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Discovering the troublesome knowledge and threshold concepts of pharmacology

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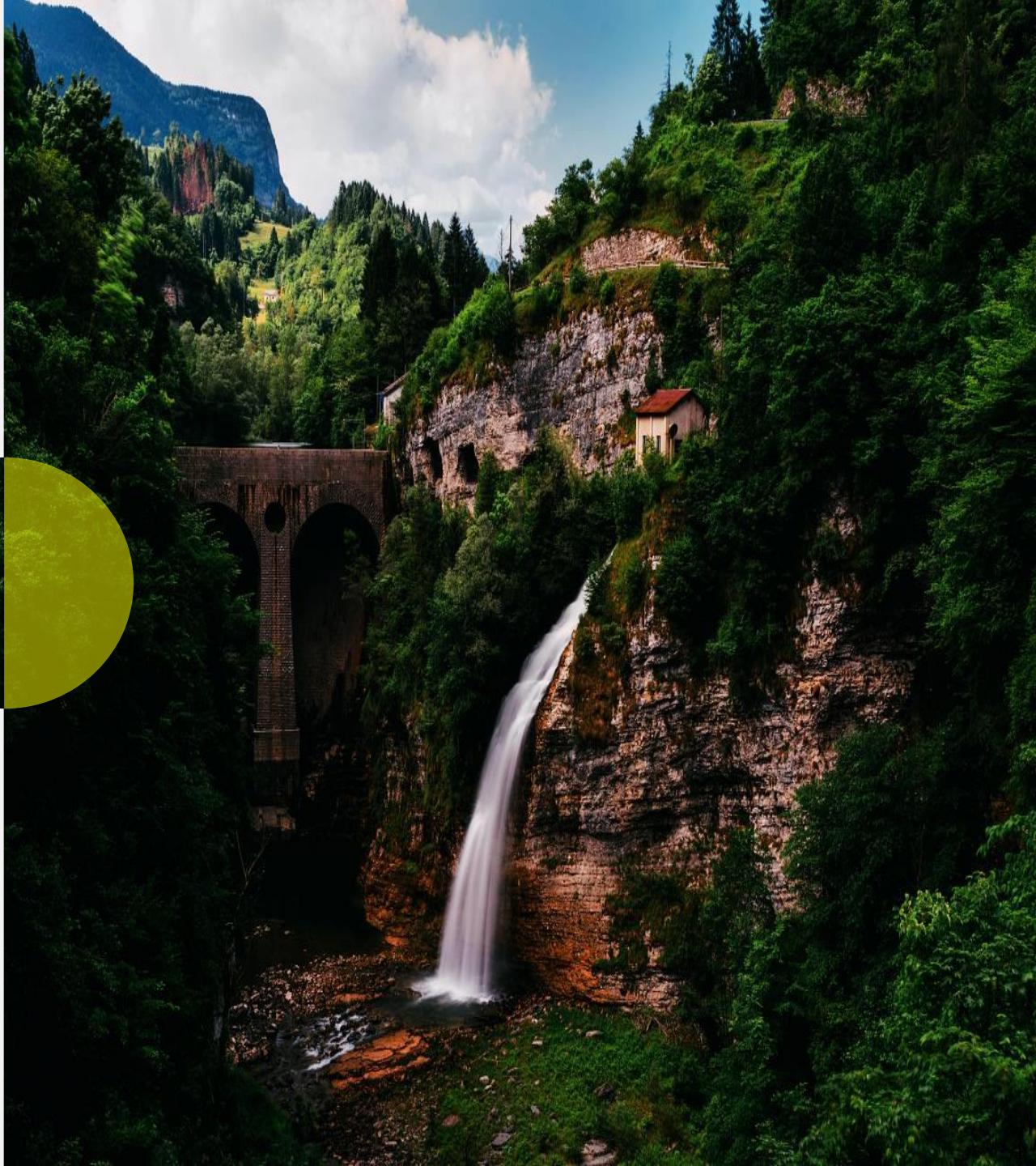


01

Introduction

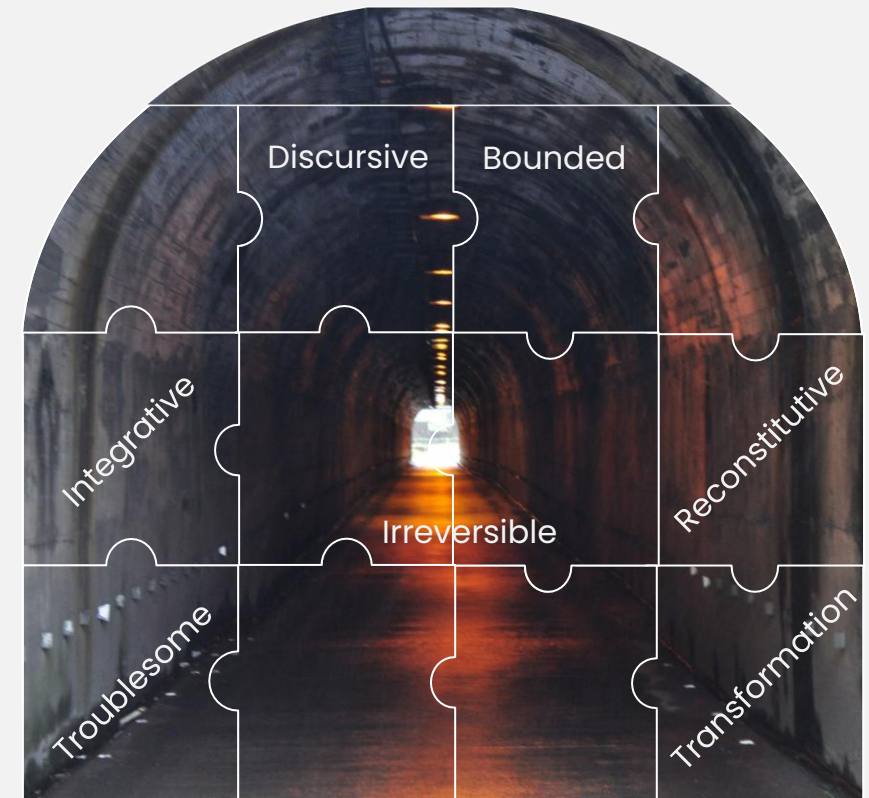
A threshold concept can be considered ***akin to a portal***, opening up a ***new and previously inaccessible way of thinking***.

It represents a ***transformed way of understanding, or interpreting***, or viewing something without which the learner cannot progress.



Introduction

Troublesome	TRB	Alien', or counter-intuitive
Integrative	INT	Sense of 'clicking together'
Transformative	TRN	Shift in the perception of a subject
Irreversible	IRV	Unlikely to be forgotten
Bounded	BND	Discipline distinctive
Reconstitutive	REC	Reconfiguration of prior schema/ Discarding potential misconceptions
Discursive	DIS	Extended use of natural, symbolic or artificial language



Portal showing different attributes of Threshold Concept

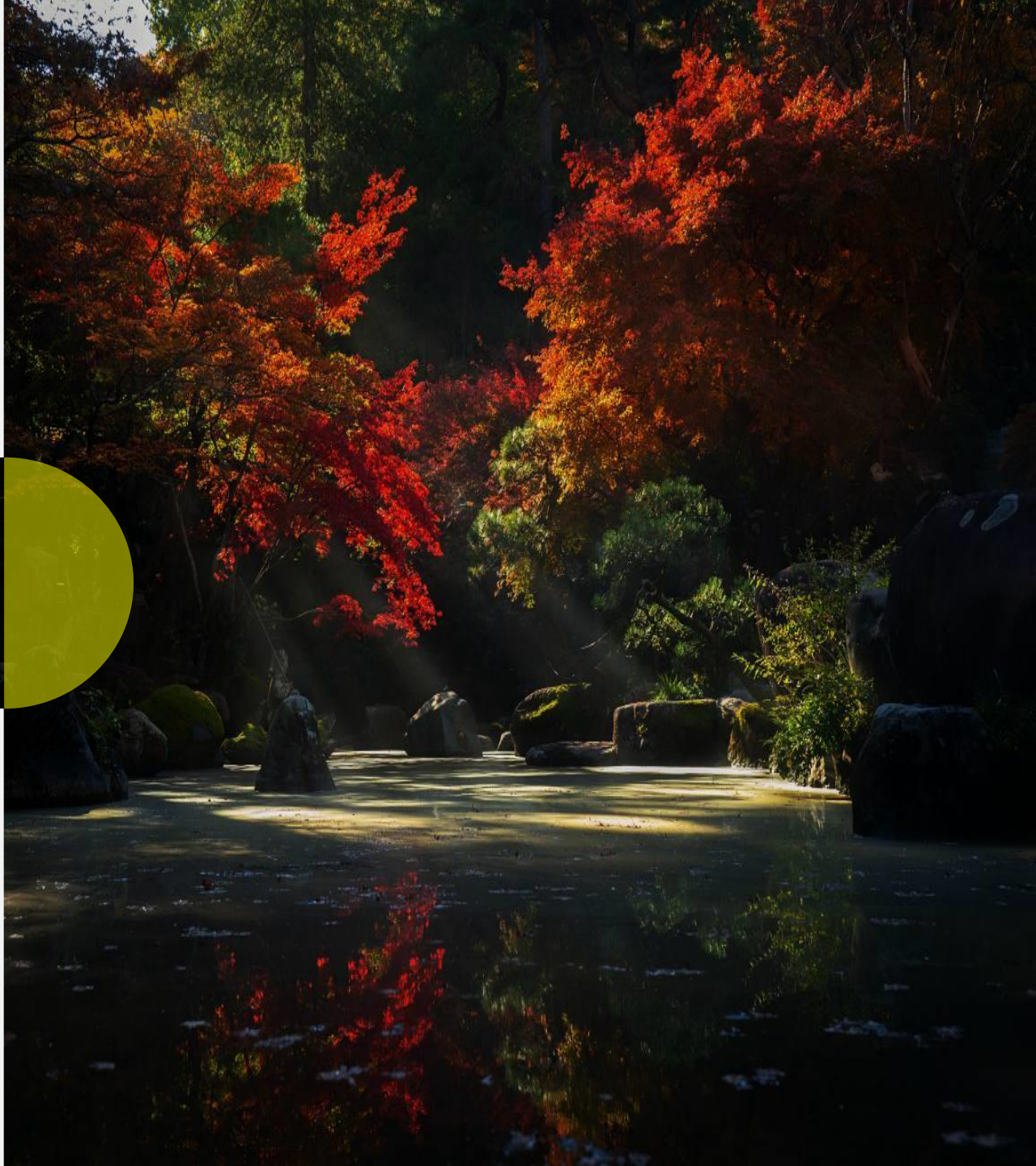
Meyer, J. H., & Land, R. (2005). Threshold concepts and troublesome knowledge (2): Epistemological considerations and a conceptual framework for teaching and learning. *Higher education*, 49(3), 373-388.

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02

Pharmacology as a troublesome discipline

- Widely considered, a difficult discipline to learn
- Challenges associated with the difficult nature of the content coupled with the ineffective delivery methods used such as didactic lectures with missing clinical context
- Difficult for students to grasp its technical and medical terms and how pharmacological principles translate from theory into practice



Pharmacology as a troublesome discipline



Content

- Difficult knowledge/concepts/nomenclature
- Ever Expanding Knowledge Base
- Problems with Course Design/ Curricular Challenges

Teaching & Learning

- Difficulty internalization of pharmacological principles
- Cognitive Load/variability of instructional design
- Didactic Lectures & Missing Clinical Context

Challenging Practices

- Drug Prescribing
- Drug Delivery
- Adverse drug reporting

White, P. J., Davis, E. A., Santiago, M., Angelo, T., Shield, A., Babey, A. M., ... & Hinton, T. (2021). Identifying the core concepts of pharmacology education. *Pharmacology research & perspectives*, 9(4), e00836

Engels, F. (2018). Pharmacology education: Reflections and challenges. *European Journal of Pharmacology*, 833, 392-395.

03

Methodology


Consensus-obtaining method devoted to problem-solving, notion development or establishing priorities.

The problem is presented to the group as a nominal question, that generates discussion around ideas by individual participants, eventually, the voting/ranking phase helps the participants to prioritize and agreed upon those ideas.



Methodology



 5-20 mins

SILENT GENERATION

- Non-interactive phase,
- Participants privately reflect & record the ideas/concepts



 30 mins

ROUND ROBIN

- Begins with participants sharing a single idea at a time in a round robin fashion,
- This phase continues until there is no new idea coming forward



 30 mins

CLARIFICATION/GROUPING

- Grouping similar ideas together in agreement with all the participants.
- Generate an agreed list of ideas/concepts



 10 mins

VOTING/RANKING

- Voting for selection of the most integral ideas.
- Literature commonly supports the ranking of the top five ideas

Schematic diagram of the classical steps of NGT

04

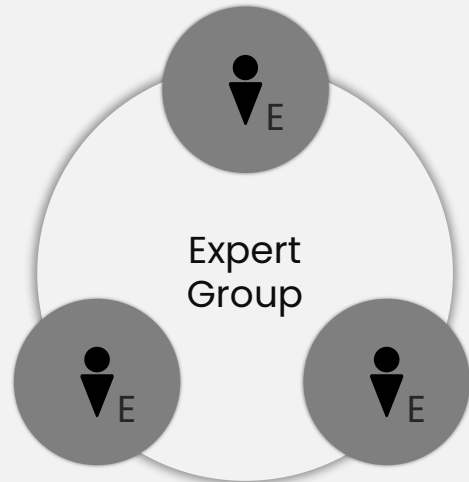
Configurations of the groups used for the sessions

Participants included

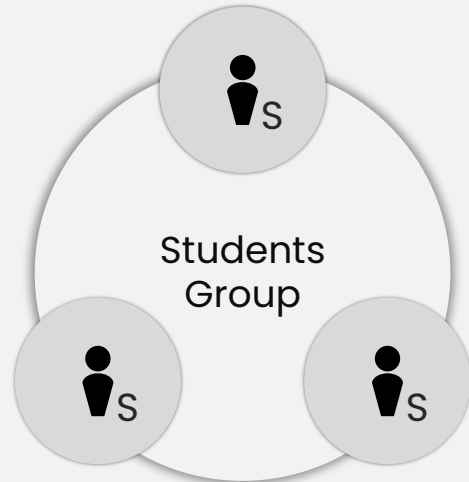
Experts ► Subject Expert, Medical Doctor, Medical Educator & Medical Students ► Y1, Y2, Y3, Y4, Y5 engaged in different groups with variable configurations



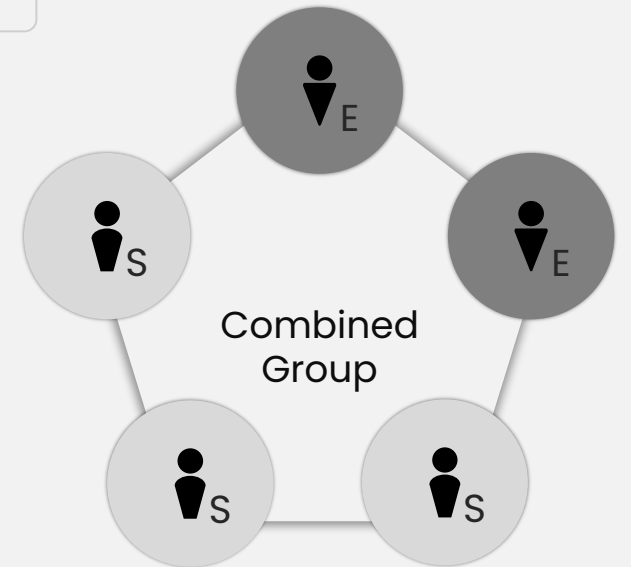
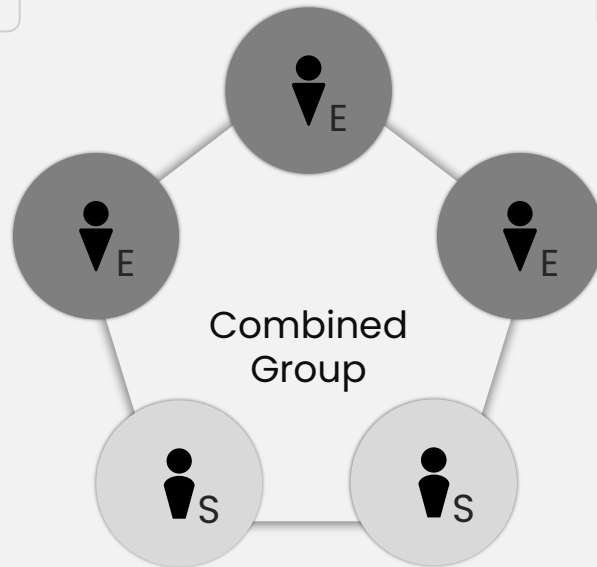
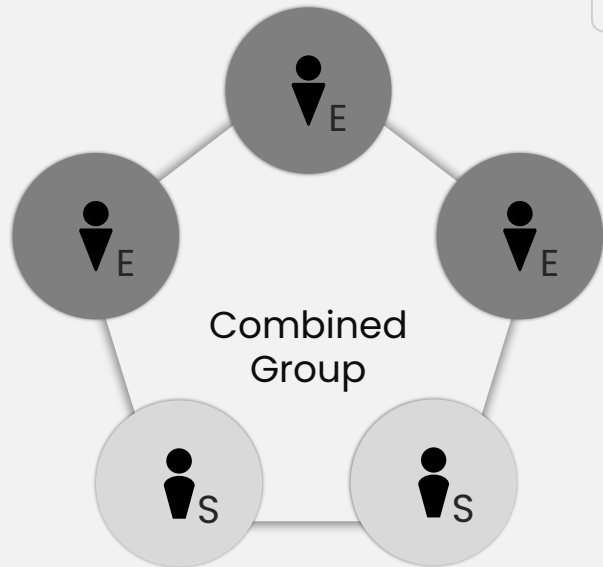
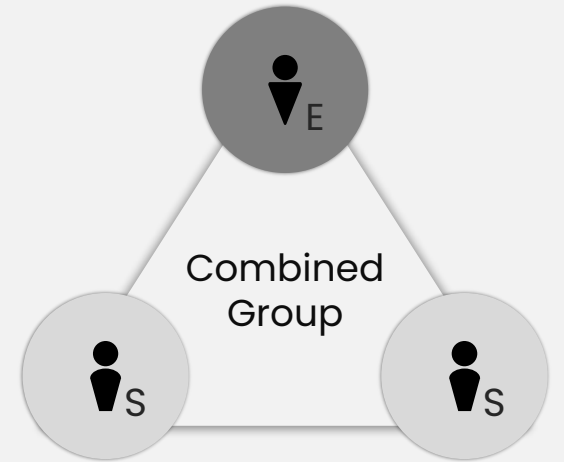
Configurations of the groups used for the sessions



E = Expert



S = Student



05

Results

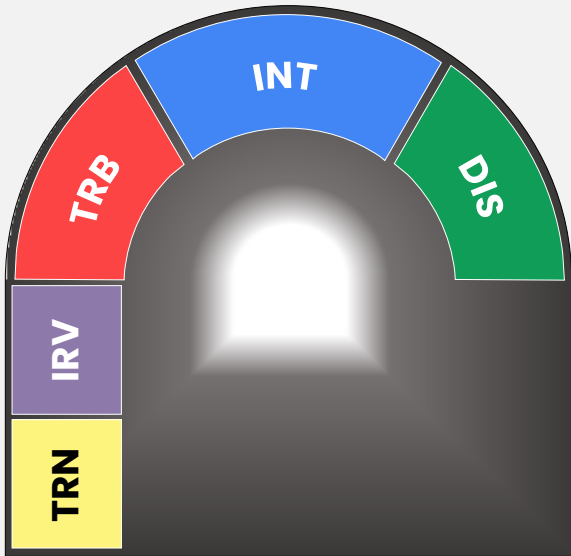
The top four concepts identified through multiple sessions included:

1. Drug mechanism of action & physiology,
2. Dose adjustment,
3. Pharmacokinetics principles &
4. Molecular basis of individual drug (target or receptor) interaction

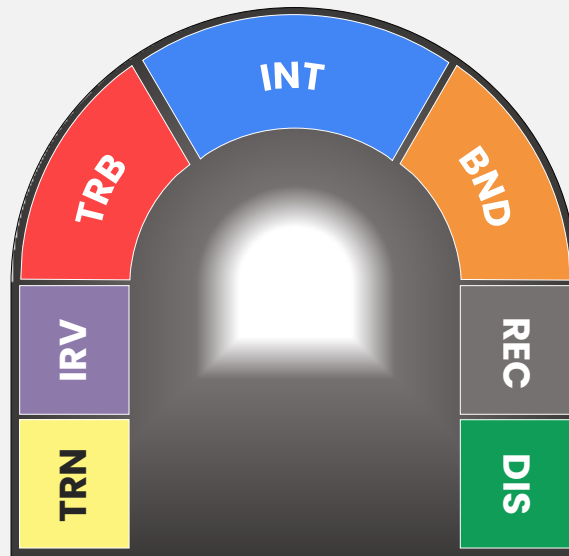
All these concepts were aligned with many of the key attributes of threshold concepts.



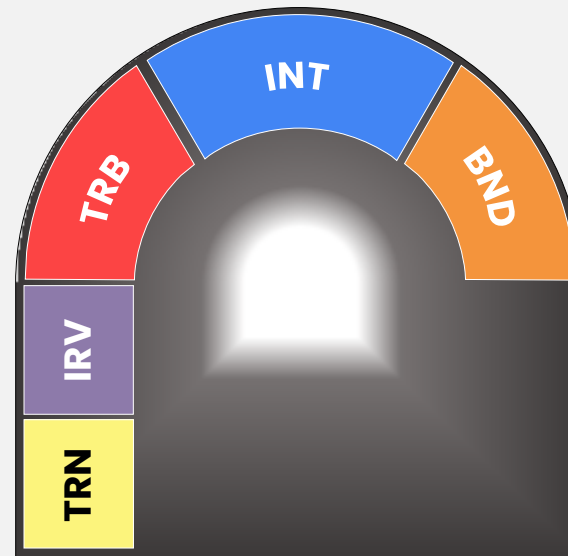
Results



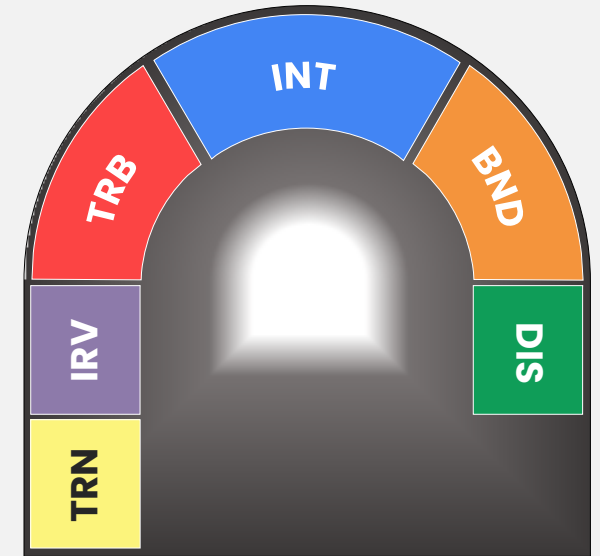
1-Drug mechanism of action & physiology



2-Dose adjustment



3-Pharmacokinetics principles



4-Molecular basis of individual drug (target or receptor) interaction

Take Away Message

The consensus generated through NGT helped to identify the potential troublesome knowledge and threshold concepts of pharmacology.

Engaging experts with students was worthwhile as it introduced an element of diversity to the process of data collection.



References

Meyer, J., & Land, R. (2003). *Threshold concepts and troublesome knowledge: Linkages to ways of thinking and practising within the disciplines* (pp. 412-424). Edinburgh: University of Edinburgh.

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University

Introduction:

A threshold concept can be considered as **akin to a portal**, opening up a **new & previously inaccessible way of thinking**.

It represents a **transformed way of understanding, or interpreting**, or viewing something without which the learner cannot progress.

Pharmacology is widely considered to be a difficult discipline to learn. There are challenges associated with the difficult nature of the content coupled with ineffective delivery method used such as didactic lectures with missing clinical context.

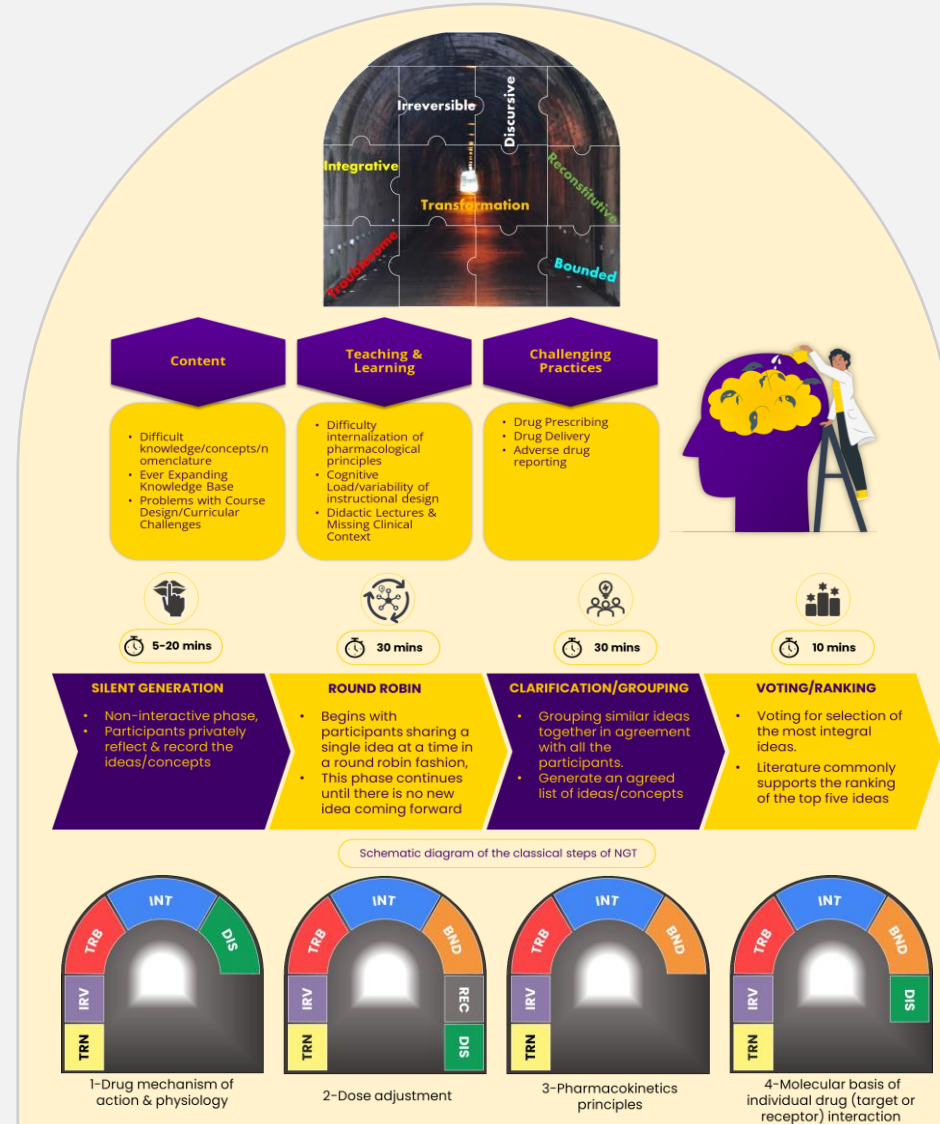
It is especially difficult for students to grasp its technical and medical terms and how pharmacological principles translate from theory into practice.

Aim & Objectives

The aim of this study is to identify and prioritise the threshold concepts of pharmacology.

Methodology

Consensus-obtaining method devoted to problem-solving, notion development or establishing priorities.



Methodology

The problem is presented to the group as a nominal question, that generates discussion around ideas by individual participants, eventually, the voting/ranking phase helps the participants to prioritise and agreed upon those ideas.

Take Home Message

The consensus generated through NGT helped to identify the potential troublesome knowledge and threshold concepts of pharmacology. Engaging experts with students was worthwhile as it introduced an element of diversity to the process of data collection

Literature Cited

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