TGfU 40th Anniversary Webinar Series: Introduction to Game-Based Approaches

Seminar #3:

Topic 3: Questions and Reflection

Topic 4: Assessment

October 15th, 2022

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5 Critical Components for learning to teach and coach GBA

1. Tactical Concepts/Problems
2. Games Modifications
3. Using Questions and Reflection
4. Authentic Game Play and Assessment
5. Lesson Planning

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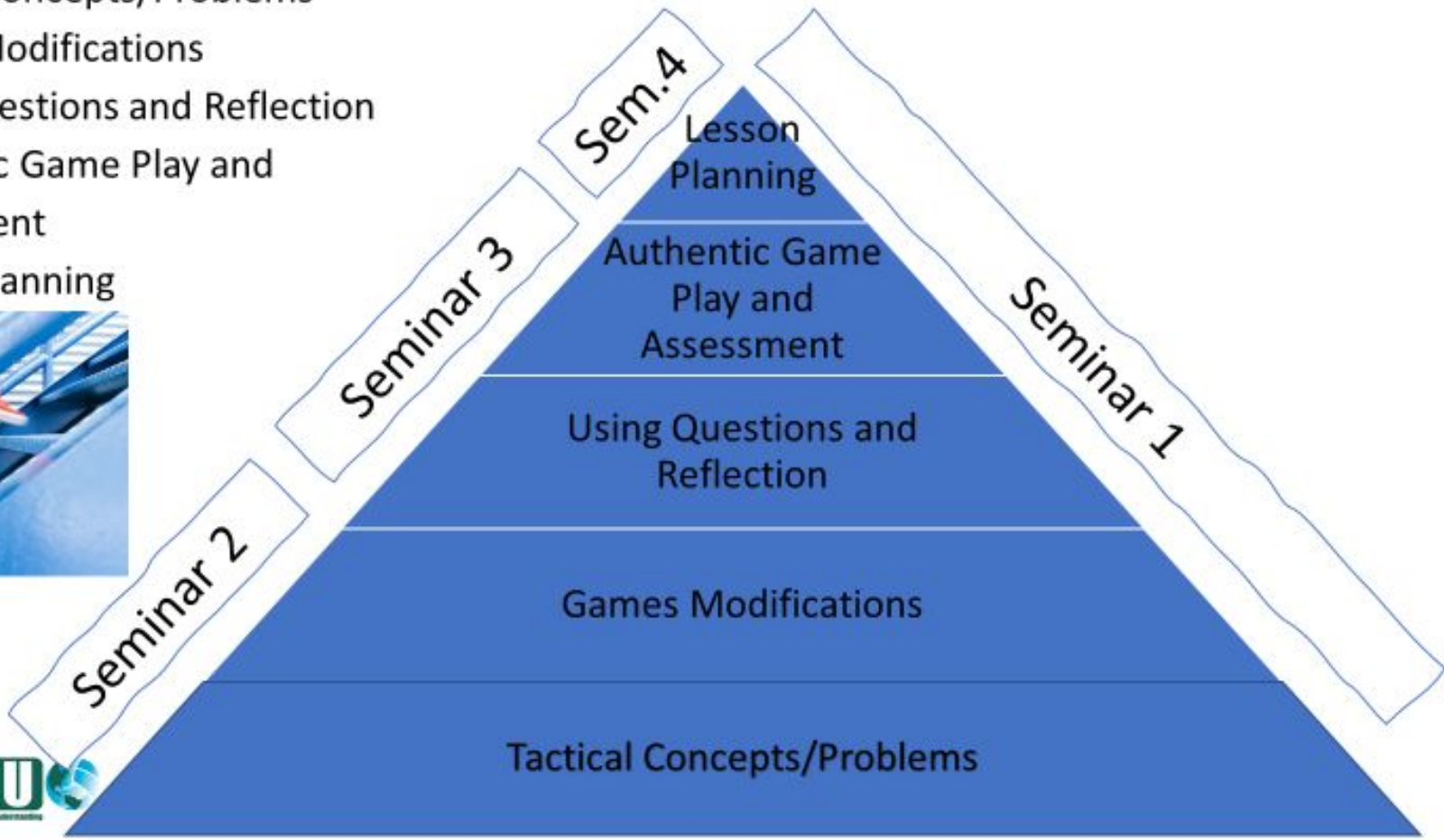

Today's Presenters from IAB

Naoki Suzuki (Japan)

Francesco Sgrò (Italy)

Aspasia Dania (Greece)

Kanae Haneishi (USA)

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Outline

- Topic 3: Question and Reflection
- Topic 4: Game Play Assessment
- Questions

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Topic 3: Question and Reflection

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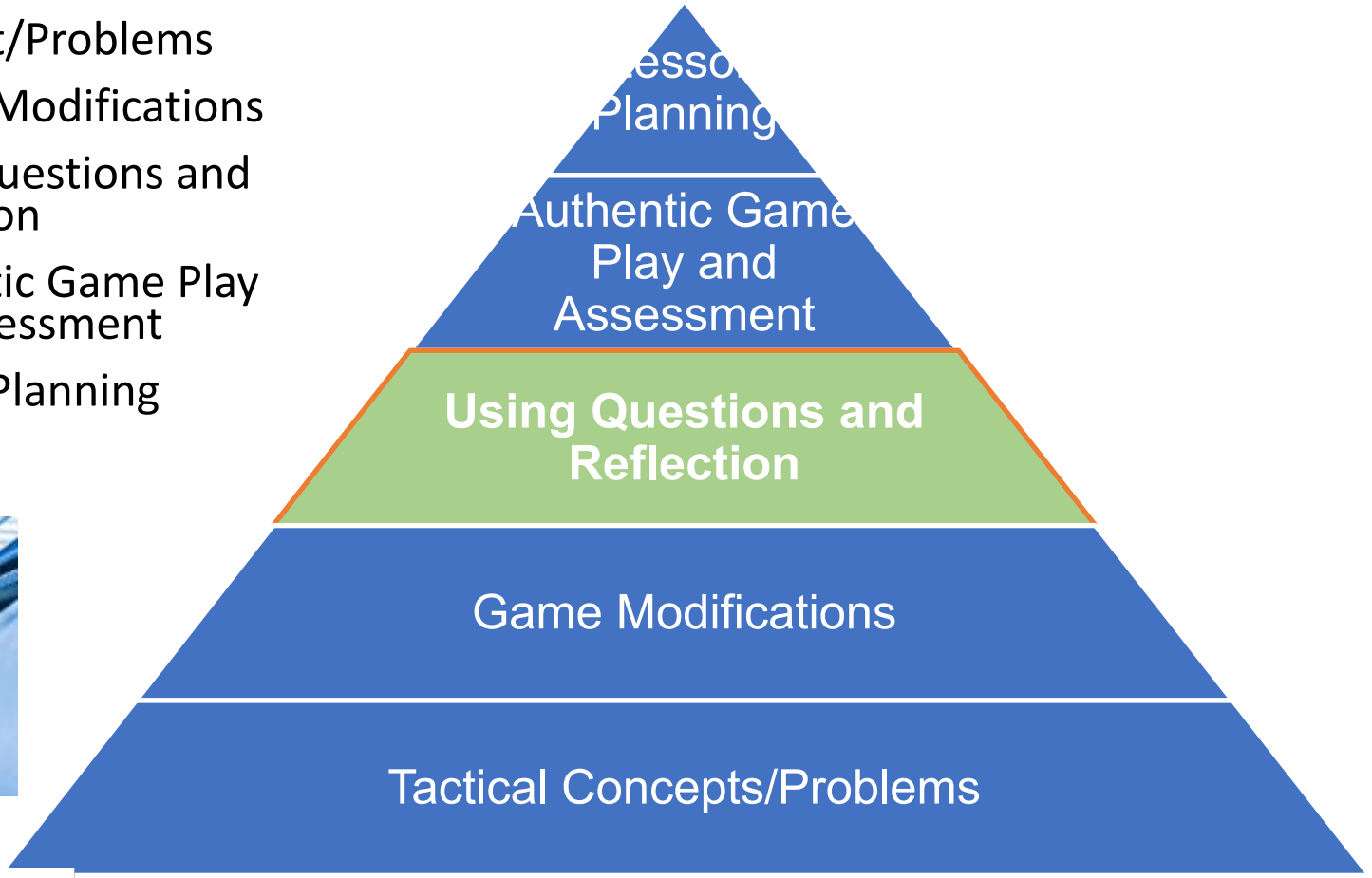

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Topic 3: Question and Reflection

- GBA uses “Questioning” technique to guide students to solve tactical problems rather than providing them answers.
- The cognitive process that you are guiding the students on are very important not only for gaining knowledge but also for improving the performance.

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Topic 3: Questioning as Teaching

- Tactical awareness: “what do you…?”
- Skill and movement execution: “How do you…?”
- Time: “When is the best time to …?”
- Space: “Where is …?”
- Risk: “Which is the best choice between…?”

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Topic 3: Questioning - Example of Volleyball 3 v 3 Game

- Teacher: “What did you do to contain the ball on your side of the net? (tactical awareness)
- Student: “Hit the ball high”.
- Teacher: “Where would be the best place to pass the ball?” (space)
- Student: “The middle of the court”.
- Teacher: “How did you hit the ball to keep control?” (skill selection and execution)
- Student: “We used our hands (overhead pass) or bumped it using our forearms (forearm pass)”

Problem-Solving Skills

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Topic 3: Asking Effective Questions

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Questioning in Game Based Approaches

Socio-Cognitive Practice

- ✔ Knowledge about technique & tactics
- ✔ Game Sense
- ✔ Problem Solving
- ✔ Inquiry Learning
- ✔ Cooperative learning
- ✔ Self monitoring

(Evans, 2012, 2014; Launder, 2001; Light, Harvey, & Mouchet, 2014; Light & Fawns, 2003; MacPhail, Kirk, & Griffin, 2008)

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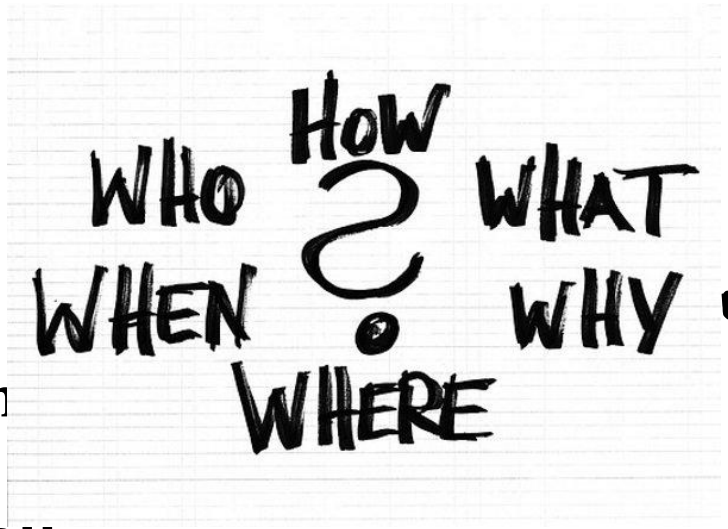
USING QUESTIONS TO TEACH IS AN OLD-AGE INSTRUCTIONAL PRACTICE

Socratic Method

Using leading questions and answers to form inferences and conclusions

- Promote **comprehension**
- Stimulate **knowledge recall**
- Build **critical thinking skills**



Effective instructional method:

- ✔ Medical Education,
- ✔ Language & Mathematics teaching
- ✔ Physical Education & Coaching

(Hill, 2012; Martens, 2004; Mosston & Ashworth, 2008; Sachdeva, 1996; Schell, 1998; Tienken, Goldberg & DiRocco, 2010)

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Educational benefits of Questioning

- **Motivation** (Can help maintain attention)
- **Retrieval (**Produce superior performance)
- **Feedback** (Repeat, prompt, scaffold)
- **Independent learning**
- Link between the **cognitive and social aspects of learning**

(Cazden, 2001; Gee & Green, 1998; Fairclough, 2013; Prain & Hickey, 1995; Prain & Tytler, 2013; Rothkopf, 1982; Surber, 1992; Thalheimer, 2003).

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Areas of learning affected by Questioning

Critical Thinking

(Godfrey, 2001; Pate & Miller, 2011; Seker & Komur, 2008)

- Generation of **novel ideas**
- Better scores in **problem-solving** activities

Subject – Matter learning

(Campbell & Mayer, 2009)

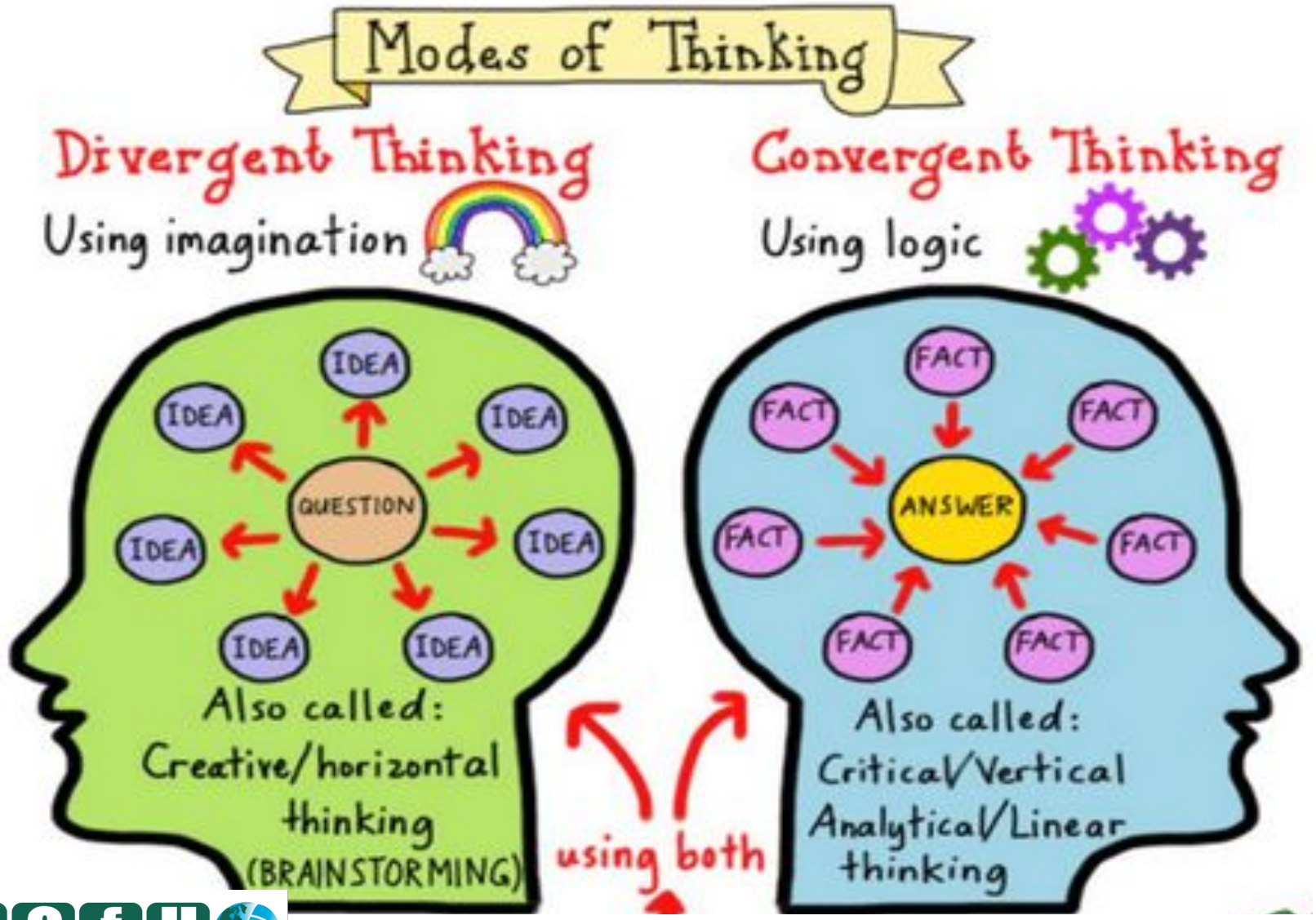
- Students who received lectures with **multiple choice questions** outperformed students who received lectures only with statements

Metacognition

(Byun, Lee & Cerrreto, 2014; Choi, Land & Turgeon, 2005; Deed, 2009)

- **Peer Questioning** and **scaffolding** facilitate reflective thinking and metacognition
- Instructor generated **prompts** are effective in promoting metacognitive skills

Taxonomies or classifications



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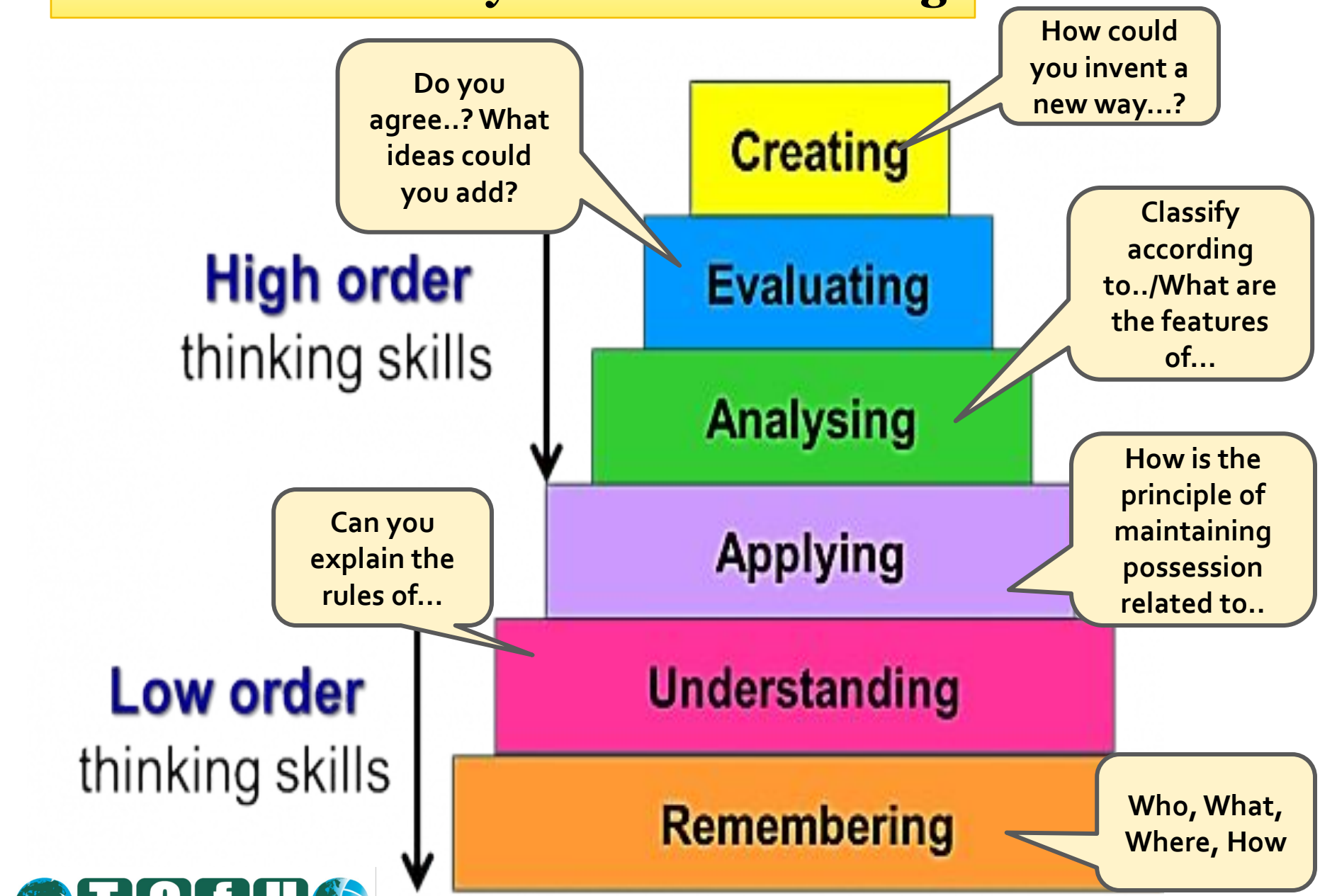
Bloom's taxonomy: Order of thinking



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Focus on: Response type

Response type correlates with increasing levels students' understanding

- **Prestructural**: no understanding
- **Unistructura**l: able to name and identify one aspect
- **Multistructural:** able to describe and combine multiple aspects
- **Relational:** able to explain, identify causes and effects
- **Extended abstract:** able to hypothesize & generate new ideas

(Biggs & Collins, 1982)

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Question Level/Order/Depth >>>

Thinking/Understanding Level/Order/Depth

Can there be a logically determined level of questions irrespective of subject and context?

The level of a question is

determined by the type of the

cognitive process which is needed

to understand and answer it,

taking into account the

learner's level of development and the

dynamics of the educational context

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- ✔ Higher cognitive questions **are not categorically better** than lower cognitive questions in eliciting higher level responses.
- ✔ **Lower** cognitive questions are **more effective** with **primary level children**.
- ✔ **Lower** cognitive questions are **more effective** when the teacher's purpose is to **impart factual knowledge**
- ✔ **A combination** of higher and lower cognitive questions **is superior** to exclusive use of one or the other.
- ✔ Increasing the use of **higher cognitive questions above 20%** produces **superior learning gains for secondary students**.

Christenbury & Kelly,1983; Ertmer, Sadaf & Ertmer, 2011; McComas & Abraham, 2012; Tofade, Elsner & Haines, 2013)

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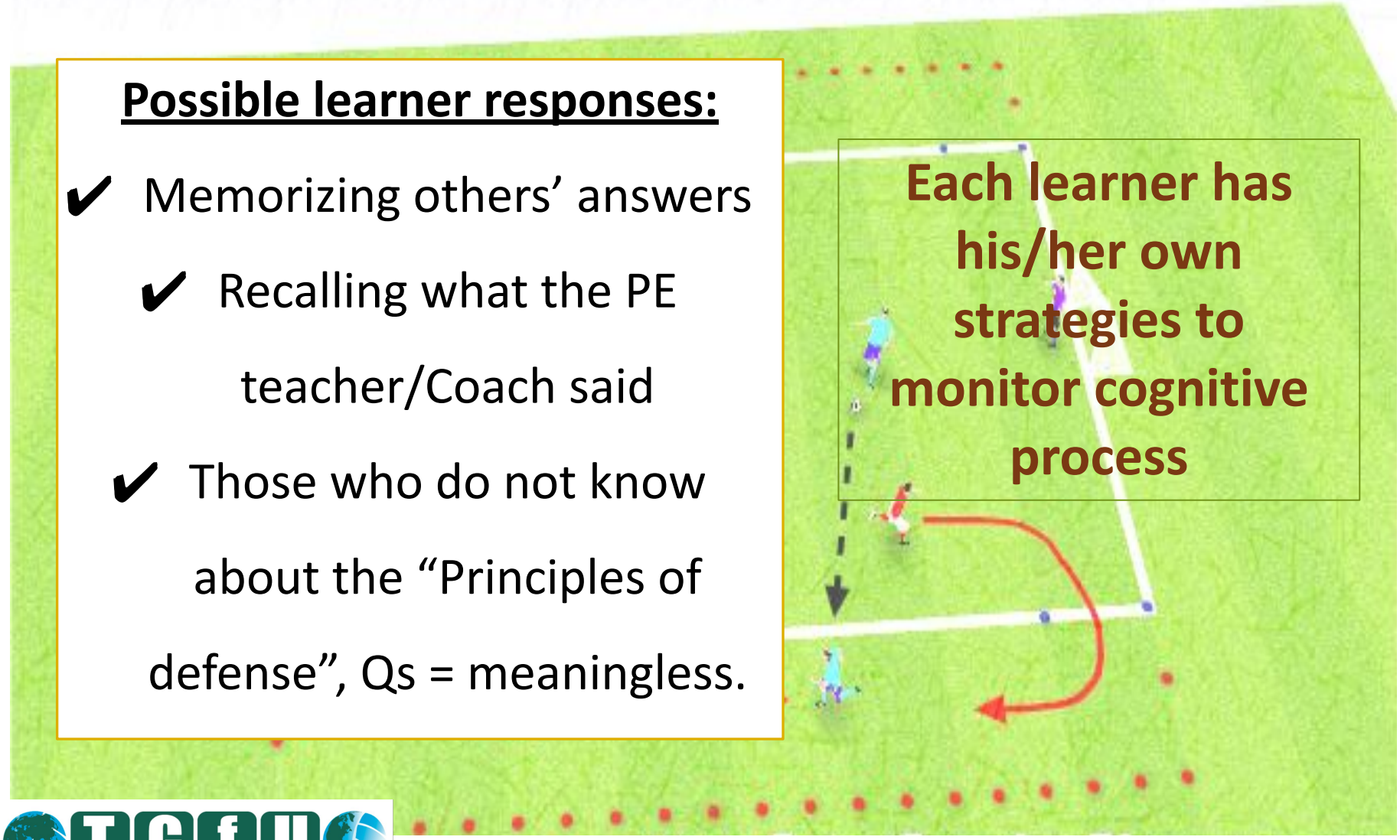
Q: Can you explain the causes of defense penetration ? (Low)
Q: What ideas could you add? (High)

Possible learner responses:

- ✔ Memorizing others' answers
- ✔ Recalling what the PE teacher/Coach said
- ✔ Those who do not know about the "Principles of defense", Qs = meaningless.



Each learner has his/her own strategies to monitor cognitive process

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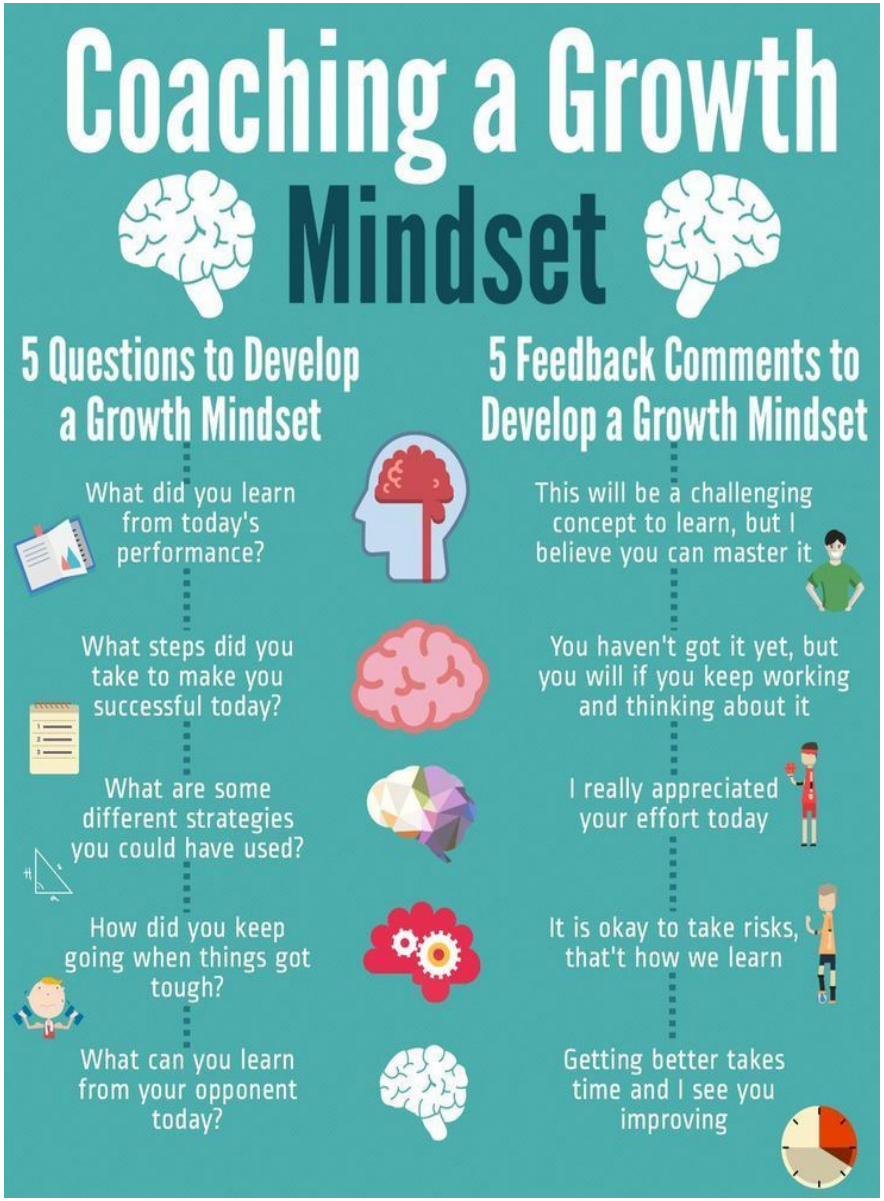
Questioning in GBAs
Pedagogical assumptions

1. No ONE-SIZE-FITS-ALL taxonomy of Questions

2. PE teachers and Coaches need to diagnose the level of learner's development and cognitive structure



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Principles of Mental Engagement

- **Contextual Interference**
  Games cognitive **challenges**

- **Mental Control**

Stopping (Inhibition)
Updating (Memory)
Switching (Flexibility)

- **Ability**

Open ended scenarios
Repetition without repetition
Meaningful **reflection**

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Eloranta & Jakkola, 2007; Tomporowski, McCullick & Horvat, 2010

Recycling process:
“teacher's question- students' responses- feedback”

Diagnosing
Grasping the learner’s level of development & cognitive structure

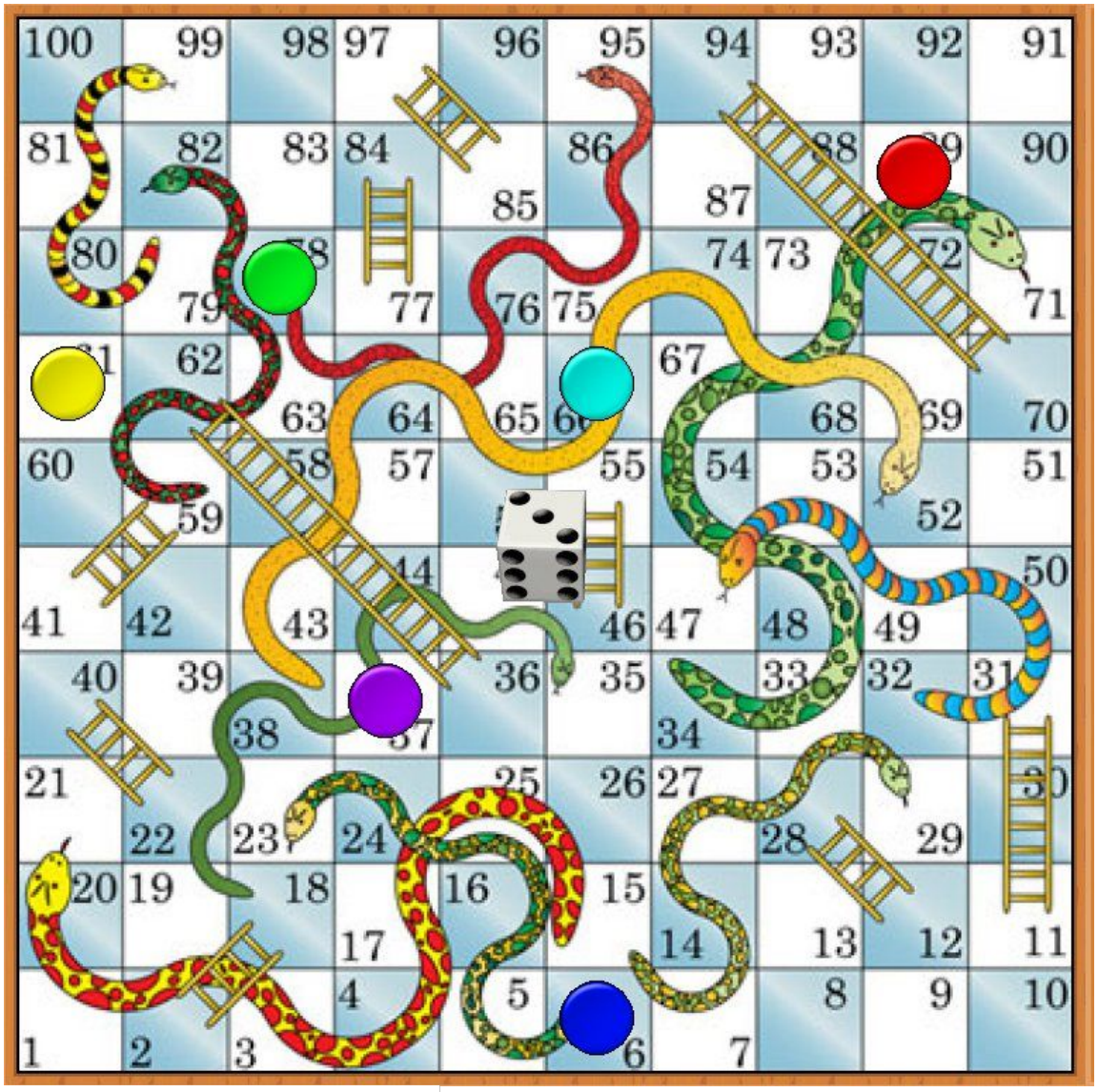
Dissolving
Additive accumulation of knowledge

Illustrative
Help students learn to ask questions

Relationships between problem solving and problem posing

(Dillon, 1990; Westgate & Hughes, 1997; Yang, 2002)

Questioning in GBAs



"Cognitive Ladder" to scaffold understanding

How?

(Chin, 2006)

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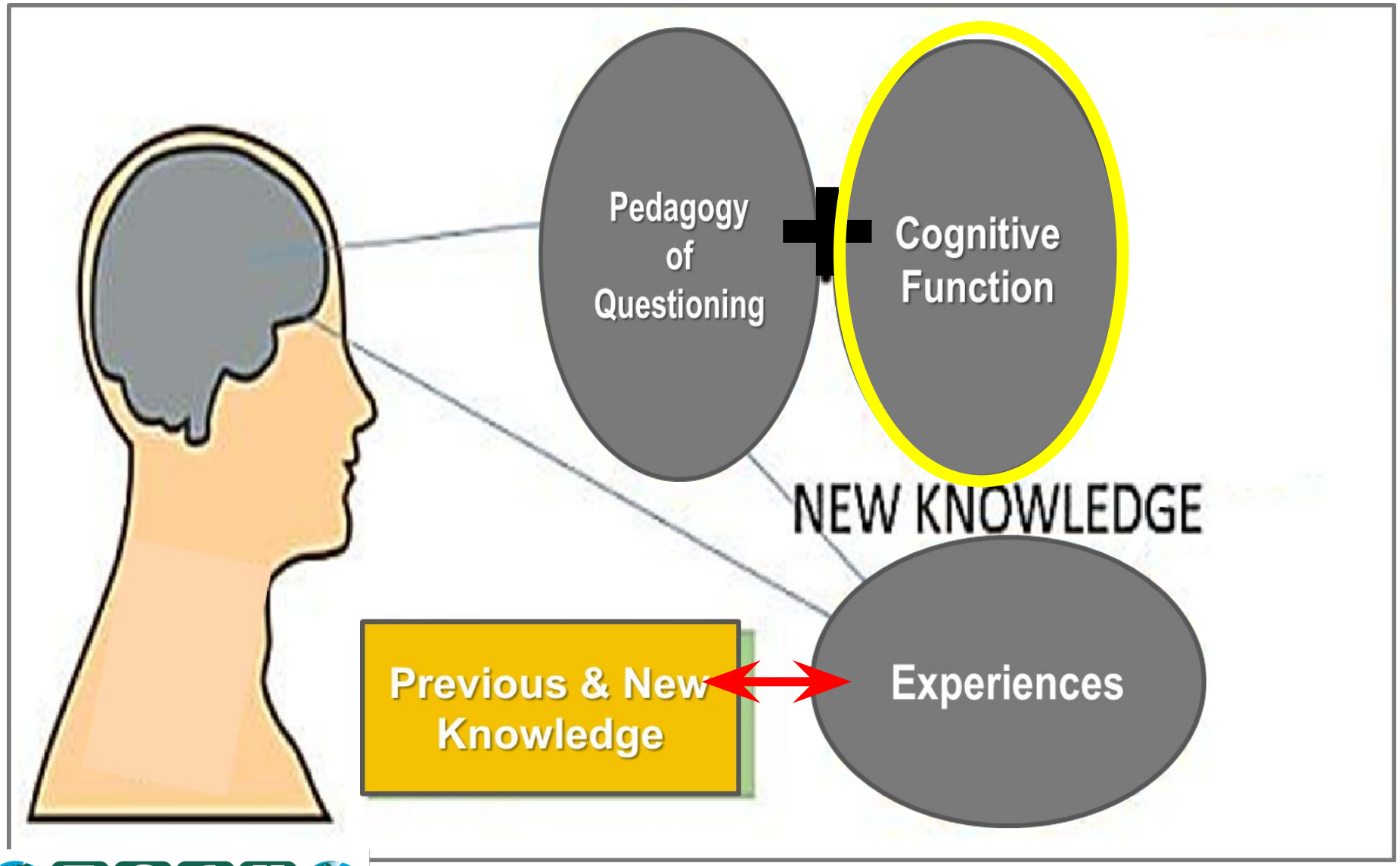
Questioning design & implementation:
Issues that have to be concurrently addressed



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Topic 4: Authentic Game Play Assessment

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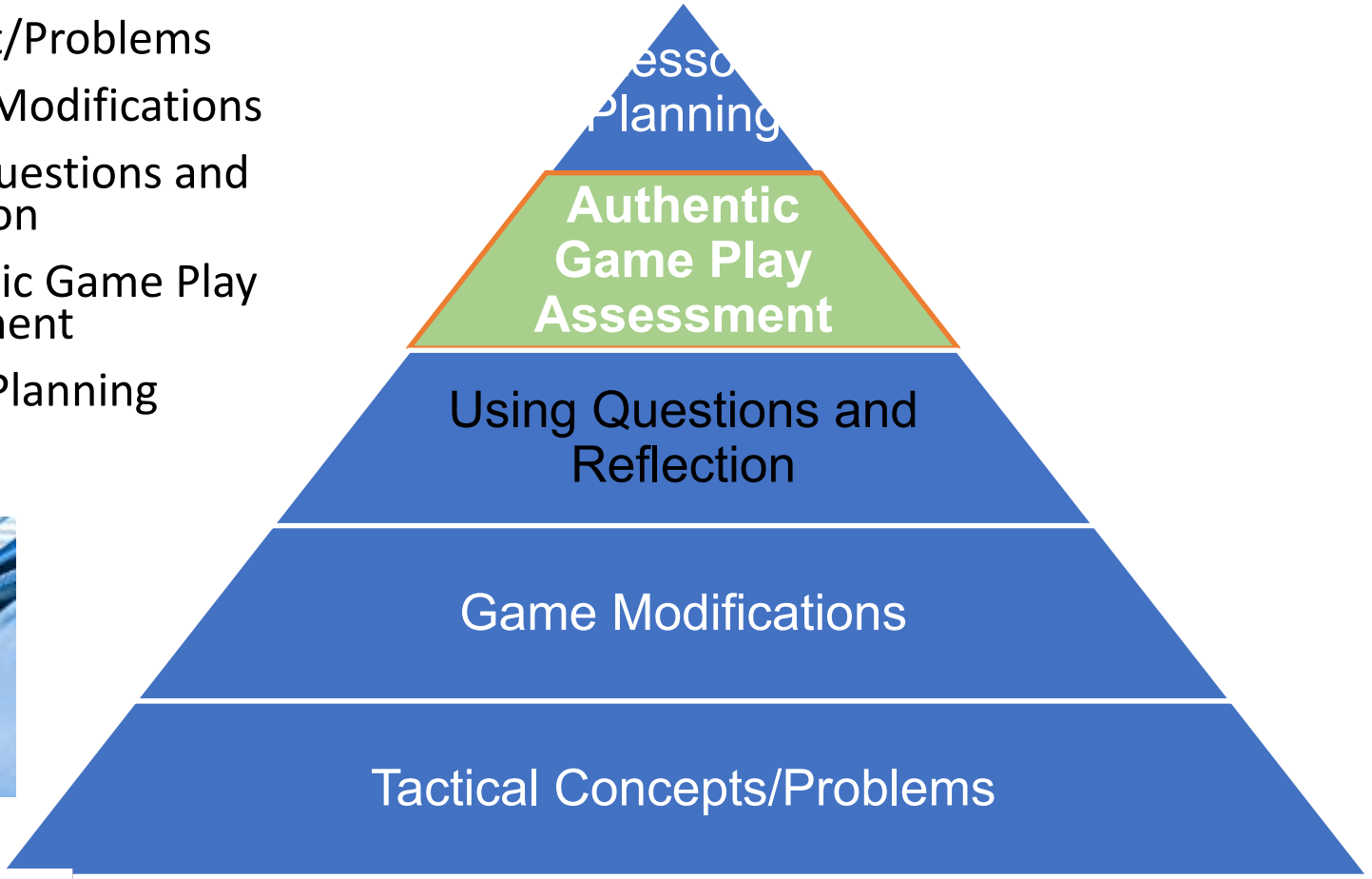

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Topic 4: Game Play Assessment

When using GBAs, assessment needs to:

1) assess gameplay skills within the game's context;
2) assess tactical awareness;
3) account for the social dimension of the game.

Topic 4: GPAI

- The **Game Performance Assessment Instrument** (GPAI) was mainly developed for school context
- GPAI can be used:
  - for assessing students/player across classification systems or across sport disciplines
  - for assessing how a player/students solves a specific tactical problem by means of the effective use of **decision-making**, **moving** and **goal-oriented skills**
  - for peer-assessment with the students of middle- and high-school.

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TOPIC 4: GPAI Components

Assessed Component	Description	Example
Base	A player returns to a proper position between skill attempts	**Tennis**: players return to center of the baseline after shooting
Decision making	A player chooses the proper movement or skill to execute in response to a tactical problem	**Soccer**: a player pass the ball to a teammate in a better position for shoot on goal.
Skill execution	Skill selection and execution are efficient to achieve the desired outcome	**Target**: a player hits the target with a bing bag toss
Supporting	A player support his teammates and will be ready to receive the ball and to efficiently continue the action (typical off-the-ball movement in invasion games)	**Soccer**: player move into an open position to receive the ball
Guarding	A player mark his opponent to deny them the ball or prevent them from scoring (defensive off-the-ball movement)	**Basket**: closing thee space under the basket to prevent a pass in that position
Covering	A defensive movement related to backup teammates to challenge or move out his zone for conqueror the ball.	**Volleyball**: covering teammates position themselves behind blockers to retrieve the balls that come off the block
Adjusting	Player adjust his position as the game requires.	**Target**: player adjust the angle of release based on where obstructing balls are lying.

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TOPIC 4: GPAI indexes

Following are examples of possible indexes from performance measures:

- **Decision Making Index (DMI):** appropriate decisions made/ (appropriate+inappropriate) decisions made
- **Skill Execution Index (SEI)**: efficient skills execution / (efficient+inefficient) skill executions
- **Support Index (SI)**: appropriate support movements / (appropriate+inappropriate) support movements
- **Game involvement** (**GI**): (appropriate+inappropriate) decisions made + (efficient+inefficient) skill executions + appropriate support movements
- **Game Performance (GP)**: (DMI + SEI + SI) /3

TOPIC 4: GPAI in action with soccer

GPAI component	Criteria
Decision making	Player attempts to pass to an open teammate. Player attempts to shoot when appropriate.
Skill execution	Reception—control of pass and setup of the ball. Passing—ball reaches target. Shooting—ball stays below head and is on target.
Support	Player appears to support the ball carrier by being in or moving to an appropriate position to receive a pass.

	Decision made		Skill execution		Support	
Name	A	IA	E	IE	A	IA
Matthew	xxxxxx	x	xxxxxx	x	xxxxxx	xxxx
Nicholas					xxx	xxx
Katie	xxxxx	x	xxxxx	x	xxxx	x
Jamal	xx	x	xxx	x	xxxxx	xx
Jenn	xxx	xx	xx	xxx	xx	x
Sasha	x	xx	x	xx	xxxxxxx	x

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TOPIC 4: GPAI in action with soccer

	Decision made		Skill execution		Support	
Name	A	IA	E	IE	A	IA
Matthew	xxxxxx	x	xxxxxx	x	xxxxxx	xxxx
Nicholas					xxx	xxx
Katie	xxxxx	x	xxxxx	x	xxxx	x
Jamal	xx	x	xxx	x	xxxxx	xx
Jenn	xxx	xx	xx	xxx	xx	x
Sasha	x	xx	x	xx	xxxxxxx	x

	Matthew	**Nicholas**	**Sasha**
DMI	6 / 7 = 0.86	0	1 / 3 = 0.33
SEI	6 / 7 = 0.86	0	1 / 3 = 0.33
SI	6/10 = 0.60	3 / 6 = 0.5	6 / 7 = 0.86
GI	7 + 7 + 6 = 20	0 + 0 + 3 = 3	3 + 3 + 6 = 12
GP	(0.86+0.86+0.6)/3 = 0.77	(0+0+0.5)/3 = 0.2	(0.33+0.33+0.86)/3 = 0.51

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Topic 4: TSAP

- The **Team Performance Assessment Procedure** (TSAP) was mainly developed for assessing students learning in authentic games situation.
- TSAP can be used:
  - as formative and summative assessment scenarios in which tactical learning was the main focus
  - for peer-assessment with the students of middle- and high-school.
  - only for assessing on-the-ball skills related to some sports (eg., soccer, volleyball, handball, hockey and basket)

TOPIC 4: TSAP Components

Assessed Component	Description
GAINING POSSESSION OF THE BALL	
Conquering the ball (CB)	interception, stealing the ball from the opponent, or recapturing the ball after an unsuccessful shot on goal or near-loss to the other team
Receiving the ball (RB)	Receiving the ball from a teammate and not immediately losing control of it
DISPOSING OF THE BALL	
Playing a neutral ball (NB)	Passing the ball to a teammate, or any pass that does not put the other team in jeopardy
Losing the ball (LB)	Losing the ball to the other team without having scored a goal
Playing an offensive ball (OB)	Passing the ball to a partner, thus pressuring the other team, which most often leads to a shot on goal
Executing a successful shot (SS)	Scoring or maintaining possession of the ball following the execution of a shot

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TOPIC 4: TSAP in action with basket

Table 1 - Performance indexes for TSAP

Outcome variables	Calculation
Volume of play (VP)	CB + RB
Efficiency index (EI)	CB + OB + (SS / LB) + 10
Performance score (PS)	(Volume of play / 2) + (efficiency index × 10)

SS = executing a successful shot
CB = conquering the ball
RB = receiving the ball
LB = losing the ball
VP = volume of play
OB = playing an offensive ball

Table 2 - Recording sheet for TSAP

Name	CB	RB	LB	NB	OB	SS
Kevin	5	7	2	5	4	6
Shelly	2	6	4	4	2	2
Karen	1	4	1	6	6	4

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TOPIC 4: TSAP in action with basket

Name	CB	RB	LB	NB	OB	SS
Kevin	5	7	2	5	4	6
Shelly	2	6	4	4	2	2
Karen	1	4	1	6	6	4

	Kevin	**Shelly**	**Karen**
VP	5 + 7 = 12	2 +6 = 8	1+ 4 = 5
EI	5+4+(6/2)+10 = 22	2+2+(2/4)+10 = 14.5	1+2+(2/4)+10 = 13.5
PS	(12/2) + (22*10) = 226	4+(14.5*10) = 149	2.5 + (13.5*10) = 137.5

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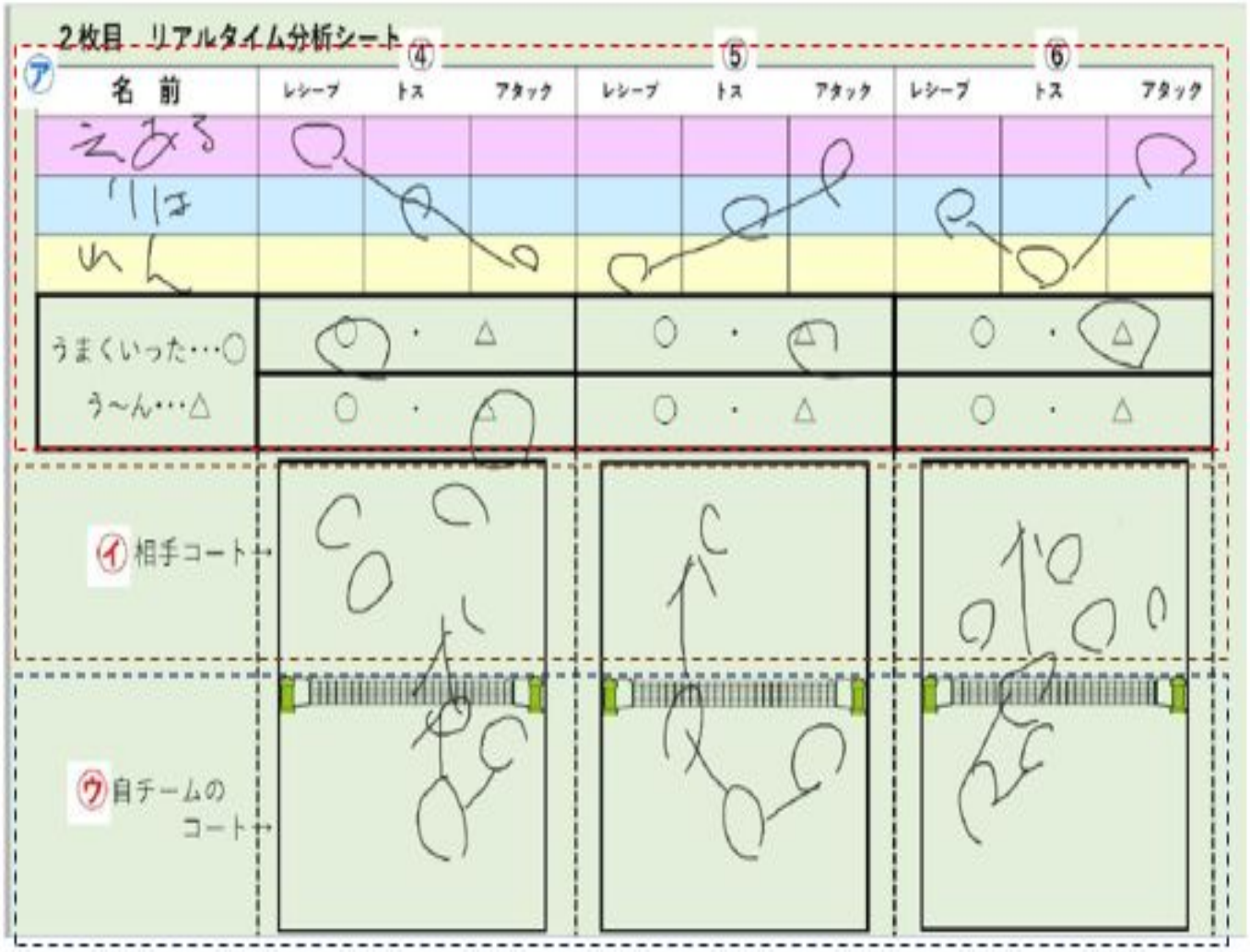
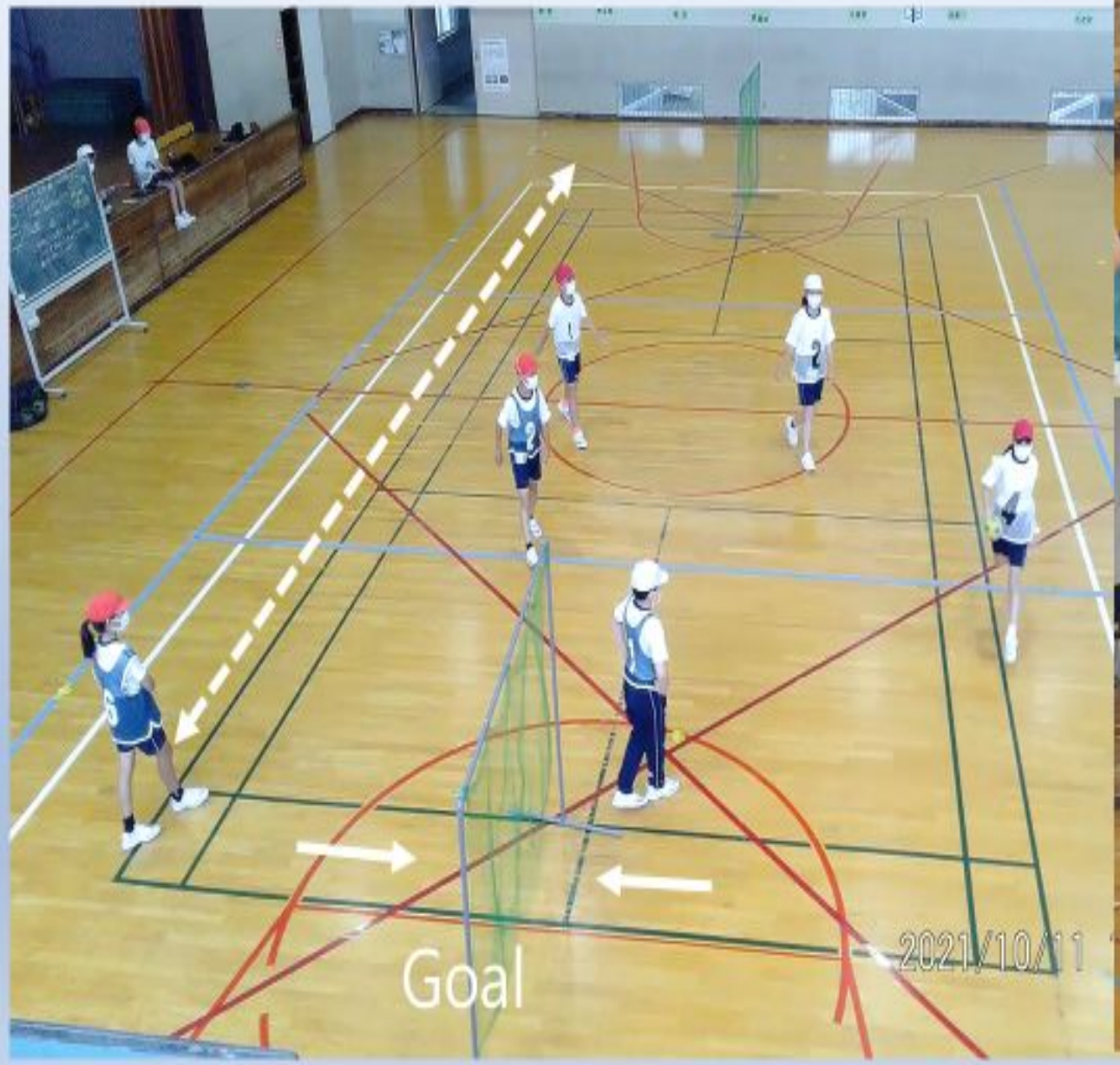
Check List

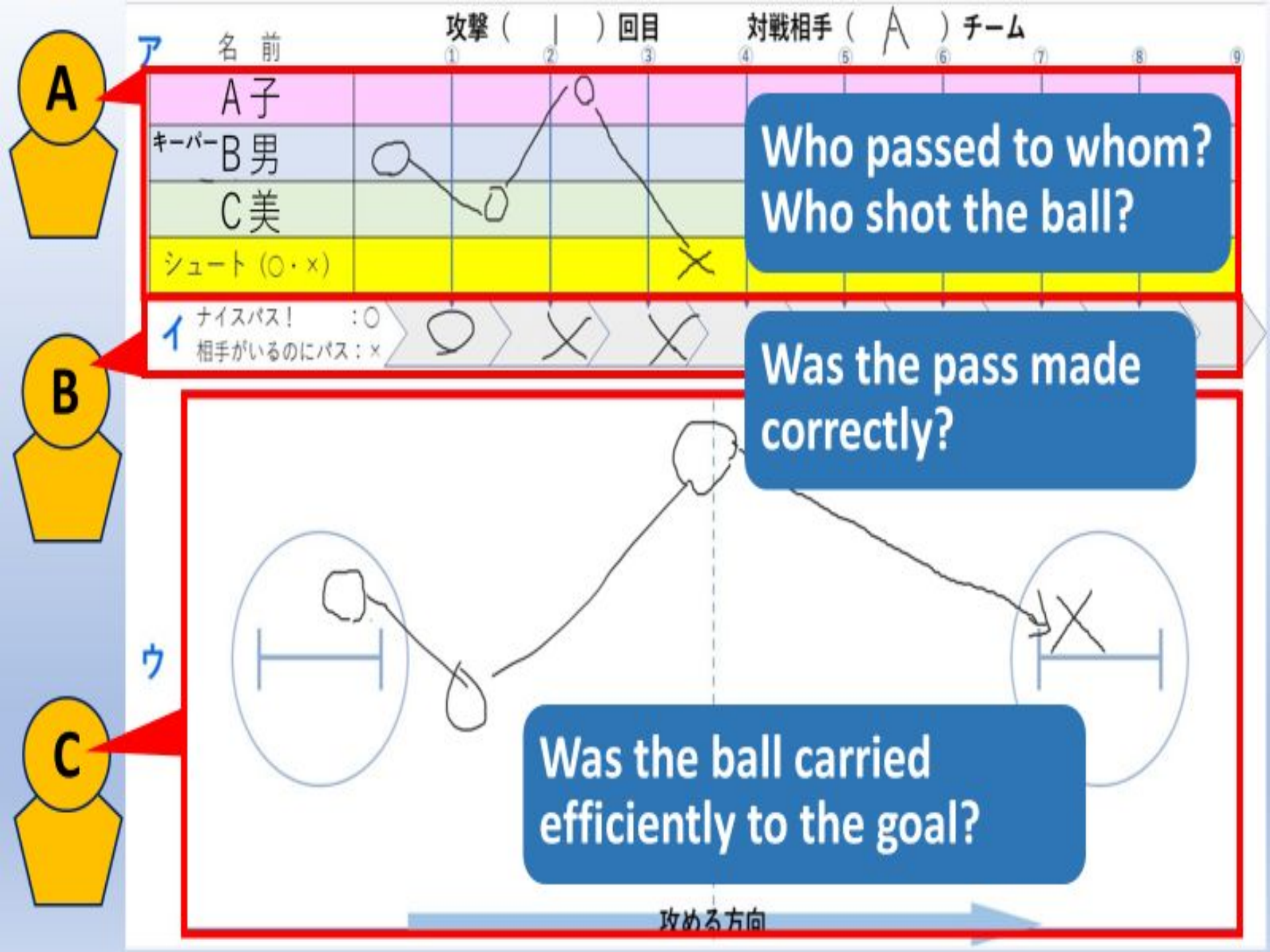
Collaboratively creating study cards and evaluating Game performance!

Mr. Hiroyuki Ono @ Murakami Elementary School, Niigata



Game: Players-Observers



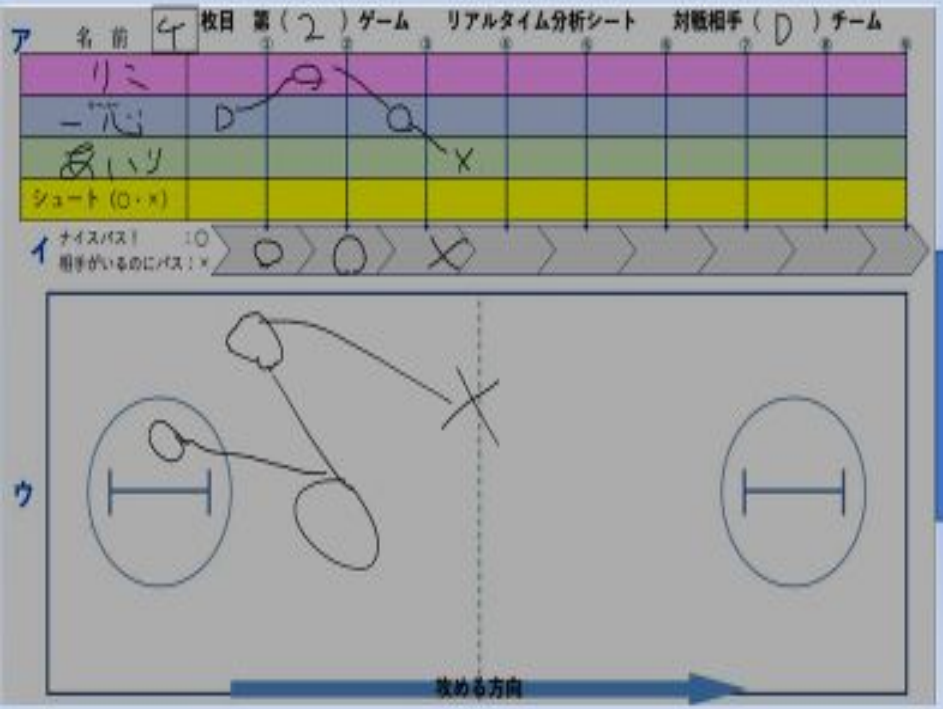

A
B
C
ア
名 前
攻撃 (|) 回目
対戦相手 (A) チーム
1
2
3
4
5
6
7
8
9
A子
キーパー B男
C美
シュート (○・×)
Who passed to whom?
Who shot the ball?
イ
ナイスパス！ :○
相手がいるのにパス：×
Was the pass made correctly?
ウ
Was the ball carried efficiently to the goal?
攻める方向

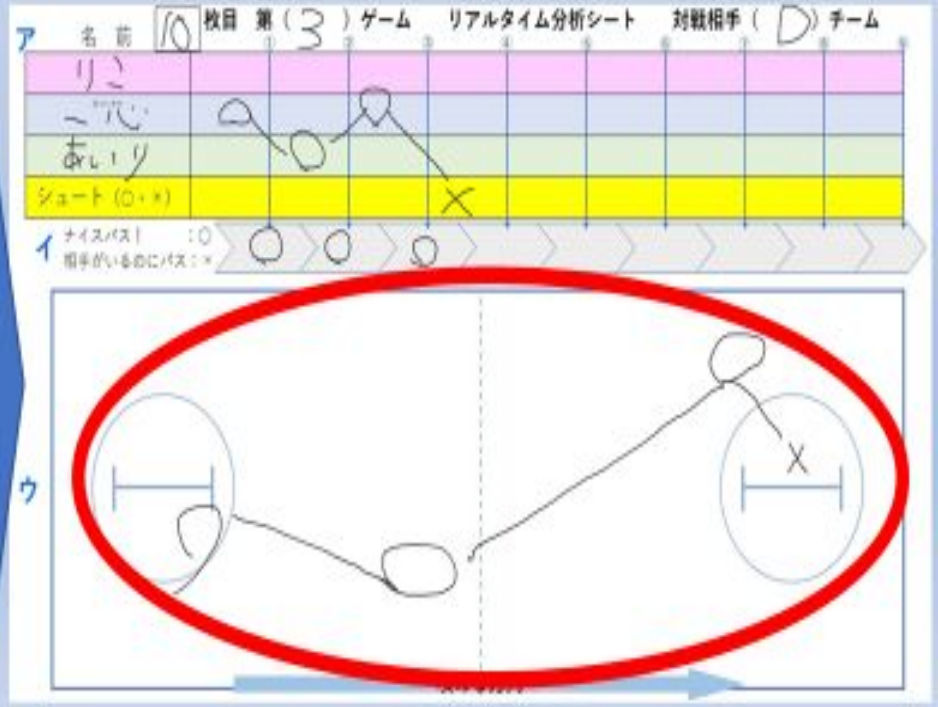
Changes in students using the e-assessment tool

A focus on making quick passes to nearby teammates.

C team

When we passed to a teammate nearby, we failed because we passed more often and it took longer.





Proposing a simple player-centered assessment instrument based on GCAI

Table.1 Comparing GCAI with GPAI (Suzuki, 2012)

	GPAI	GCAI
Domain	Complicated	Complex
Outcome	Performance	Contribution
Collecting	Picking Up	Understanding
Observation	Selective	Comprehensive
Data Type	Quantitative	Qualitative
Record	On sheet	On sheet / None
Recording Time	During Game	After Game
Function	Feed back	Feed forward

Table.2 Observation in GPAI & GCAI (Suzuki, 2012)

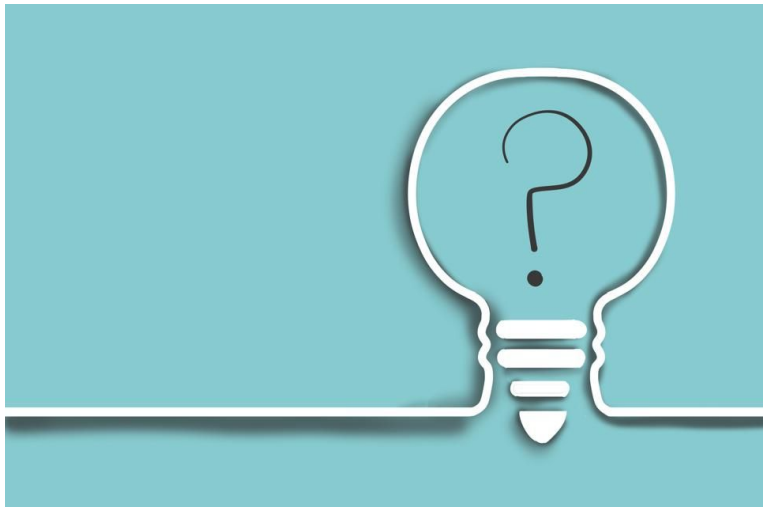
	GPAI	GCAI
Target:	Individual in Group	Individual in Game
Outcome:	Product as performance	Meaning for performance
Criteria:	Amount of appearance	Meaning for game
Assessing:	Counting the products	Interpreting the events

Assessment For Problem Solving

According to the students' reflections...

- Students were very positive about the new assessment instrument.
- The seamless of making standards and assessing is preferable for using it.
- The new assessment instrument was surprisingly easy for learners.
- Meta-cognition on the new assessment instrument promoted the ability for assessing performance.

Questions?



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Thank you for listening!

Next Seminar: October 29!

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