Is it graded? Using online discussion forums to develop criticality in thought

Applied Learning Conference 2022: Embracing Change in an Era of Disruption

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Making critical thinking visible

Do you see critical thinking applied in your course? Why? Why not?

If you do adopt a model, how would you apply it to your course?

What do you think critical thinking looks like when applied to your classes or courses?

Making critical thinking visible

A pedagogical framework: principles of critical thinking "curated" into a framework to guide the teaching and learning of a course

Instructional activities: integrating specific tools/components of critical thinking into our instruction (lessons, discussions, tasks)

Assessment: integrating specific tools/components of critical thinking into your assessment (assignments and rubrics)

Key considerations: Consistent, Explicit, Visible

(Patel, forthcoming)

What the study is about

Use of an online discussion forum (ODF) in higher education

Lack of active participation, critical thinking, and substantive engagement with others (Baran & Correia, 2009)

Need for a deliberate instructional strategy

To develop higher levels of criticality in thought in engineering students' forum responses, with an application of critical thinking tools, to collaboratively construct knowledge and deepen their conceptual understanding of Engineering leadership.

Why use online discussion forums?

Eliminate communication barriers involving introverted students who would not participate actively in face-to-face or synchronous lessons (Onyema et al., 2019)

An effective tool for engaging students outside formal lessons - post responses, interact and receive feedback, and foster deeper understanding (Balaji & Diganta, 2010)

Additional benefit of time and space to consider their position before responding to others (Boud et al., 2001)

Leveraging on the affordances of ODFs

Interactions between participants can mimic that of a face-to-face discussion – with back-and-forth dialogue among participants, making it a dialogic experience (Patel, 2021)

Continue to discuss a topic for as long as there is interest (Parks-Stamm et al., 2017)

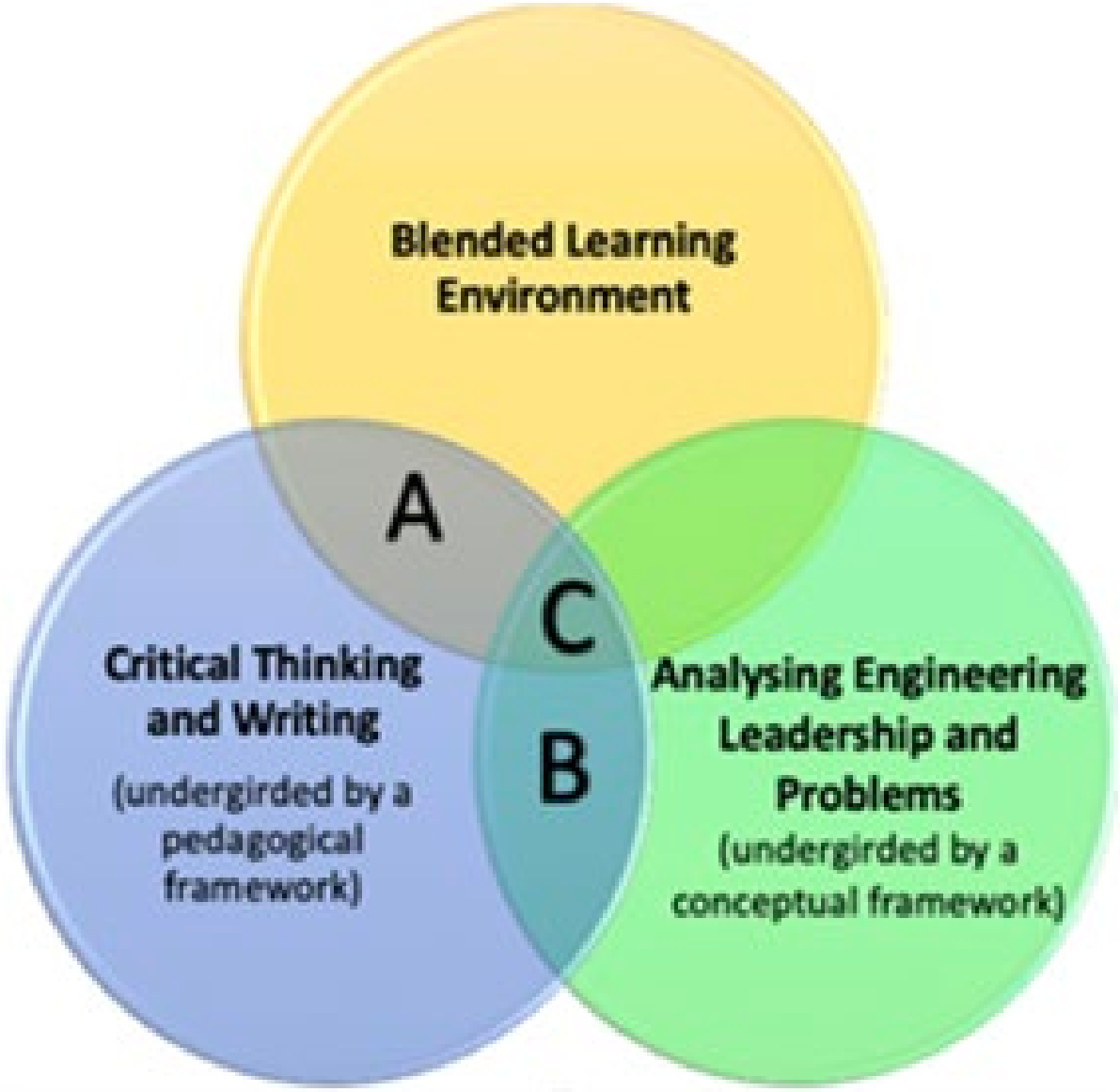
Learning occurs through an egalitarian process in which participants generate, challenge, reflect upon, and defend ideas, thereby constructing meaning through these exchanges (Paul & Elder, 2014).

An ideal tool for supporting collaborative knowledge construction as when students interact to share knowledge and solve problems, they would need high-level thinking (De Wever et al., 2010)

Challenges of using ODFs

- Graded ODFs tend to be the strongest motivator for student participation (Seo, 2007)
- Students need to be highly motivated (Mettiäinen, & Vähämaa, 2013)
- Students may not see the value in the use of ODFs (Patel, 2020)
- Weaker (in language) students may not know how to engage in a discussion or engage others after sharing their own responses (Hancock, 2012).
- Online activities must be designed with relevant pedagogical knowledge to enhance students' learning experiences (Patel, 2021a; Patel, 2021b)
- Tutor timely feedback needed so students gain formative assessment on their learning and consequently even have their anxieties reduced (Comer & Lenaghan, 2012)

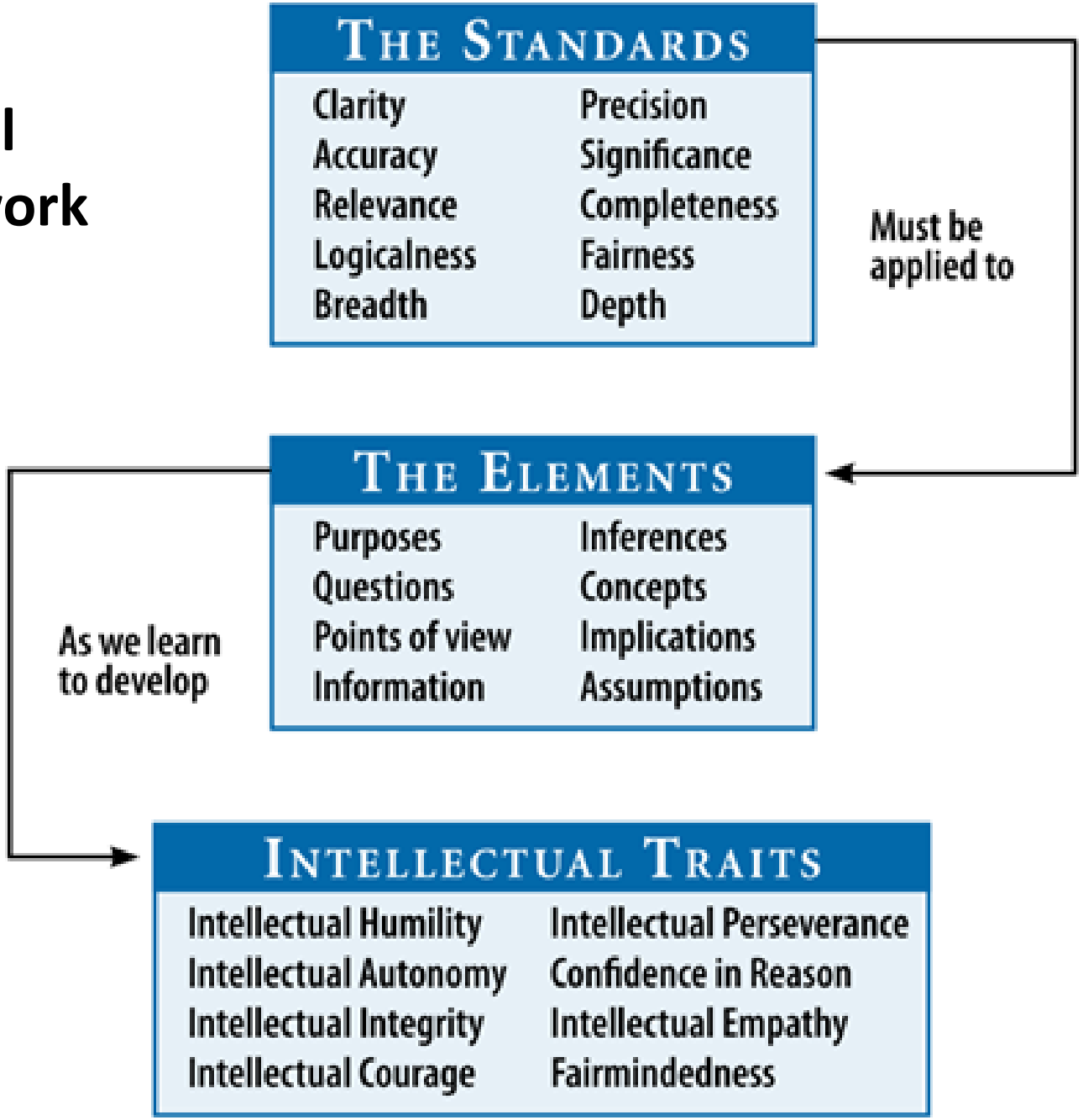
Module Conceptual Framework



Developing criticality in thought

- Disconnect between the amount of **critical thinking experience faculty believed** they were providing to students and the **amount of critical thinking experience students perceived** they were receiving (Cooney et al., 2008).
- **Discussion and dialogue** are considered central to the teaching of critical thinking (Şeker & Kömür, 2008).
- An **explicit integration** of a critical thinking framework, students would have an **opportunity to develop higher levels of criticality in thought** as they co-construct knowledge and deepen their understanding (Vandenburg, 2006).

Paul-Elder Critical Thinking Framework (2019)



Paul & Elder (2019). The Miniature Guide to Critical Thinking Concepts and Tools, Foundation for Critical Thinking Press

Methodology

54 Year-2 engineering students

Modeling to scaffold

Use of EoT and IS

Annotating responses

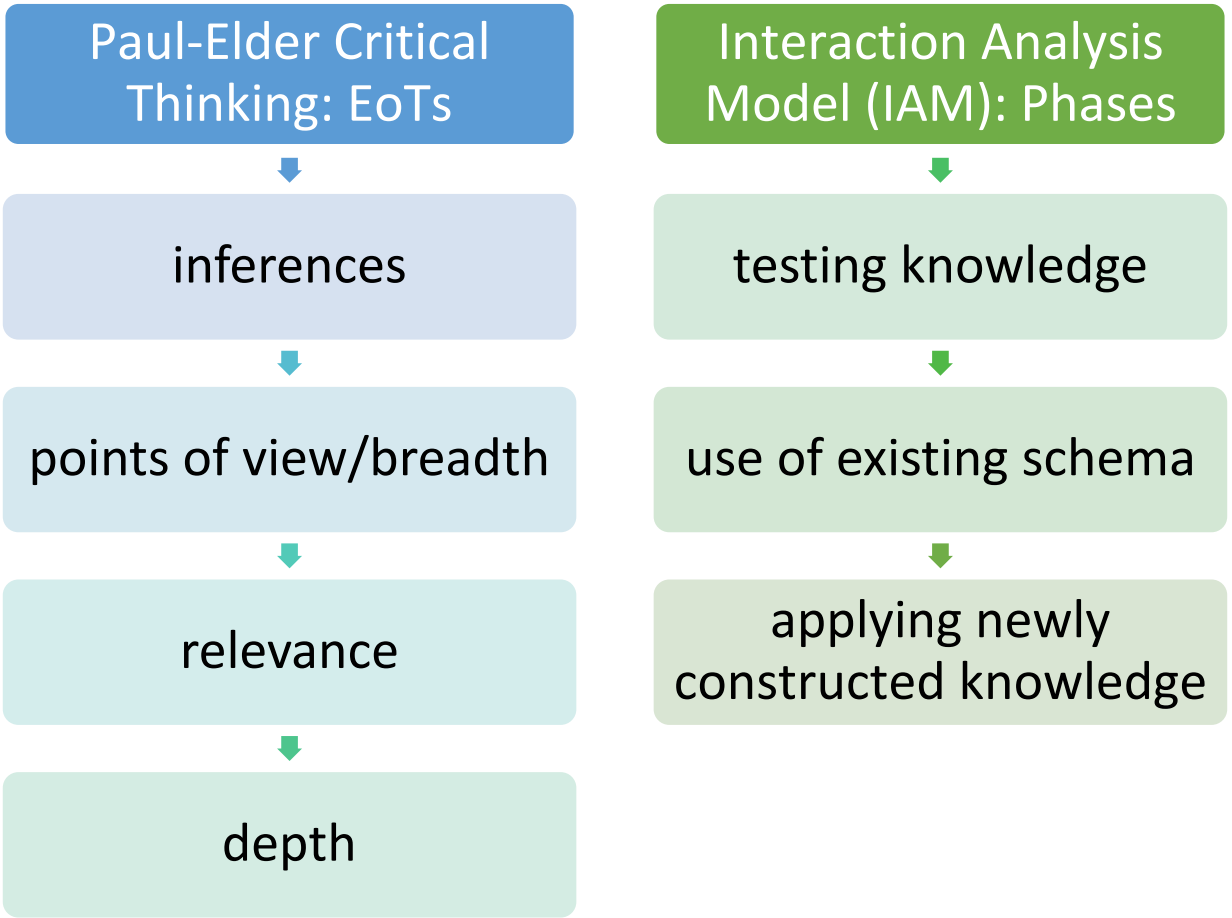
Explicit & visible application

Assessing learning in online discussion forums

The Interaction Analysis Model (IAM) five phases indicating the degree of knowledge-construction activities across a distribution (Gunawardena et al., 1997; Lucas, Gunawardena & Moreira, 2014)

Phase 1 - Sharing and comparing of information	Statement of observation or opinion; statement of agreement between participants.
Phase 2 - Discovery and exploration of dissonance or inconsistency among participants	Identifying areas of disagreement; asking and answering questions to clarify disagreement.
Phase 3 - Negotiation of meaning or knowledge co-construction	Negotiating meaning of terms and negotiation of the relative weight to be used for various arguments.
Phase 4 - Testing and modification	Testing the proposed new knowledge against existing cognitive schema, personal experience, or other sources.
Phase 5 - Phrasing of agreement and applications of newly constructed meaning	Summarizing agreement and metacognitive statements that show new knowledge construction.

From the coding, it is found that the highest coverage of references for the first and second level nodes are:



Data Analysis

Sample 1 (Student A)
Date: 05-Sep 11:31 PM

"…. He highlighted that most engineers who assumed management role are proficient in solving technical problems but not unexpected and irrelevant emergency such as a siren going off **(Details from the CASE)**. Usually, they will get flustered by unexpected events and lacked the ability to apply problem solving skills to problems outside of their technical expertise **(IAM Phase IV: Linking to Existing Schema)** and thus, the first thing that came to their minds were to inform their superiors (EOT: Assumption/Perspective). However, that was not the case for him, he was able to... This is in line with the Rottman model's technical mastery that an engineer like Mr Loke not only able to solve engineering problems but also problems outside of his expertise (CLAIM). Collaborative optimization was demonstrated by Mr Loke's as he understands the importance of working as a team to deliver the results way back in his schooling days when he joined team sports and also while he was working in the company **(CLAIM – IAM Phase IV: Testing Proposed New Knowledge)**. Organizational innovation was also visible during his stay in TMT. He came up with a 2x2 matrix for telco that aimed to achieve both high broadband and high mobility quadrant, which is what we commonly as 4G network nowadays. He came up with this in the 1997 when no other engineers could. The thing that inspired him in this innovation was the fact he knows that engineering works is not how good the thing is but what the customers want **(EOT: Interpretation/Inference)**…."

***underlined text: descriptive "recall" details of the Engineering actions presented in the case study**

***bolded text: application of the Paul-Elder framework and phases of the IAM**

Data Analysis

Sample 2 (Student B)
Date: 05-Sep 11:55 PM

Hi Student A (Responding to another), while you put this under technical expertise, I would put it all under innovation as I felt that it was a calculated risk that Mr Loke took **(IAM Phase II: Exploration of Dissonance – Identifying Areas of Disagreement).** I guess technical expertise works too as it is a creative and detailed analysis of the technical problem. Mr Loke was heavily inspired by his professor's take on problem solving, to start with the end in mind. By starting with the end in mind, it helps make the plan clearer as we can more easily see the path by backtracking.

An apt example would be solving mazes. **(IAM Phase IV: Testing Proposed New Knowledge)** Any maze would be much easier to solve when starting from the end as opposed to starting from the initial point. From the initial point, it is more likely to run into dead ends and render much of your route entirely useless. By backtracking from the end, you 'start' from the correct path and a good start is half the battle won. Creative analysis of problems is an important skill to have **(EOT: Interpretation)**

Also I too would like to think that Rottmann's model is heavily intertwined. Technical expertise and Innovation goes hand in hand **(IAM Phase IV: Testing Proposed New Knowledge)**. They complement each other and a good Engineer Leader should ideally have both. Imagine this - had Mr Loke thought about the problem creatively but lacked the ability to take the calculated risk, do you think he would have made the correct leadership decision that night? Or if he decided to take the risk to start from the system level test without analysing the problem first, do you think he would succeed in solving the problem? **(CLAIM; IAM Phase III: Negotiation of co-constructed knowledge) (Intellectual Standards: Breadth – Looking at it in other ways. EOT: Orientation, Implications and consequences)**

***underlined text: descriptive "recall" details of the Engineering action presented in the case study**

***bolded text: application of the Paul-Elder framework and phases of the IAM**

Students' Critical Reflection Essays

Student A wrote:

The **weekly forums** had provided me with a platform to **improve the (critical thinking and writing) skills as I have to critically analyse** the article/question posted and I have to provide my feedback on another person's (post). Through this exchange, I am **exposed to numerous insights and perspectives** from my module mates… and for me to **exercise my critical thinking and writing skills** in this module. Looking back at my first forum post, I believe I have improved my critical thinking and writing skill. This skill that I have acquired has **increased my competency in presenting my arguments effectively**.

Student B wrote:

The most important takeaway I had would be **the art of thinking and analysing problems in a 'critical' way, which is objective and systematic**. The **online forum activities** which involved engineering case studies, such as the one on technological inventions for real world problems, allowed me to **gather information and evaluate them effectively to provide my opinion backed up with substantial evidence**. I am able to **make a reasoned judgement and draw conclusions** from the given information, hence demonstrating critical thinking.

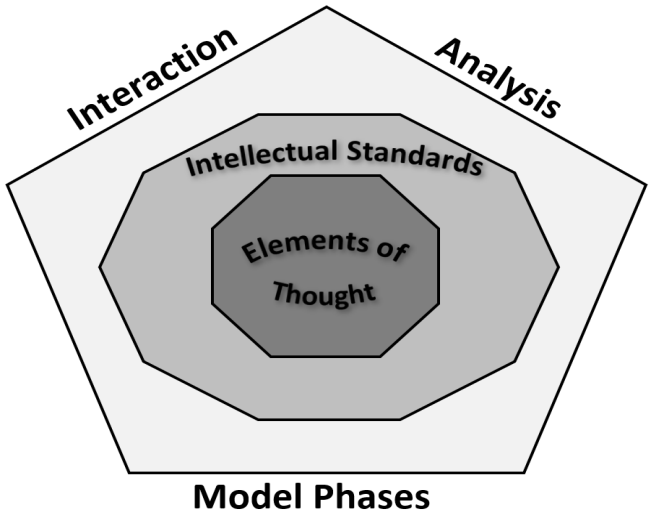
Discussion

Ambiguous general guidelines would result only in unproductive and ineffective discussions.

Simply making discussion forums graded or part of the participation mark for the module is not going to help students develop critical thinking skills.

Tutors do not look forward to the highly subjective and at times "random" assessment of using quantity (number of posts or length of posts) to assess students.

Discussion



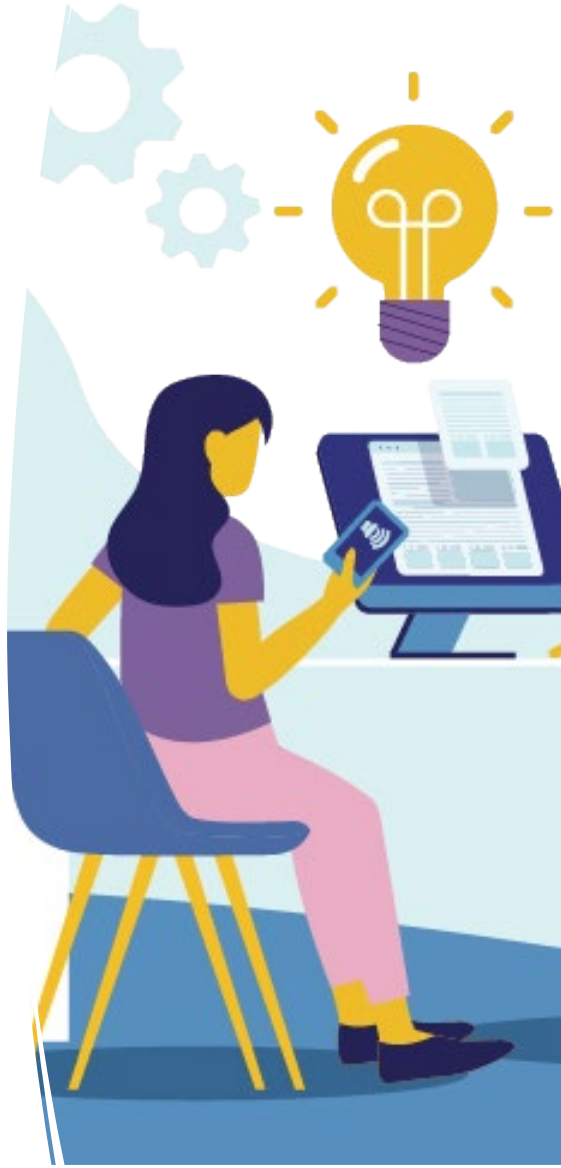
Step 1: Identify Elements of Thought (EOTs)	Step 2: Apply Intellectual Standards onto the EOTs	Step 3: Aim to Achieve one of the IAM Phases
Purpose Questions Points of View Information Inferences Concepts Implications Assumptions	Clarity Accuracy Relevance Logicalness Breadth Precision Significance Completeness Fairness Depth	Phase 1 - Sharing and comparing of information Phase 2 - Discovery and exploration of dissonance or inconsistency among participants Phase 3 - Negotiation of meaning or knowledge co-construction Phase 4 - Testing and modification Phase 5 - Phrasing of agreement and applications of newly constructed meaning

Proposed Conceptual Framework to Guide Students' Use of Critical Thinking in Discussion Forums (adapted from Gunawardena et al., 1997; Lucas et al., 2014 & Paul & Elder, 2009)

Patel, N. S. (2021). Development of criticality in thought: a conceptual framework for online student discussion forums. International Journal of TESOL Studies, 3(3), 22-40. https://doi.org/10.46451/ijts.2021.09.02

Conclusion

- Collaborative ODF tasks designed for interactivity
- Time and space to think and engage each other with deliberate thought
- Active participation, higher engagement and explicit application of critical thinking tools
- A conceptual framework is proposed as a way forward in looking at the assessment of student's critical reflection and making the demonstration of critical thinking skills visible for students and tutors.



Thank you!

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