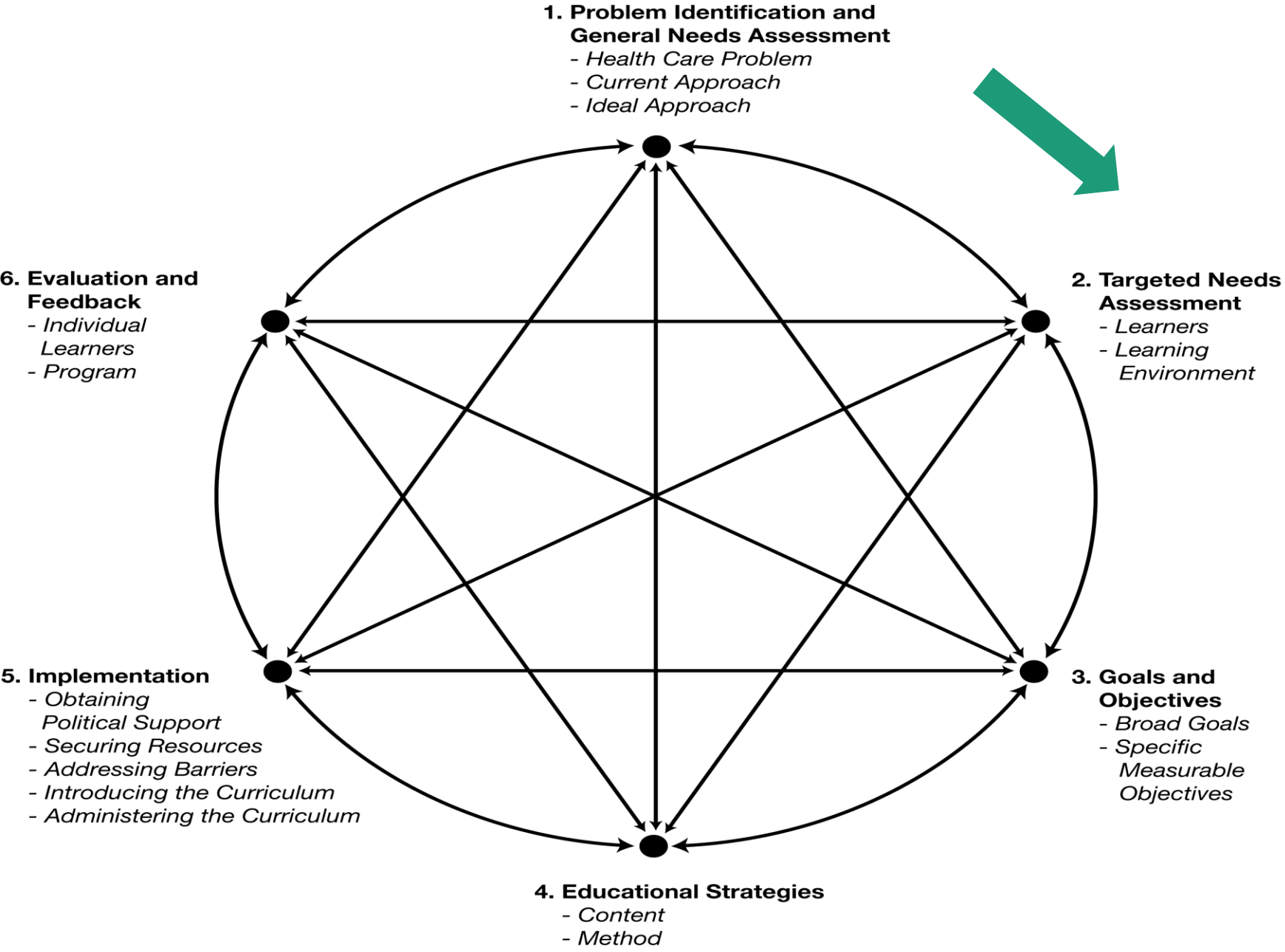
- *A planned educational experience*

# What are the Six Steps?



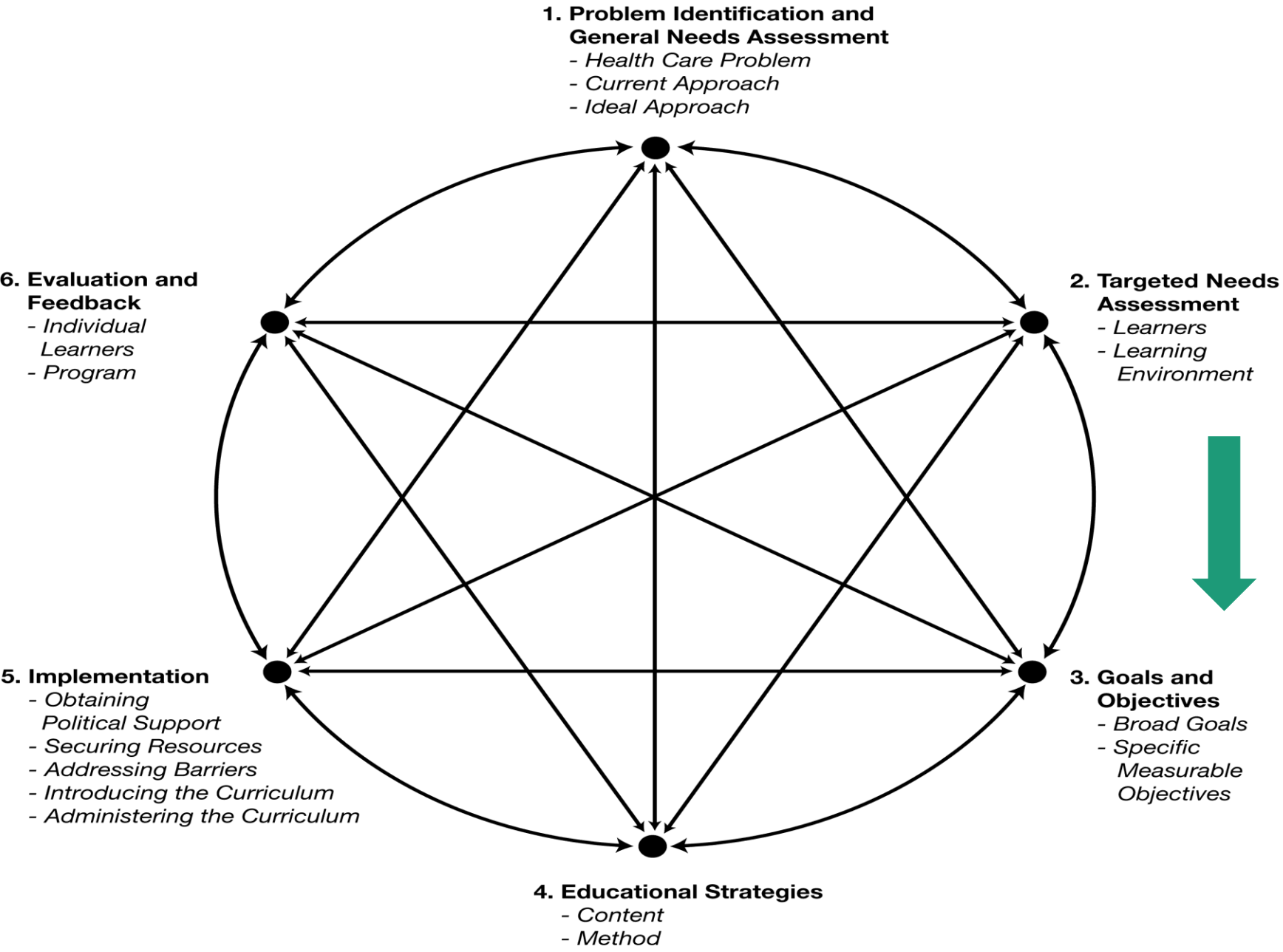

- Step 1: Problem Identification and General Needs Assessment

...building the foundation for meaningful objectives




## Step 2: Targeted Needs Assessment

*… refining the foundation*




## Step 3: Goals and Objectives

*… the reason for teaching*

# GOALS

*Goals* are broad educational objectives, the general ends toward which an effort is directed. They are usually not measurable as written.

- Example:  The purpose of the acute care curriculum is to prepare medical students to identify and initiate management for common in-hospital emergencies.

# OBJECTIVES

*Objectives* are specific & measurable.

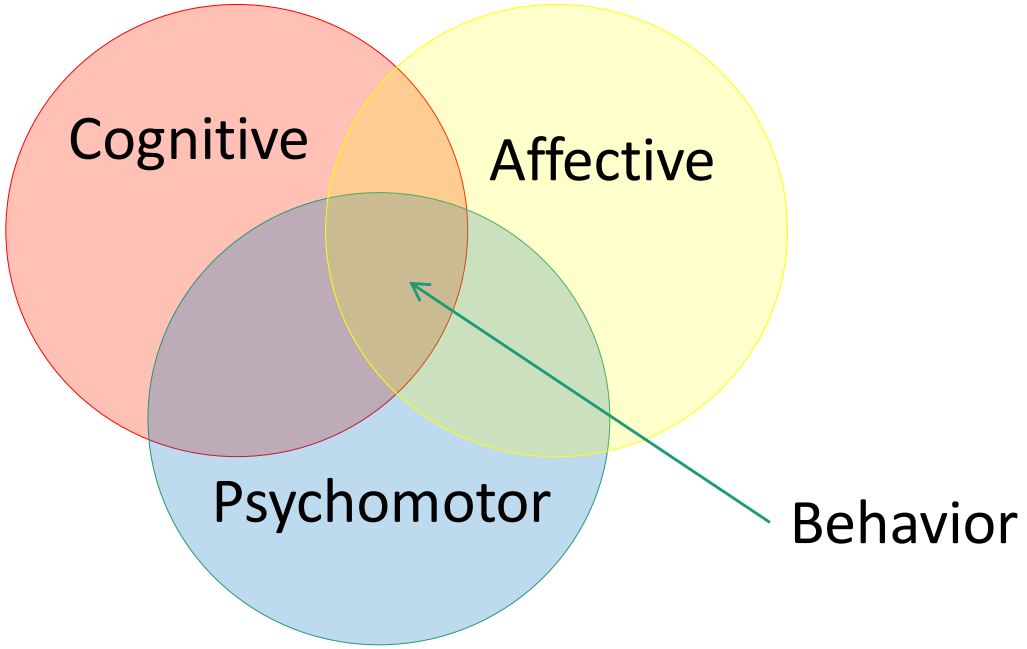
- Example: By the end of the resuscitation module, medical students will have:
  - Demonstrated an initial assessment for a patient in cardiac arrest, including prioritization of circulation over respiration and limitation of time devoted to assessment.
  - Identified the three most common shockable cardiac rhythms.
  - Demonstrated correct use of both automated and manual defibrillators, including appropriate rhythm check, delivery of shock, if indicated, and correct shock interval.

# IMPORTANCE OF OBJECTIVES

- Help prioritize
- Direct content (what)
- Identify learning methods (how)
- Enable and direct evaluation
- Permit clear communication to learners, faculty, and other stakeholders
- Required by accrediting bodies (e.g. ACGME / LCME/ CCNE)

# TYPES OF OBJECTIVES

- Learner Objectives
  - Cognitive
  - Affective
  - Psychomotor
- Program Objectives
- Process Objectives
- Patient / Healthcare Outcome Objective



# HIERARCHY OF OBJECTIVES

- Patient / healthcare outcome >
  - Behavioral / performance >
    - Skill / competence >
      - Attitudes / higher order cognitive >
        - Knowledge

Those lower in the hierarchy may be enabling for those higher.

# HOW TO WRITE OBJECTIVES

Who

Will do

How much/how well

Of what

By when

# HOW TO WRITE OBJECTIVES

- Goal: To introduce curriculum development principles to workshop participants.

Who

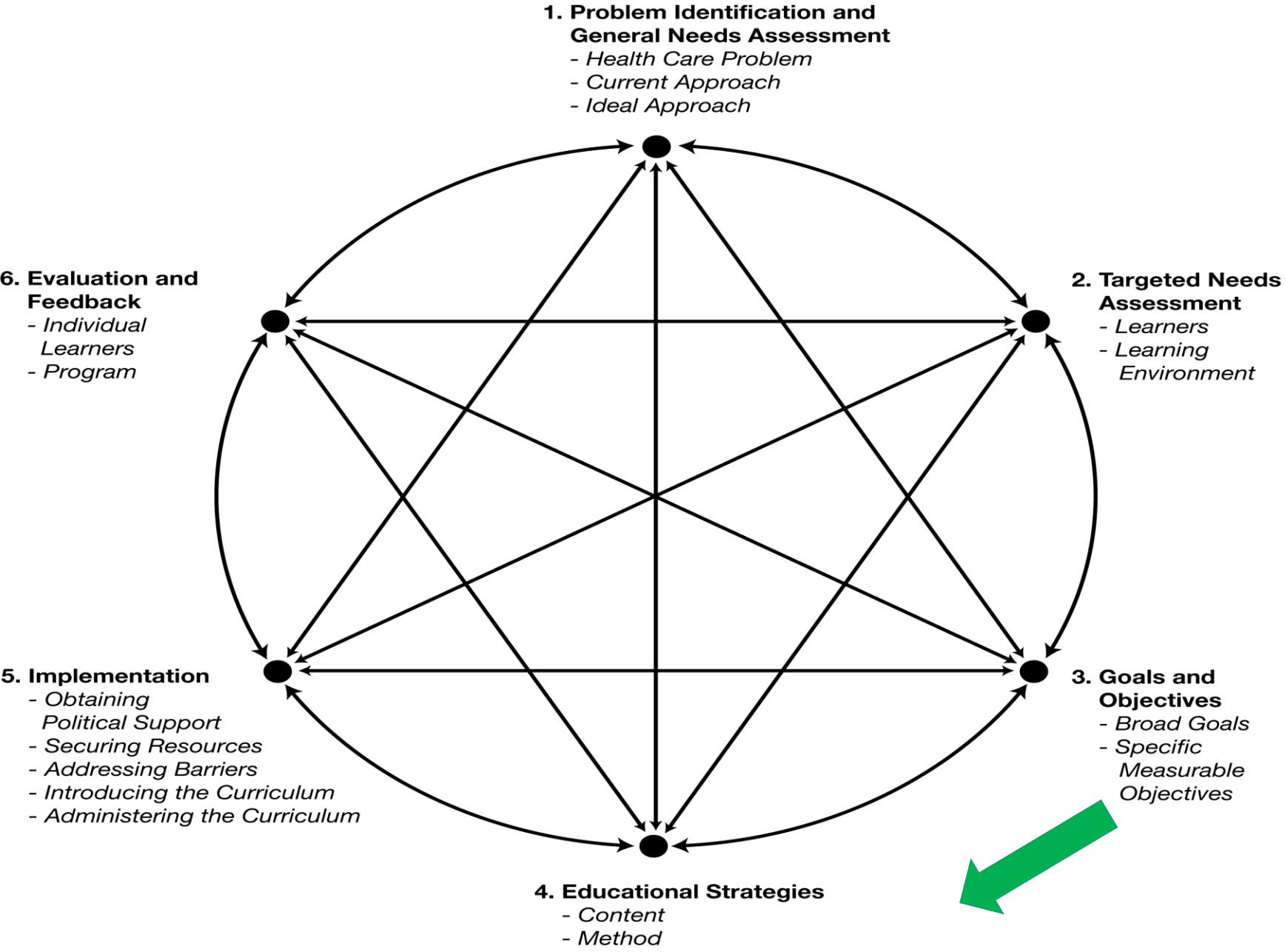
Will do

How much/how well

- Objective: **Workshop participants will be able to list correctly the six steps of curriculum development by the end of the session.**

Of what

By when




# Step 4: Educational Strategies

*… accomplishing educational objectives*

# EDUCATIONAL METHODS: GENERAL GUIDELINES

- Maintain *congruence* between objectives and methods
- Use *multiple* educational methods
- Choose educational methods that are *feasible*
- Remember that *assessment can drive learning* ("internalization of assessment criteria")

# Educational Methods:
# Simple Cognitive Objectives

- Readings / Graphics
- Lectures
- Audio-visual Materials

# Educational Methods:
# Higher-Order Cognitive Objectives

- Discussion
- Case-based learning
- Problem-based learning
- Team-based learning

# Educational Methods:
# Affective Objectives

- Exposure (readings, discussions, exposure to other's experiences/narratives, creating experiences for learner)
- Facilitation of openness, introspection & reflection
- Role Modeling
- Reflective writing

# Educational Methods: Psychomotor Skill Objectives

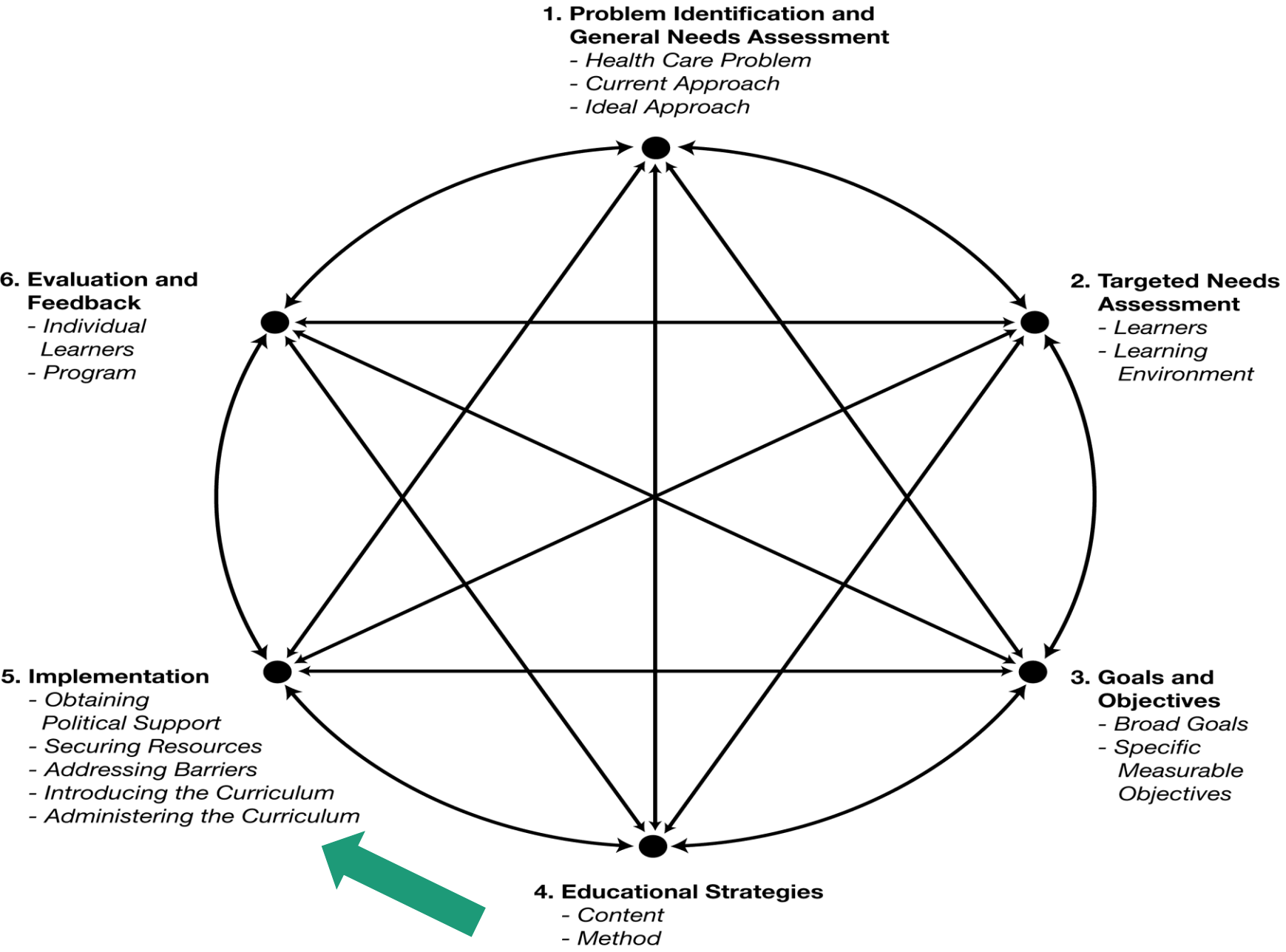
- Supervised experience
- Simulation with debrief
- Feedback on recorded performance

(Assumes adequate knowledge)

# Educational Methods:
# Behavior Objectives

- Removal of *barriers* to performance
- Provision of *resources* that facilitate performance
- Provision of *reinforcements* for performance

(Assumes adequate knowledge, attitudes & skills)




## Step 5: Implementation

*… making the curriculum a reality and converting a good plan into an accomplishment*

# STEP 5: IMPLEMENTATION

## Targeted learning environment

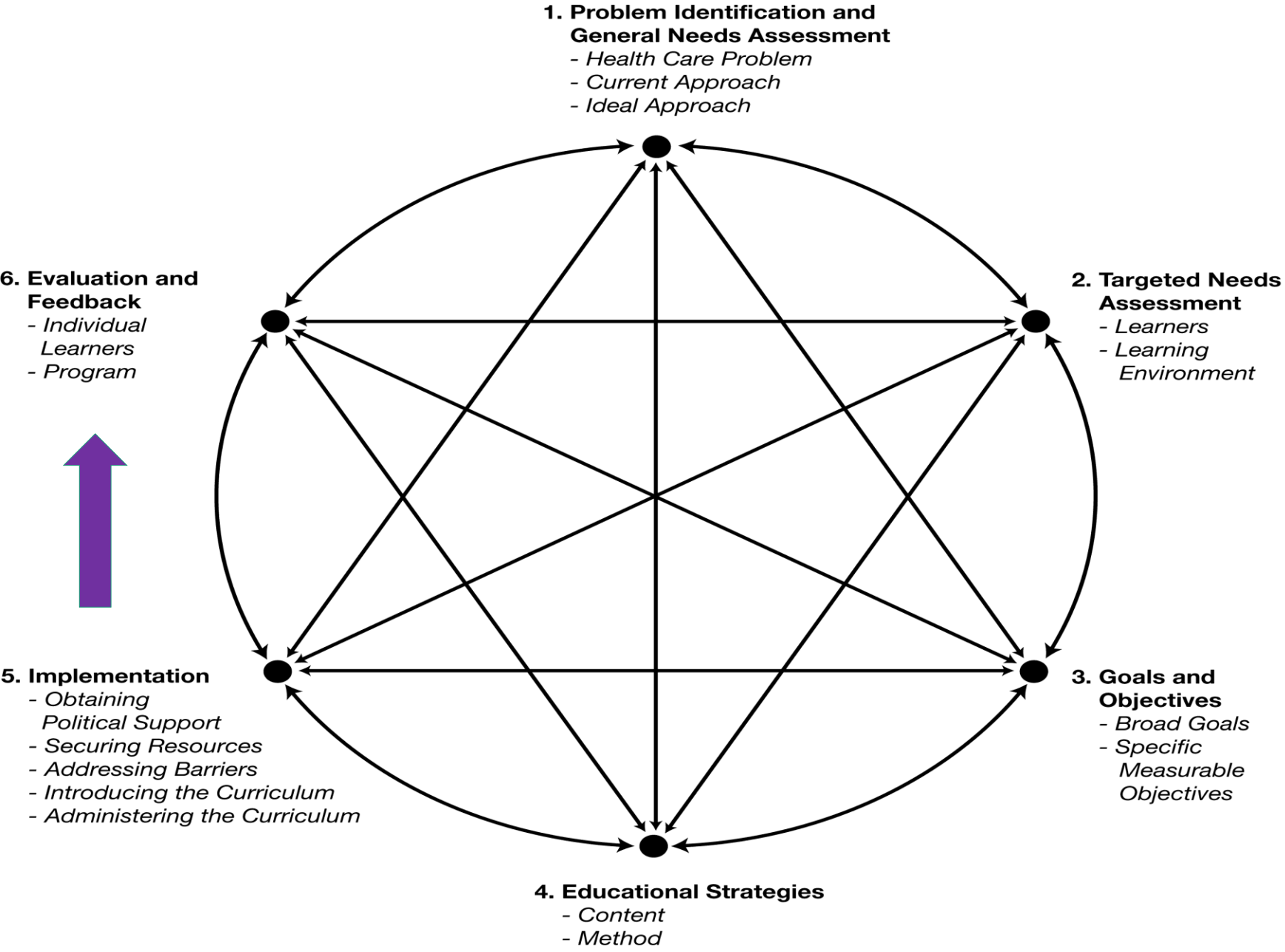
- ✓ Related existing curricula
- ✓ Hidden / informal curriculum
- ✓ Specific enabling and reinforcing factors / barriers
- ✓ Resources
- ✓ Stakeholders
- ✓ Politics / factors related to:
  - ✓ Institutional administration
  - ✓ Policy and procedure

## Step 5:

- Identify Resources: Faculty, Time, Space, Funds
- Obtain Support
- Anticipate and Address Barriers
- Plan administration
- Introduce the curriculum (pilot / phase-in / full)

## Targeted learners

- ✓ Previous training & experience
- ✓ Current performance
- ✓ Perceived learning needs
- ✓ Preferences




## Step 6: Evaluation and Feedback

*… assessing the achievement of objectives and stimulating continuous improvement*

# EVALUATION AND FEEDBACK: WHY?

- To determine if goals and objectives met
- To provide information for improvement
- To assess individual achievement
- To satisfy external requirements (e.g., ACGME, CCNE)
- To document accomplishments of curriculum developers
- To maintain and garner support
- To serve as a basis for presentations/publications

# THE 10 TASKS OF EVALUATION

I. Identify Users
II. Identify Uses
III. Identify Resources
IV. Identify Evaluation Questions
V. Choose Evaluation Designs
VI. Choose Measurement Methods
VII. Address Ethical Concerns
VIII. Collect Data
IX. Analyze Data
X. Report Results

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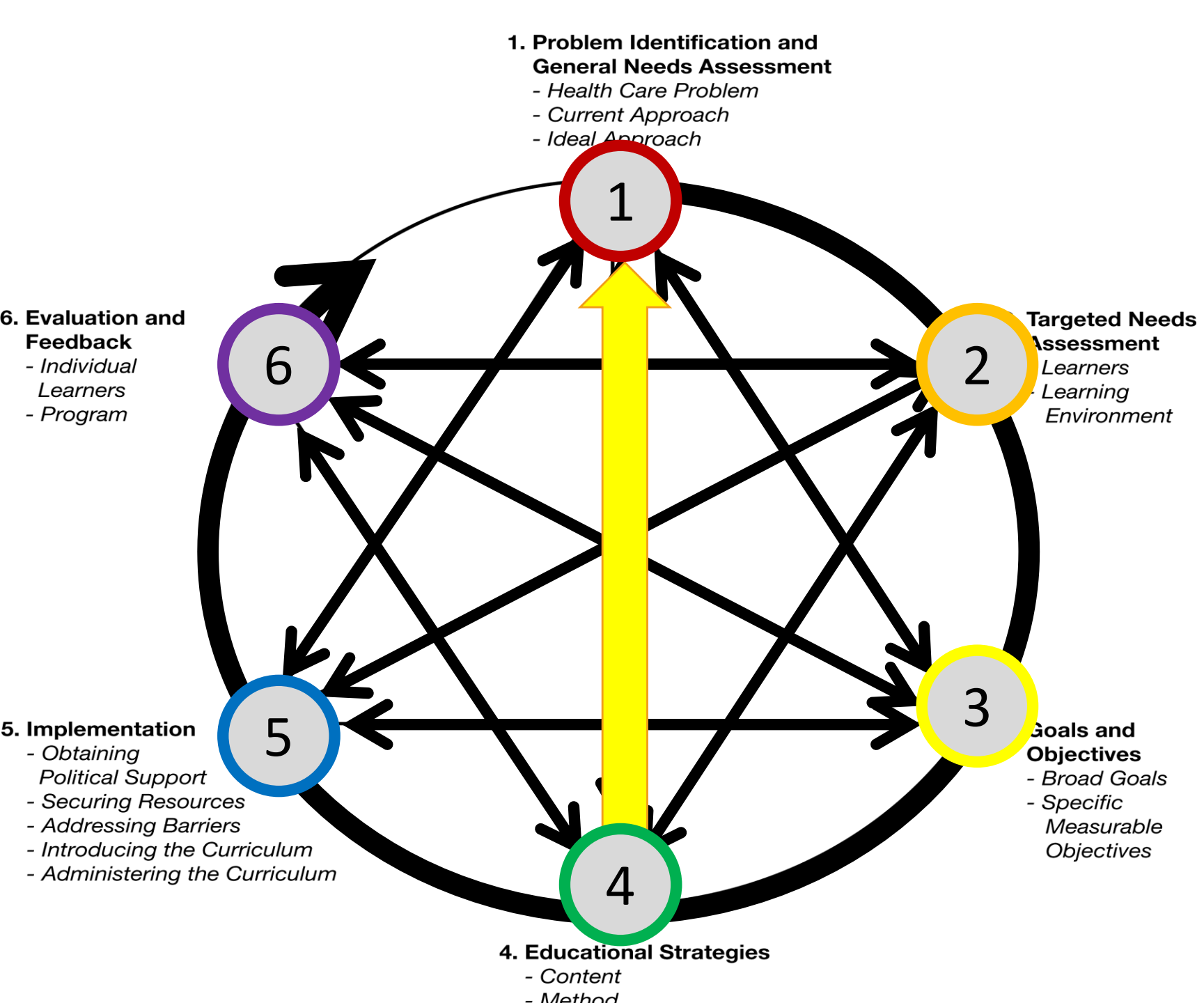
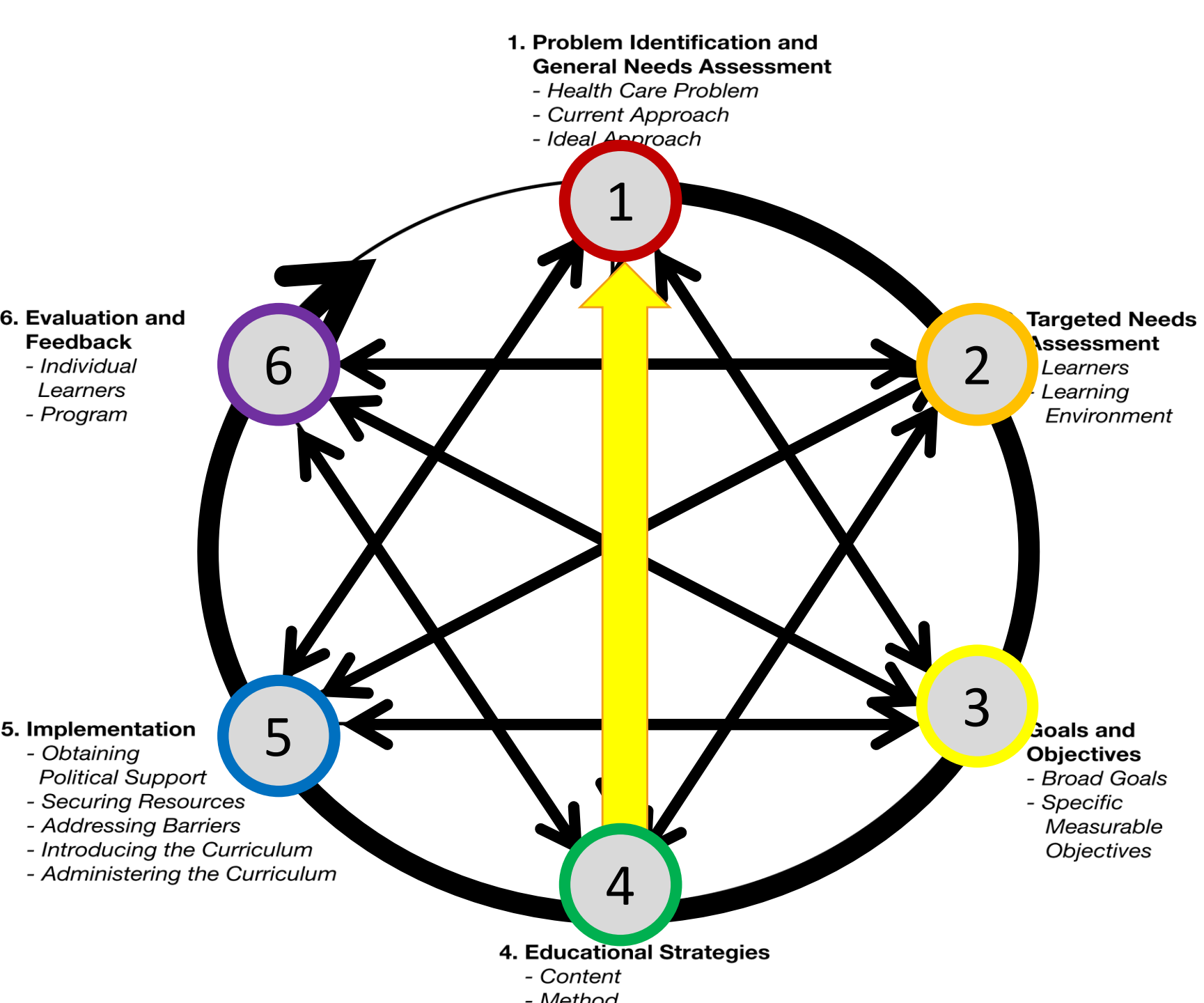
X. Report Results

# TAKE HOME MESSAGE




# The Curriculum Development Six-Step Dynamic Diagram

- Cyclical
- Interactive
- Oriented to health needs

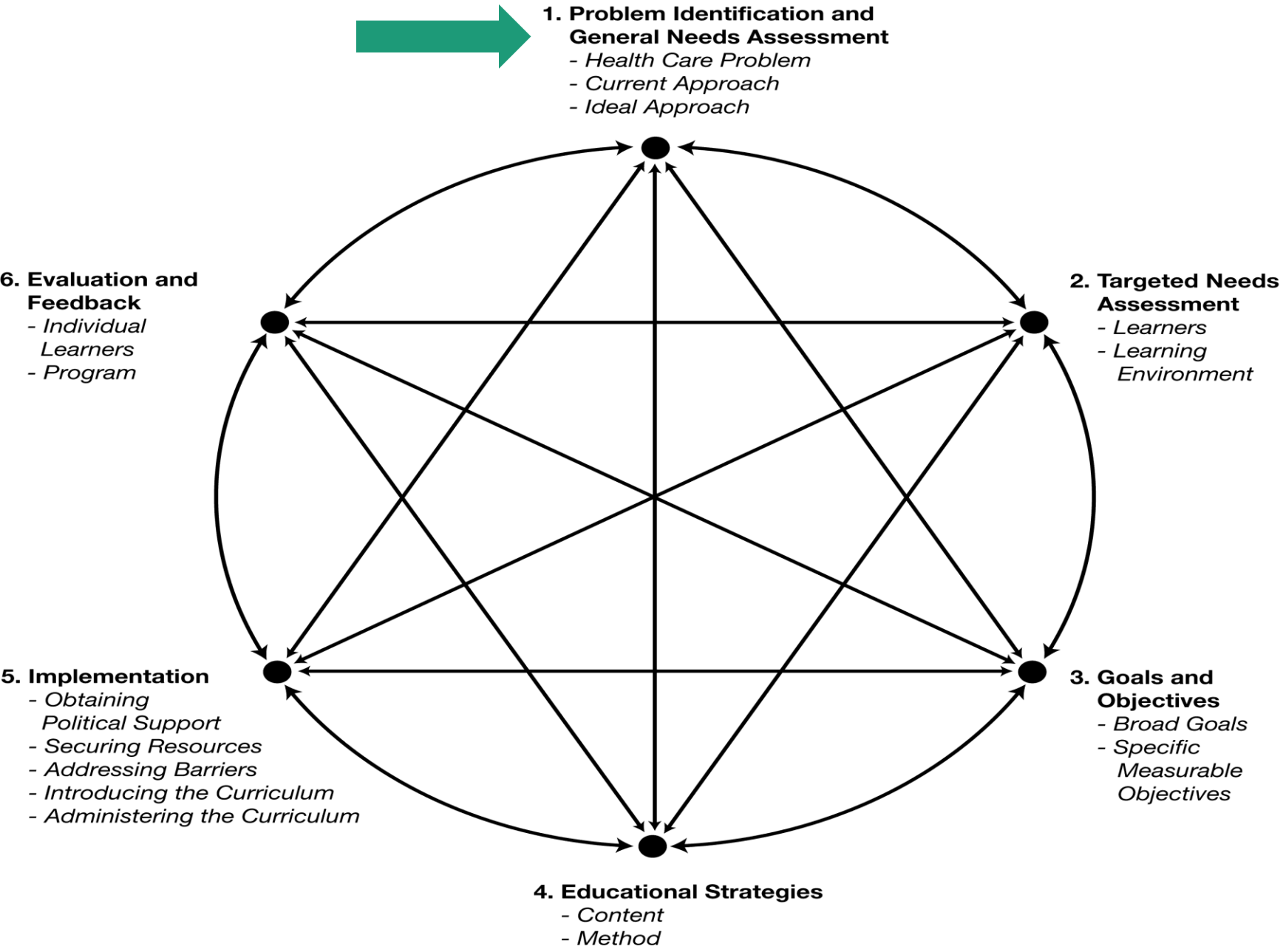



# Maintenance and Enhancement

# Is CD Scholarship?

| Glassick* Criteria for Scholarship | Curriculum Development |
|---|---|
| Clear Goals and Aims | Goals & Objectives (III) |
| Adequate Preparation | Problem ID/GNA (I), TNA (II) |
| Appropriate Methods | Educational Strategies (IV) |
| Significant results | Evaluation (VI) |
| Effective Presentation | ? *Dissemination* |
| Reflective critique | Evaluation (VI) |

*Glassick CE, Huber MR, Maeroff GI. Scholarship Assessed: Evaluation of the Professoriate. 1997; San Francisco, CA: Jossey-Bass.*
*Glassick CE. Boyer's expanded definitions of scholarship, the standards for assessing scholarship, and the elusiveness of the scholarship of teaching. Acad Med. 2000;75(9):877-880.*




- Step 1: Problem Identification and General Needs Assessment

...building the foundation for meaningful objectives

# PROBLEM IDENTIFICATION & GENERAL NEEDS ASSESSMENT: WHY?

- Builds a rationale for one's curriculum
- Grounds it in patient and societal needs
- Focuses the curriculum's goals and objectives
- Which in turn focus the educational and evaluation strategies
- Prevents duplication of effort
- Makes you an expert and a scholar

# PROBLEM IDENTIFICATION

## Identify and Characterize the Health Care Problem That Will Be Addressed by the Curriculum

### Whom does the problem affect?

- Patients
- Society
- Health Care Professionals
- Learners

### What does the problem affect?

- Clinical Outcomes
- Quality of Life
- Quality of Health Care
- Use of Resources
- Medical & Non-medical Costs
- Patient & Provider Satisfaction
- Work & Productivity
- Societal Function

# *Example:* Problem Identification

"We need a curriculum on professionalism for our students."

*becomes*: "Why is it important for future health care providers, regardless of intended specialty, to understand and behave professionally?"

- What are the critical, evidenced-based or agreed upon elements of professionalism?
- What is the epidemiology of unprofessional behaviors in providers?
- How do unprofessional behaviors affect healthcare outcomes, team function, patient and societal trust?
- Which professionalism behaviors are most relevant for our students?

# GENERAL NEEDS ASSESSMENT

What is **currently being done** about the problem?

What is **the ideal approach** to the problem?

- By society at large?
- By patients?
- By health care professionals?
- By health professional educators?

# PI AND GNA:
# OBTAINING THE INFORMATION (1)

- Review of Available Information
  - Published Literature: PubMed, ERIC, CINAHL,BEME
  - Accreditation Bodies: e.g.  AAMC, LCME, ACGME, AACN, NLN
  - Professional Societies: e.g. National Academy of Medicine (Formerly Institute of Medicine - IOM), subspecialty societies
  - Government Databases and Reports
  - Curriculum Documents from other institutions: AAMC CI, MedEdPortal, FOAMed
  - Patient education materials prepared by foundations

# PI AND GNA:
# OBTAINING THE INFORMATION (2)

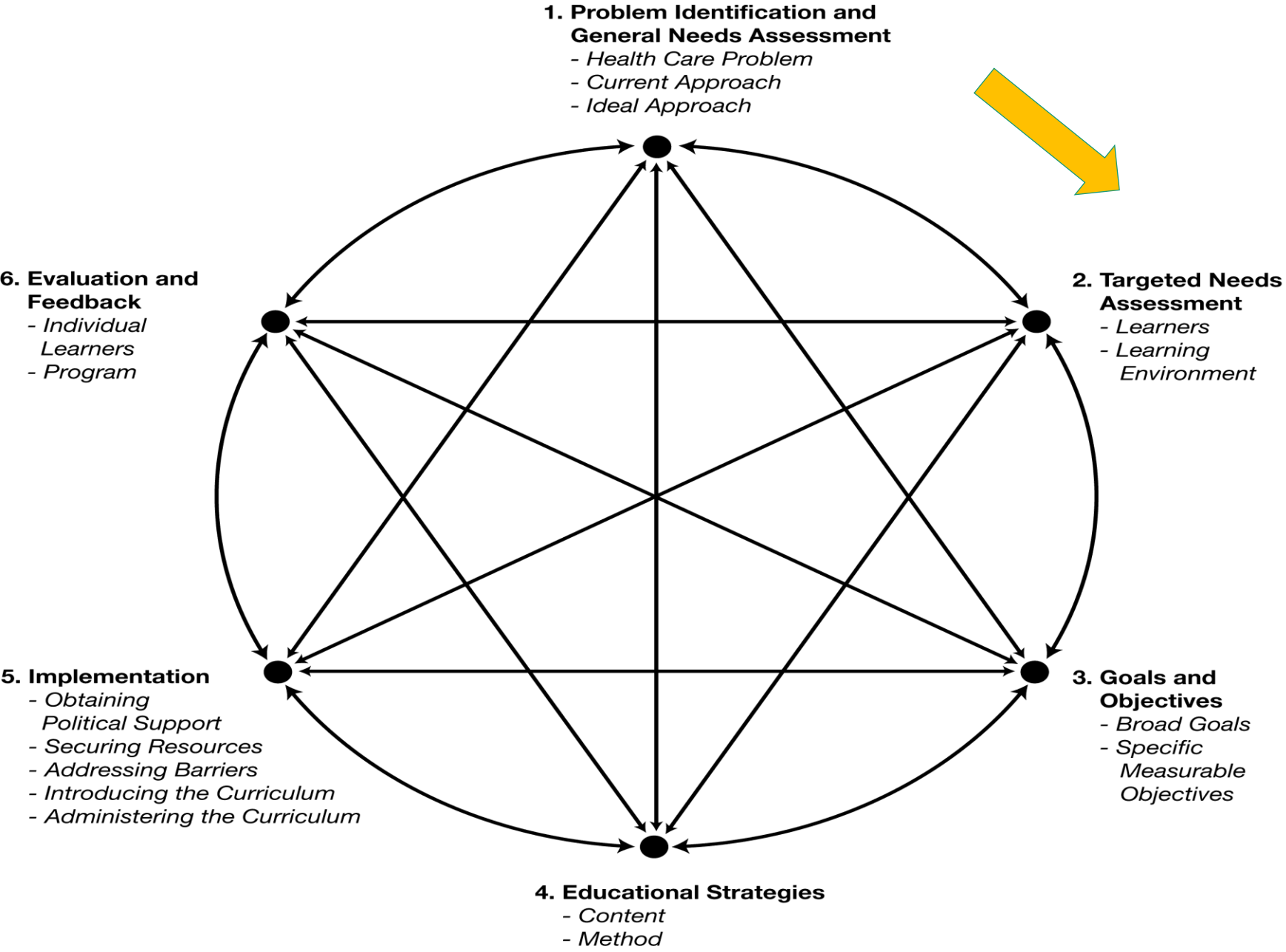
- Use of Consultants / Experts
  - Informal consultation
  - Formal consultation
  - Expert consensus meetings

# PI AND GNA:
# OBTAINING THE INFORMATION (3)

- Collection of New Information
  - Surveys
  - Focus Groups
  - Time/Motion studies/observations
  - Critical incident reviews
  - Studies of ideal performance cases/role models

# SUMMARY: STEP 1

- Grounds curricular work in patient, societal and learner needs
- Provides a rationale for generalizability
- Addresses at least two criteria for scholarship: adequate preparation and reflective critique
- Provides a foundation for meaningful goals and objectives
- Helps build a strong and rational argument for one’s curricular work.




## Step 2: Targeted Needs Assessment

*… refining the foundation*

# DISTINGUISHING STEPS 1 & 2

**Step 1: Problem Identification & General Needs Assessment**

**Step 2: Targeted Needs Assessment**

Source: (L) hiclipart.com; (R) vectortock.com

# Targeted NA: Why?

- Identifies the specific needs and preferences of targeted learners and other stakeholders, which may be different from learners and stakeholders in general.
- Assesses the environment (including the hidden and informal curriculum) which will likely influence behavioral / performance outcomes.
- Permits tailoring the educational intervention to specific needs.
- Increases efficiency, prevents duplication.
- Builds relationship with stakeholders.
- Aligns strategy with resources.

## Targeted Learning Environment

- ✓ Related existing curricula
- ✓ Hidden / informal curriculum
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- ✓ Resources
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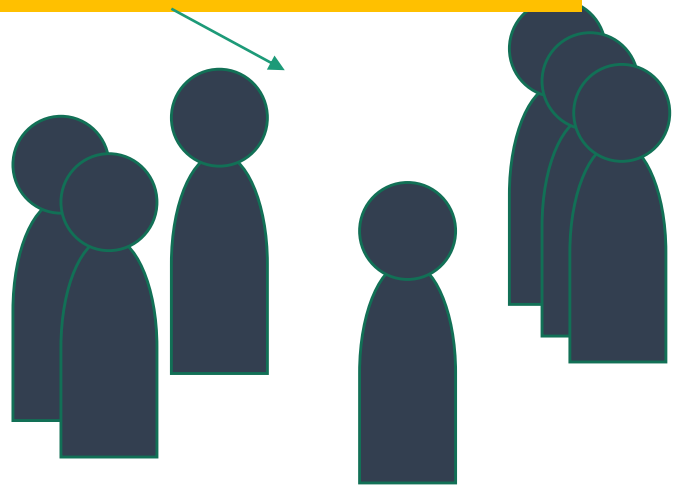
First, define your targeted learners



Targeted learners

Then, gather information about the learners and your targeted learning environment

- ✓ Previous training & experiences
- ✓ Existing proficiencies
- ✓ Current performance / behaviors
- ✓ Perceived learning needs
- ✓ Preferences

# TNA: METHODS FOR COLLECTING DATA

- Curriculum management systems / curricular mapping software
- Informal discussion with key informants
- Formal interviews
- Focus group discussions
- Questionnaires
- Direct observation
- Tests
- Audits of current behavior
- Strategic planning sessions for the curriculum with key stakeholders

# CONSIDERATIONS WHEN COLLECTING DATA

- Are data sources already available?
- How many resources should you devote to this process?
- Will the data obtained change or influence what you propose to do?
- What are the long term plans for using the information that is gathered?

# *Example:* Resuscitation Skills Curriculum

Methods for Collecting Information:

- Informal poll of JHUSOM med students regarding confidence in emergency response and resuscitation skills
- Review of existing curriculum: BLS, clinical rotations in ER/ICU/medicine
- Volunteer cohort of BLS-trained 4$^{th}$ year med students participated in a simulation scenario that depicted acute MI complicated by vfib arrest.

# *Example:* Resuscitation Skills Curriculum

Findings:

- Strong interest, high anxiety, low confidence
- Inadequate formal training
- Suboptimal performance even after BLS and exposure in clinical rotations
  - 45% initiated chest compressions within 1 minute
  - 58% placed a cardiac monitor
  - 25% initiated ventilation
  - 75% defibrillated within 3 minutes but many were inappropriate (wrong rhythm identification or not using accepted protocol).
- Opportunities: TTW acute care module and Simulation Center resources

Healthcare Problem: Too many children dying of dehydration from diarrheal illnesses

General Needs Assessment = Ideal Approach − Current Approach

| | Patients | Health Care Professionals | Health Professions Educators | Society |
|---|---|---|---|---|
| Current Approach | | | Teach abx/IVs S1-D1-T1 | |
| Ideal Approach | | | | |

Healthcare Problem: Too many children dying of dehydration from diarrheal illnesses

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| Ideal Approach | Use ORT | Teach ORT<br>Less abx use<br>IV skill | | Invest in ORT and sanitation |

Healthcare Problem: Too many children dying of dehydration from diarrheal illnesses

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| Current Approach | Nurse/feed ->hospital | Start abx/IV rehydration | Teach abx/IVs S1-D1-T1 | Invest in meds/wards |
| Ideal Approach | Use ORS/SSS | Teach ORT<br>Less abx use<br>IV skill | Teach ORT<br>Abx decision<br>IV access | Invest in ORT and sanitation |

# At the conclusion of Steps 1 & 2:

- You have a strong argument for the need for your curriculum.
- Set the stage for generalizability and dissemination of your curriculum.
- Understand the particular needs of your targeted learners and institution(s)
- Identified stakeholders, potential resources, support, and barriers.
- Have the introduction and elements of a discussion for a manuscript
- You are now the expert!

*Questions?*

# Small Group Exercise

# Presentations

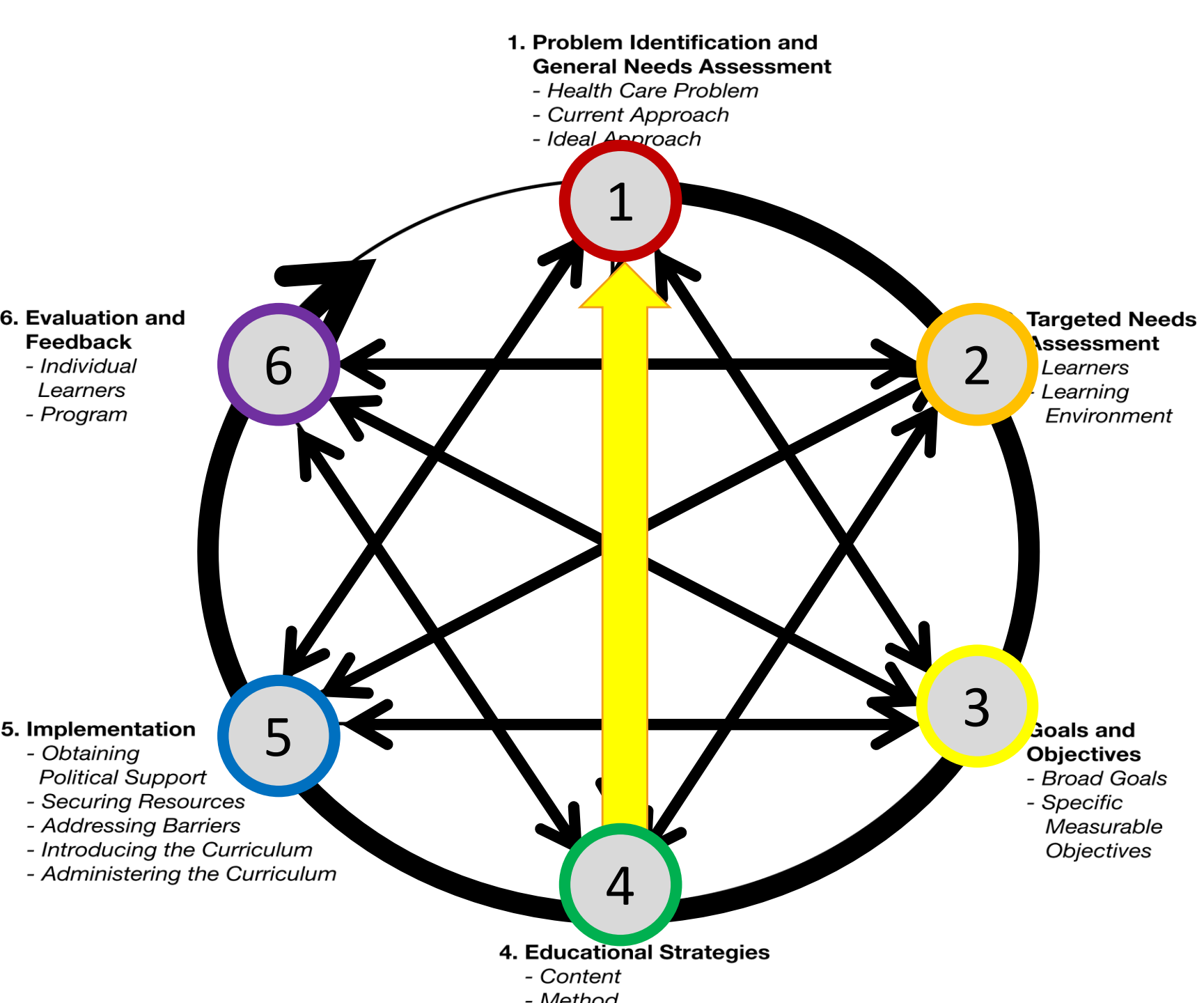
# Insights/Questions

# Closure

# WORKSHOP OBJECTIVES

By the end of the FCD workshop, participants will be able to:

- List the six steps of curriculum development
- Describe why the six-step approach is relevant for educational scholarship
- Describe the elements of Steps 1 & 2 (Problem Identification, General and Targeted Needs Assessment) and why they are fundamental to developing effective curricula
- Engage in applying Steps 1 & 2 to a curricular idea

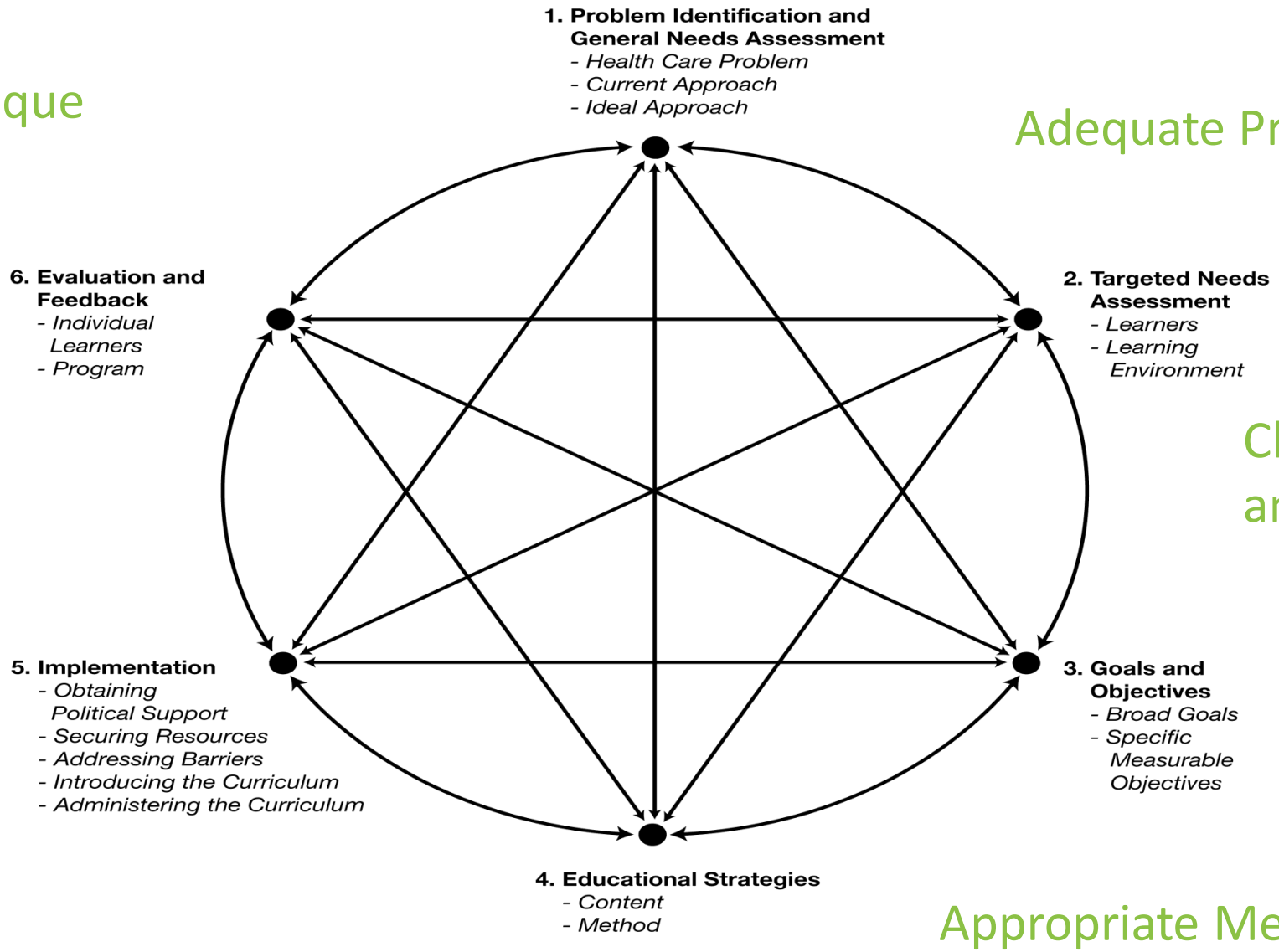



# The Curriculum Development Six-Step Dynamic Diagram

- Cyclical
- Interactive
- Oriented to health needs

Reflective Critique

Adequate Preparation




Significant Results

Clear Goals and Aims

Appropriate Methods

# WORKSHOP OBJECTIVES

By the end of the FCD workshop, participants will be able to:

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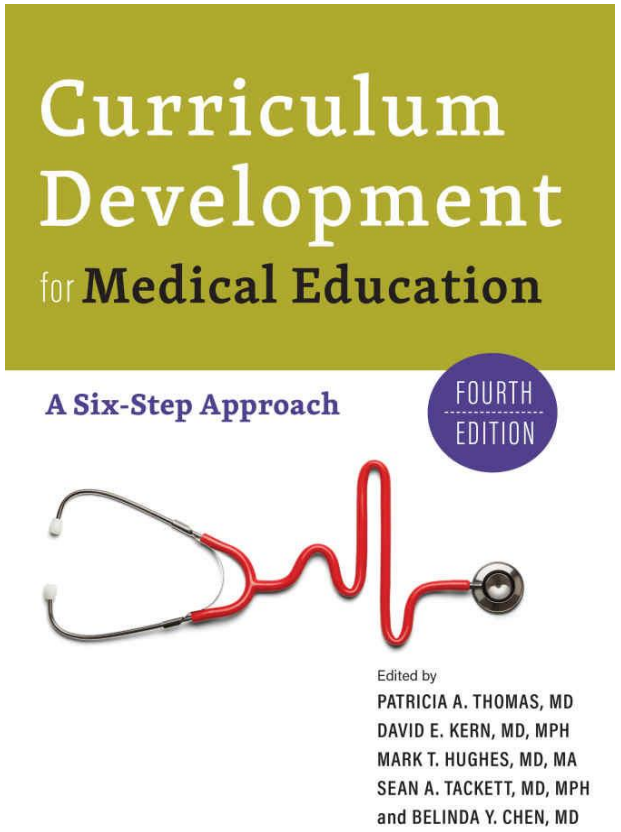
- Engage in applying Steps 1 & 2 to a curricular idea
- *Identify additional resources for curriculum development*

# RESOURCES: Textbook




Thomas PA, Kern DE, Hughes MT, Tackett SA, Chen BY, eds. Curriculum Development for Medical Education: A Six-Step Approach. 4th ed. Baltimore (MD): Johns Hopkins University Press; 2022.

# RESOURCES: Johns Hopkins FDP Other workshops and support

- Introduction to CD Online course
- Foundations of CD: ½ day workshop
- Principles and Practice of CD: 2-day workshop
- Longitudinal CD course
- CD Practicum: mentorship for a project

# RESOURCES: Johns Hopkins FDP Longitudinal Program in CD

- 10 Months (Sept – June)
- Workshops on Each Curricular Step
- Sessions on Literature Searching, Survey Design, IRB, Online Education, Searching for Funding, Simulation Center, Using Technology, Dissemination
- Mentored Group Project
- Individual Meetings with Facilitators, Written Feedback on Each Step
- Work-in-Progress Sessions
- Written Paper / Curriculum and Oral Presentation

# RESOURCES:

Websites:

- Johns Hopkins Faculty Development Program: https://hopkinsbayviewinternalmedicine.org/programs/faculty-development-johns-hopkins-bayview-internal-medicine/
- ACGME: http://www.acgme.org/
- AAMC/LCME: http://www.lcme.org/
- MedEd Portal: https://www.mededportal.org
- Your professional organizations

Email:

- dkern1@jhmi.edu

# ADDITIONAL SLIDES

# HOW TO WRITE OBJECTIVES

- Achieve balance between specificity and readability
- Have someone else read them and explain them to you
- Have a manageable number of objectives

# *EXAMPLE:* Communication Objectives

- By the end of the curriculum, residents will be able to list the critical components of effective patient education:
  - assessing patient's/family member's knowledge, beliefs, needs
  - tailoring education to needs
  - giving information clearly and effectively
  - checking patients' comprehension and agreement.

Cognitive Objective

- By the end of the curriculum, residents will rate highly (compared to other roles) the physician's role to effectively educate patients/family members.

Affective Objective

# *EXAMPLE:* Communication Objectives

- By the end of the curriculum, residents will have demonstrated their proficiency in the above patient education skills.

Psychomotor Skill Objective

- By the end of residency, residents will routinely use these patient education skills in their practice.

Behavior Objective

# *EXAMPLE:* Communication Objectives

- By the end of the curriculum, each resident will have reviewed 3 video recordings of their actual patient interactions with their colleagues and a facilitator.

Process Objective

- Two months after the end of the curriculum, patients/family members of trained residents will be more satisfied with their physicians and be adherent to their prescribed medication regimen than patients of untrained residents.

Patient Outcome Objective

# *EXAMPLE:* Individual Learner vs. Program Objectives

Individual Learner
- By the end of the curriculum, each resident will have demonstrated proficiency in the above patient education skills.

Aggregate Program
- There will be a statistically significant and meaningful increase in proficiency in patient education skills among residents who have taken the curriculum.

Program Objective
- Residents will rate the curriculum highly compared to other curricula and recommend the curriculum to their colleagues as an outstanding or good experience (as opposed to satisfactory or not recommended).

# REMEMBER

- Goals provide overall direction
- A manageable number of objectives should
  - interpret the goals
  - focus and prioritize curricular components

Caveats

- Most curricula encompass more than the sum of their written objectives
- Objectives can be written to encourage creativity, flexibility, and nonspecified learning relevant to curricular goals

# Task IV. IDENTIFY EVALUATION QUESTIONS

- Ensure that some evaluation questions are congruent with curricular objectives.
- Include some evaluation questions that do not relate to specific curricular objectives. (program evaluation).
- Include some that are open-ended in nature.
- **Prioritize and select key evaluation questions, based upon user needs and feasibility.**

# Task V. CHOOSE EVALUATION DESIGNS

- Choose an evaluation design congruent with the evaluation question.

- Choose an evaluation design that is feasible in terms of resources.

# Task V. COMMON EVALUATION DESIGNS

- Posttest

  X ---- O

- Pretest-Posttest

  $O_1$---- X ---- $O_2$

- Control/Comparison Group

  E ($O_1$---) X ---- $O_2$

R C ($O_1$---)-------- $O_2$

X = Intervention
O = Observation
E = Exposed/Experimental
C = Comparison/Control
R = Randomized

## *EXAMPLE: Evaluation Design Congruency*

- Do residents' communication skills improve following training?

$$O_1 \text{---- } X \text{ ---- } O_2$$

- Are they superior to those of untrained residents?

R E X ---- $O_2$

C ----- $O_2$

## *EXAMPLE: Evaluation Design Congruency*

- How do residents rate the curriculum and its various components?
- What are its strengths?
- How can it be improved?

X ---- O

# Task VI: Choose Measurement Methods & Construct Instruments

- Choose measurement methods that are congruent with educational objective and/or evaluation question.
- Choose measurement methods that are feasible in terms of available resources.

# Task VI: Choose Measurement Methods Qualitative vs. Quantitative

| | Qualitative | Quantitative |
|---|---|---|
| Intent | Discovery of Theory | Verification of Theory |
| Scope | Holistic, Rich in Context | Particularistic |
| Measurement | Qualitative Data | Quantitative Data |
| Data Gathering | Semi-structured or unstructured response options | Fixed response options |
| Analytical Techniques | Inductive | Deductive |

Adapted from Green and Lewis, 1986

See also: Castillo-Page, Laura PhD; senior director; Bodilly, Sue PhD; senior director; Bunton, Sarah A. PhD; research director AM Last Page, Academic Medicine: March 2012 - Volume 87 - Issue 3 - p 386
doi: 10.1097/ACM.0b013e318247c660

# VI: Choose Measurement Methods: Congruence

| | Knowledge | Attitude | Skill / Behavior |
|---|---|---|---|
| Learner | Oral exam<br>Written exam<br>Questionnaire<br>---<br>Problem or case-based examination<br>---<br>Global rating scales | Learner interview<br>Questionnaire<br>Self-evaluation<br>Narratives<br>---<br>Global rating scales | Direct observation<br>Audio/video review of recorded performance<br>---<br>Record audit<br>Outcomes of care<br>Patient interview<br>---<br>Self-evaluation<br>Global rating scales |
| Program | Aggregated scores from above methods | | |

# Hierarchy of Evaluation Strategies

- *Outcomes measured*: patient/health care > behaviors/performance > skills > knowledge or attitudes > satisfaction or perceptions
- *Measurement methods*: objective > subjective; more > less evidence of reliability and validity
- *More > less strong evaluation designs*: randomized controlled > controlled > before-after > post only; longer > shorter term follow-up after intervention

# IDEAL EVALUATION STRATEGY

- multiple measurements
- multiple measurement methods
- multiple raters

When all results are similar, the findings are said to be *robust*, and one can be reasonably comfortable about their validity.

# *Example:* Problem Identification

"We need a curriculum to teach our pediatric residents to address parental vaccine hesitancy

*becomes*: "Why is it important for pediatricians to be able to address parental vaccine hesitancy?

- What is the impact on the process of care?
- What is the impact on clinical outcomes?
- What is the impact on malpractice?
- What is the impact on utilization and costs?
- What is the impact on patient and provider satisfaction?