Passion

Passionate about improving educational outcomes

Wisdom

Using the evidence and wisdom of key thought leaders

Relationships

Building relationships to support educators

Dedication

Commitment and dedication to excellence in professional learning

Higher Order Questions

Higher-order Questions (HOQ)

Higher-order questions are those that the students cannot answer just by simple recollection or by reading the information "*verbatim*" from the text. Higher-order questions put advanced cognitive demand on students. They encourage students to think beyond literal questions.

Higher-order questions promote critical thinking skills because these types of questions expect students to apply, analyse, synthesize, and evaluate information instead of simply recalling facts. For instance, *application questions* require students to transfer knowledge learned in one context to another; *analysis questions* expect students to break the whole into component parts such as analyse mood, setting, characters, express opinions, make inferences, and draw conclusions; *synthesis questions* have students use old ideas to create new ones using information from a variety of sources; and *evaluation questions* require students to make judgments, explain reasons for judgments, compare and contrast information, and develop reasoning using evidence from the text.

Higher-order Questions Research

According to research, teachers who effectively use a variety of higher-order questions can overcome the brain's natural tendency to develop mental routines and patterns to limit information, which is called *neural pruning*. As a result, student's brains may become more open-minded, which strengthens the brain.

According to an article in *Educational Leadership* (March 1997), researchers Thomas Cardellichio and Wendy Field discovered that higher-order questions increase *neural branching*, the opposite of neural pruning. In addition, these researchers found that teachers can promote the process of neural branching through seven types of questions.

1. *Hypothetical thinking.* This form of thinking is used to create new information. It causes a person to develop an answer based on generalizations related to that situation. These questions follow general forms such as *What if this happened*? *What if this were not true*?, etc.

2. *Reversal thinking*. This type of thinking expects students to turn a question around and look for opposite ideas. For example, *what happens if I reverse the addends in a math problem*? *What caused this? How does it change if I go backward*?, etc.

3. *Application of different symbol systems*. This way of thinking is to apply a symbol system to a situation for which it is not usually used, such as writing a math equation to show how animal interaction is related.

4. *Analogy*. This process of thinking is to compare unrelated situations such as how is the Pythagorean Theorem related to cooking. These questions typically ask *How is this like ___?*

5. *Analysis of point of view*. This way of thinking requires students to consider and question other people's perspective, belief, or opinion in order to extend their minds. For instance, a teacher may ask a student, *what else could account for this*? or *how many other ways could someone look at this*?

6. *Completion*. This form of thinking requires students to finish an incomplete project or situation that would normally be completed. For example, removing the end of a story and expecting the students to create their own ending.

7. *Web analysis*. With web analysis, students must synthesize how events are related in complex ways instead of simply relying on the brain's natural ability to develop a simple pattern. For example, *how extensive were the effects of _____?* Or *track the relationship of events following from ___* are types of web analysis questions.

The researchers concluded that this type of questioning can lead to better critical thinking skills. "*They can analyse, synthesize, evaluate, and interpret the text they are reading at complex levels. They can process text at deep levels, make judgments, and detect shades of meaning. They can make critical interpretations and demonstrate high levels of insight and sophistication in their thinking. They are able to make inferences, draw relevant and insightful conclusions, use their knowledge in new situations, and relate their thinking to other situations and to their own background knowledge. These students fare well on standardized tests and are considered to be advanced. They will indeed be prepared to function as outstanding workers and contributors in a fast-paced workplace where the emphasis is on using information rather than just knowing facts.*"

Higher-order Questions and Explicit Direct Instruction

The Explicit Direct Instruction (EDI) model incorporates a variety of higher-order questions in order to encourage and increase critical thinking skills.

The **LEARNING OBJECTIVE** component in EDI is the only question that is at a low level of Bloom's Taxonomy. The reason for this is because the content during this portion of the lesson is not at a high level. Also, the students have not been taught the high-level content. Typically, the question asked to students is "What are we doing today? or What is our Learning Objective?"

The **CONCEPT DEVELOPMENT** component includes a variety of higher-order concept-related questions because the content is at a high level. Here is a list of higher-order questions that are asked during this EDI component:

- In your own words, what is (insert the concept being taught)?
- Which is an example of _____? Why?
- What is the difference between the example and the non-example?
- Why is this an example of _____?
- Give me an example of _____.
- Draw an example of _____.
- Match the examples to the definition of _____.
- Which picture/poster shows an example of _____?

The **SKILL DEVELOPMENT** component asks higher-level thinking-process questions after modelling the skill.

- How did I know how to (insert skill modelled)?
- How did I know that this was the correct answer?
- How did I use _____to ensure that I knew how to find the _____?
- How did I know how to interpret the answer?

The **GUIDED PRACTICE** asks higher-level process questions that require the students to show their thought process when performing the skill.

- How did you know how to _____?
- How did you know that this was the correct answer?
- How did you use to ensure that you knew how to find the _____?
- How did you know how to interpret the answer?
- Which steps was most difficult for you? Why?

The **RELEVANCE** component includes higher-level evaluation questions.

- Does anyone have any other reason as to why this is important?
- Which reason is the most relevant to you? Why?

The **CLOSURE** component includes high-level questions such as:

- What did you learn today?
- How did the lesson meet the Learning Objective?
- How will this lesson benefit you in the future?

If higher-order questions promote critical thinking skills, as research shows, then higher-order questions should be included throughout instruction. The EDI model offers a good way to do just that!

Citations
Educational Leadership, Seven Strategies That Encourage Neural Branching, March 1997

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Bloom's Question Starters for Higher Order Thinking

Source: Pohl, Learning to Think, Thinking to Learn

Bloom's Question Starter List – This list moves through 6 levels of questions. The first three levels are considered lower order questions; the final three levels are considered higher order. Higher order questions are what we use for Critical Thinking and Creative Problem Solving. I have written what each level of questions are about, given lists of key words that can be used to begin a question for that level, and I have listed Question Starters. You can use this chart to create questions that are specific to your novel.

Level 1: Remember – Recalling Information
- List of key words: Recognize, List, Describe, Retrieve, Name, Find, Match, Recall, Select, Label, Define, Tell

- List of Question Starters:
    - What is...?
    - Who was it that...?
    - Can you name...?
    - Describe what happened after...
    - What happened after...?

Level 2: Understand – Demonstrate an understanding of facts, concepts and ideas
- List of key words: Compare, Contrast, Demonstrate, Describe, Interpret, Explain, Extend, Illustrate, Infer, Outline, Relate, Rephrase, Translate, Summarize, Show, Classify

- List of Question Starters:
    - Can you explain why...?
    - Can you write in your own words?
    - Write a brief outline of...
    - Can you clarify...?
    - Who do you think?
    - What was the main idea?

Level 3: Apply – Solve problems by applying knowledge, facts, techniques and rules in a unique way
- List of key words: Apply, Build, Choose, Construct, Demonstrate, Develop, Draw, Experiment with, Illustrate, Interview, Make use of, Model, Organize, Plan, Select, Solve, Utilize

- List of Question Starters:
    - Do you know of another instance where...?
    - Demonstrate how certain characters are similar or different?
    - Illustrate how the belief systems and values of the characters are presented in the story.
    - What questions would you ask of...?
    - Can you illustrate...?
    - What choice does ... (character) face?

Level 4: Analyse – Breaking information into parts to explore connections and relationships
- List of key words: Analyse, Categorize, Classify, Compare, Contrast, Discover, Divide, Examine, Group, Inspect, Sequence, Simplify, Make Distinctions, Relationships, Function, Assume, Conclusions

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- List of Question Starters:
    - Which events could not have happened?
    - If ... happened, what might the ending have been?
    - How is... similar to...?
    - Can you distinguish between...?
    - What was the turning point?
    - What was the problem with...?
    - Why did... changes occur?
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Level 5: Evaluate – Justifying or defending a position or course of action

- List of key words: Award, Choose, Defend, Determine, Evaluate, Judge, Justify, Measure, Compare, Mark, Rate, Recommend, Select, Agree, Appraise, Prioritize, Support, Prove, Disprove. Assess, Influence, Value

- List of Question Starters:
    - Judge the value of...
    - Can you defend the character's position about...?
    - Do you think... is a good or bad thing?
    - Do you believe...?
    - What are the consequences...?
    - Why did the character choose...?
    - How can you determine the character's motivation when...?

Level 6: Create – Generating new ideas, products or ways of viewing things

- List of key words: Design, Construct, Produce, Invent, Combine, Compile, Develop, Formulate, Imagine, Modify, Change, Improve, Elaborate, Plan, Propose, Solve

- List of Question Starters:
    - What would happen if...?
    - Can you see a possible solution to...?
    - Do you agree with the actions?...with the outcomes?
    - What is your opinion of...?
    - What do you imagine would have been the outcome if... had made a different choice?
    - Invent a new ending.
    - What would you cite to defend the actions of...?

Higher-order Thinking Question Stems

REMEMBER (Level 1)
Recognizing and recalling
Describe what happens when_____.
How is (are) _____?
How would you define_____?
How would you identify_____?
How would you outline_____?
How would you recognize_____?
List the _____ in order.
What do you remember about_____?
What is (are) _____?
What would you choose_____?
When did _____?
Where is (are) _____?
Which one_____?
Who was (were) _____?
Why did _____?

UNDERSTAND (Level 2)
Interpreting, exemplifying, classifying, summarizing, inferring, comparing, explaining
Elaborate on_____.
How can you describe_____?
How would you clarify the meaning _____?
How would you compare/contrast_____?
How would you differentiate between_____ and _____?
How would you express_____?
How would you generalize_____?
How would you identify_____?
What can you infer from_____?
What can you say about_____?
What did you observe_____?
What is the main idea of _____?
What would happen if _____?
Will you restate_____?

APPLY (Level 3)
Executing and implementing
How would you develop_____?
How would you after _____ to _____?
How would you change_____?
How would you modify_____?
How would you demonstrate_____?
How would you develop_____ to present _____?
How would you present _____?
How would you solve_____?
What actions would you take to perform_____?
What examples can you find that _____?

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What other way would you choose to _____?
What would the result be if _____?
Why does _____ work?

ANALYZE (Level 4)
Differentiating, organizing, attributing
Discuss the pros and cons of _____.
How can you classify _____ according to _____?
How can you compare the different parts of _____?
How can you sort the parts of _____?
How is _____ connected to _____?
How would you explain _____?
What are the advantages and disadvantages of _____?
What can you infer _____?
What can you point out about _____?
What evidence in the text can you find that _____?
What explanation do you have for _____?
What ideas support/validate_____?
What is the problem with _____?
What is your analysis of _____?
Why do you think _____?

EVALUATE (Level 5)
Checking and critiquing
Create a poem/riddle/song that explains_____?
Devise a way to_____?
How would you compile the facts for_____?
How would you elaborate on the reason_____?
How would you generate a plan to_____?
How would you improve_____?
How would you portray_____?
Predict the outcome if _____?
What alternative would you suggest for_____?
What changes would you make to revise_____?
What could you invent_____?
What facts can you gather_____?
What would happen if _____?

CREATE (Level 6)
Generating, planning, producing
Determine the value of _____.
How could you verify_____?
How would you determine which facts_____?
How would you grade_____?
Rank the importance of _____.
Rate the _____. Explain your rating.
What choice would you have made_____? Explain your reasoning.
What criteria would you use to assess_____?
What data was used to evaluate_____?
What information would you use to prioritize_____?

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What is the most important_____? Tell why.
What is your favourite_____? Why?
What would you suggest_____?
What is your opinion of _____? Support your response