



## Fostering Critical Thinking Skills in Tertiary-Level Students for Media and Information Literacy

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**Abstract:** *To discern the authenticity of online content, one must possess Media and Information Literacy (MIL). MIL encompasses the knowledge, mindset, and skill set needed to determine what information is necessary, how to access it, when to do so, where to find it, critically evaluate it upon acquisition, and employ it ethically. In the context of fake news, individuals must engage in critical thinking when engaging with the media and content they encounter to prevent misinformation. Some materials may contain misleading content that could be mistaken for humour, misuse, or explicit language or expressions. Hence, the primary objective of this study is to examine how undergraduate students at tertiary-level educational institution employ Critical Thinking to interpret media and information, ultimately enhancing their MIL. This research employs a quantitative research approach, incorporating an online questionnaire and specific media content sourced from social networking platforms. The questionnaire is structured based on the Delphi report, which outlines six fundamental critical thinking skills. 340 participants are asked to indicate whether they have put into practice these skills while examining the provided media materials. The anticipated outcomes indicate a moderate level of critical thinking capability among students in comprehending and critically evaluating media information. This underscores the pressing need to enhance their critical thinking skills to a higher level, enabling them to effectively process a variety of media information. Additionally, the findings illuminate which of the six critical thinking skills delineated in the Delphi report were more commonly employed and how the application of core critical thinking skills in the interpretation of media information varies by gender, year of study, and programme. Critical thinking assumes a pivotal role in MIL as it plays a determining role in assessing the reliability of information sources, swiftly recognising fake news, and effectively sifting through information to uncover the truth.*

**Keywords:** media literacy, information literacy, critical analysis, cognitive skills, educational interventions

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### 1. Introduction

In Malaysia, education focuses heavily on nurturing critical thinking abilities, particularly at the tertiary level. Students are urged to question, analyse, and judge information. The shift from memorisation to tasks demanding critical thinking is evident in exams and assignments, which frequently include problem-solving and evaluating information.



Critical thinking encompasses the capacity to assess information, discriminate the trustworthiness of sources, and scrutinise the quality of data. It involves a purposeful and self-regulatory act of thinking, which results in interpretation, analysis, evaluation, inference, and found explanation (Dökmecioğlu et al., 2022; Ennis, 2015; Halpern, 2013; Hyytinen et al., 2021). Experts in Facione's (1990) Delphi study (American Philosophical Association, 1990) defined critical thinking as "the process of purposeful, self-regulatory judgment, which results in interpretation, analysis, evaluation and inference ..." (p. 23). The Delphi panel of experts consensually agreed on the following six (6) critical thinking cognitive skills: (1) Interpretation, (2) Analysis, (3) Evaluation, (4) Inference, (5) Explanation, and (6) Self-Regulation. Reliance on social media as a primary source of information among youths may lead to a rampant spread of misinformation in the long term (Chin, 2022). Moreover, research on the intersection of fake news and adolescents' involvement indicates that social media platforms, including TikTok, may serve as fertile ground for the spread of misinformation. This complicates the task for teenagers in discerning between reality and falsehoods (Selnes, 2023; Tamez-Robledo, 2022). In the domain of Media and Information Literacy (MIL), individuals are responsible for critically assessing the trustworthiness and credibility of media sources, whether they appear in traditional print and broadcast media or on digital platforms. These thinking skills help people spot bias, misinformation, and manipulation in media. Media literacy also teaches people to question why media creators make content and to recognise biases in news, ads, and entertainment.

Furthermore, critical thinking promotes the in-depth analysis or deconstruction of media messages, spanning textual, visual, and auditory elements. Such analytical exercises equip individuals with the ability to discern the underlying messages, ideologies, and subtextual layers woven into media materials. Syam and Nurrahmi (2020) stated that when it comes to MIL, the capacity to synthesise information from diverse sources is paramount. Some say understanding media messages truly comes through media literacy. This includes knowing how media is made, shared, and understood in society, as well as using critical thinking skills to question content, where it comes from, and any biases or motives behind it.

Critical thinking proves invaluable in sifting through a multitude of information to establish a comprehensive and well-founded grasp of intricate subjects. Above all, critical thinking serves as a shield against the proliferation of fake news (Bezalel, 2023; Rafeeq, 2023). Media literacy plays a key role in spotting and fighting fake news and misinformation. It encourages people to check if news stories, images, and videos are real and to find trustworthy sources. This study aims to look at the main and smaller skills students use to think critically when judging online media.

Critical thinking and media literacy are closely connected, as having critical thinking skills is crucial for being media literate. This case study aims to understand how undergraduate students analyse media information. Therefore, the main goal is to see how students use critical thinking to understand media and information better, thus improving their media literacy. In general, this study seeks whether undergraduate students use core critical thinking skills in their interpretation of media information.



There are two (2) research questions:

- RQ1: Which of the six critical thinking skills outlined in the Delphi report were utilised more frequently?
- RQ2: How are the usage of core critical thinking skills in the interpretation of media information different according to gender, year of study, and programme?

## 2. Literature Review

### 2.1 The Delphi Report

In 1988, a gathering convened by the American Philosophical Association (APA) brought together 46 experts specialising in critical thinking instruction, assessment, or theory, spanning the disciplines of Philosophy, Education, and Science in the United States and Canada. Their objective was to establish a consensus on critical thinking. A noteworthy result of this meeting was the Delphi Report, where Facione (1990) delineated critical thinking into two dimensions: critical thinking skills and critical thinking disposition. Furthermore, the Delphi experts unanimously identified six core cognitive skills encompassed by critical thinking and outlined 14 dispositions that an exemplary critical thinker should exhibit (Facione, 1990).

The Delphi Report marked a significant milestone in the field of critical-thinking research. Its findings delineated a set of critical-thinking dispositions that encompass qualities like curiosity, methodical thinking, sound judgment, analytical prowess, truth-seeking, open-mindedness, and confidence in reasoning. The central critical-thinking skills identified within the study were (1) interpretation, (2) analysis, (3) evaluation, (4) inference, (5) explanation, and (6) self-regulation. Below is a list of Cognitive Skills and their subskills.

**Table 1: Critical Thinking Cognitive Skills and Sub-skills**

No.	Cognitive skills	Definition	Sub-skills
1.	Interpretation	To comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria.	Categorisation Decoding significance Clarifying meaning
2.	Analysis	To identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express beliefs, judgements, experiences, reasons, information, or opinions.	Examining ideas Identifying arguments Analysing arguments
3.	Evaluation	To assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgement, belief, or opinion; and to assess the logical strength of the actual or intend inferential relationships among statements, descriptions, questions, or other forms of representations.	Assessing claims Assessing arguments
4.	Inference	To identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypothesis; to consider relevant information and to reduce the consequences flowing from data, statements, principles, evidence, judgements, beliefs, opinions, concepts,	Querying evidence Conjecturing alternative Drawing conclusion



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	descriptions, questions, or other forms of representations.	
5. Explanation	To state the results of one's reasoning; to justify the reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments.	Stating results Justifying procedures Presenting arguments
6. Self-regulation	Self-consciously to monitor one's cognitive activities, the elements used in those activities, the results deduced, particularly by applying skills in analysis and evaluation to one's own inferential judgements with a view towards questioning, confirming, validating, or correcting either one's reasoning or one's results.	Self-examination Self-correction

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Source: Facione (1990)

The Delphi report has been used for the purpose of Educational Assessment and Instruction (Facione, 1990). The California Critical Thinking Disposition Inventory (CCTDI) uses the Delphi Report's consensus definition of critical thinking as the theoretical basis to measure critical thinking disposition (Facione et al., 2013; Jacob et al., 2017; Stahl & Stahl, 1991). The questionnaire utilises these skills and subskills to formulate its questions, inquiring whether individuals apply these skills when evaluating the credibility and authenticity of online content. In more recent studies, the Delphi Report was used to identify the children's level of critical thinking (Shao et al., 2022), to content analyse the level of critical thinking skills integrated into the tasks of selected textbooks (Ismajli & Neziri, 2019; Mohammed Al-Rahbi et al., 2022), and to elucidate the concept of self-efficacy (Chee-Chong et al., 2023). This report is used by research participants to understand media content. It was first widely accepted in philosophy, science, and education as a reliable way to measure critical thinking. The report provides clear explanations and examples of each thinking skill, making it a useful tool for researchers using it to evaluate various areas like language.

## 2.2 Critical Thinking

Dewey (1910) initially introduced the concept of critical thinking, and subsequently, scholars have put forth diverse definitions based on their individual perspectives. Benjamin Bloom is the most influential critical thinking theorist who plays a significant role in Malaysia's educational system. In the early 1990s, the concept of critical thinking was initially incorporated into the primary education curriculum in Malaysia, through the introduction of Bloom's Taxonomy. Bloom's Taxonomy, which is a hierarchical framework used to classify terminal educational learning objectives. It categorises these objectives into three domains: cognitive, affective, and psychomotor. Each domain represents different types of learning and provides a structured approach for educators to set educational goals (Anderson & Krathwohl, 2000). Terminal objectives refer to the specific, measurable outcomes at the end of a learning process. Subsequently, educators in Malaysia have adopted the practice of framing their questions, whether presented verbally or in written tests and exams, according to the verbs associated with the six levels of Bloom's taxonomy. The goal is for educators to design questions that effectively prompt students to engage in critical thinking and activate higher-order cognitive skills (Crowe et al., 2008; Huang et al., 2021). Following this, educators assess whether students have attained elevated levels of thinking based on their responses in the tests or exams.



At the National Defence University of Malaysia, critical thinking skills are part of the course curriculum. Stanley (2021) and Widiandari and Redhana (2021) suggested that teaching critical thinking often involves techniques like questioning and interactive methods such as group discussions, case studies, and problem-solving activities. These methods aim to help students analyse information, evaluate arguments, and express their opinions. Teaching critical thinking is a detailed process where instructors not only deliver course material but also ensure that questions align with the levels of critical thinking in Bloom's taxonomy. Choosing the right verbs for questions is a challenge, as some verbs can apply to multiple levels. Using verbs allows instructors to create critical thinking tasks based on various activities like listening or reading. Additionally, using a task-based approach helps instructors design tasks that lead students towards desired outcomes, as recommended by Westbrook (2014).

The construction of questions becomes increasingly complex, particularly during the assessment of students' abilities. To address these challenges, some faculties implement the Continuous Quality Improvement (CQI) procedure. This involves defining examination objectives and goals precisely, evaluating the structure, format, and content of exams, ensuring clarity in instructions, and analysing performance data from previous exams. Additionally, CQI requires regular monitoring of the exam administration process to promptly identify and rectify any issues that arise.

The effectiveness of teaching critical thinking using Bloom's taxonomy has been a topic of debate within educational circles (Bibi et al., 2020; Chandio et al., 2021; Oktaviana & Susiaty, 2020; Wiranata et al., 2021). While some educators advocate for its use as a valuable framework for structuring learning objectives and assessment criteria, others question its applicability and efficacy in fostering genuine critical thinking skills. Bloom's Taxonomy and the Delphi Report both tackle the development of critical thinking skills, albeit from distinct vantage points. Bloom's Taxonomy, formulated by Benjamin Bloom and his associates in 1956, presents a hierarchical structure categorising cognitive abilities into six tiers. Widely employed in educational settings, Bloom's Taxonomy aids in crafting learning goals, evaluations, and instructional activities. Emphasising cognitive abilities, it furnishes educators with a methodical means to foster advanced thinking. These stages, progressing from fundamental to advanced, encompass Remembering, Understanding, Applying, Analysing, Evaluating, and Creating.

On the other hand, the Delphi Report, also known as the Delphi Method, functions as a research methodology aimed at gathering expert perspectives on a designated subject. Within the domain of critical thinking, it delineates the essential skills and characteristics deemed necessary by authorities for proficient critical thinking. Originating from the American Philosophical Association (APA) in 1990, this method provides a systematic approach for identifying critical thinking requisites. The Delphi Report enumerates various cognitive skills and dispositions associated with critical thinking, encompassing Interpretation, Analysis, Evaluation, Inference, Explanation, Problem-solving, Reasoning, Open-mindedness, and Creativity.

Although there might be some overlap between the skills identified in the Delphi Report and those in Bloom's Taxonomy, the former offers a more intricate and comprehensive examination of critical thinking skills, including dispositional aspects such as open-mindedness and creativity



(Cruz et al., 2021; Evans, 2020). In essence, Bloom's Taxonomy furnishes a structured framework for cognitive skills, whereas the Delphi Report delves deeper into specific critical thinking skills and dispositions. Educators stand to benefit from both frameworks when developing instructional strategies to cultivate critical thinking among students. For this study, the Delphi Report was selected to evaluate the critical thinking abilities employed by students when they analyse new media information accessed online.

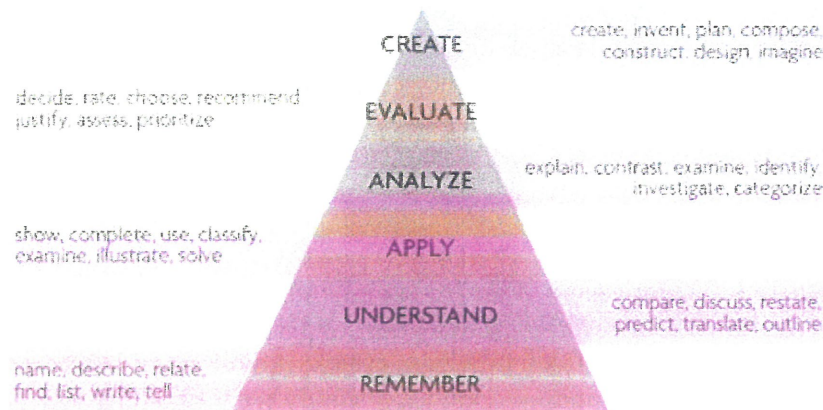


Figure 1: Bloom's Taxonomy  
Source: Westbrook (2014)

### 2.3 Media and Information Literacy

Jones and Procter (2023), and Turner (2020) claimed that Media and Information Literacy (MIL) is a crucial skill set in today's digital age, enabling individuals to access, evaluate, and critically analyse media content and information sources. To identify fake news effectively, several critical thinking skills are essential (Machete & Turpin, 2020; Phippen et al., 2021; Puig et al., 2021). Fišer and Držanič (2021) suggested that individuals need to develop the skill of scepticism, questioning the credibility and reliability of information presented to them. Additionally, Pal and Lamba (2024) added that the ability to verify sources and cross-reference information from multiple reputable sources is vital in identifying fake news. Critical evaluation of the context, tone, and potential biases of the information is also essential to discerning fake news. Moreover, individuals need to hone their analytical skills to detect logical fallacies, misinformation, and propaganda techniques commonly employed in fake news dissemination. Finally, the skill of media literacy, including understanding how news is produced, disseminated, and consumed, is crucial for navigating the complex media landscape and identifying fake news effectively (Jones-Jang et al., 2021). Through the cultivation of these critical thinking skills, individuals can become more discerning consumers of media and better equipped to combat the spread of misinformation and fake news.

Critical thinking and media literacy are intertwined competencies that are increasingly essential in today's digital age. Media literacy involves the ability to access, analyse, evaluate, and create media content across various platforms. Critical thinking, on the other hand, encompasses the skills of questioning, reasoning, analysing, and synthesising information to make informed judgments and decisions. When combined, critical thinking and media literacy empower individuals to navigate the vast and complex media landscape effectively. By critically evaluating media content,



including news, advertisements, and social media posts, individuals can discern credible sources, detect biases, and recognise misinformation and propaganda. Moreover, media literacy fosters an understanding of how media influences societal attitudes, values, and behaviours, enabling individuals to engage with media content in a thoughtful and responsible manner (Lido et al., 2021). Ultimately, the integration of critical thinking and media literacy skills equips individuals with the tools necessary to become informed and discerning consumers and creators of media content in the digital era.

### **3. Methodology**

#### **3.1 Participants**

The research included 340 students from seven faculties at the National Defence University of Malaysia. Students were chosen through convenience sampling. The link to the Google form was shared with lecturers, who then distributed it to their students. The questionnaire contained three social media posts, and participants indicated their agreement levels with statements focusing on critical thinking skills.

#### **3.2 Research Design and Data Collection**

A quantitative method was employed, creating an online questionnaire with Google Forms. Section A has eight demographic questions. Section B has six parts: (1) Interpretation, (2) Analysis, (3) Evaluation, (4) Inference, (5) Explanation, and (6) Self-regulation. Each part has five questions in both English and Bahasa Melayu, aligning with critical thinking skills from the Delphi Report. Section B has a total of 30 questions covering all parts. Data were collected through online Google Forms, and 340 completed questionnaires were available for analysis.

#### **3.3 Data Analysis Instruments**

In the study, data collection was carried out, and subsequently, descriptive statistical analysis was applied to analyse the collected data through comparison in mean scores. Information from Google Sheets was moved to Excel, and subsequently, the data from Excel were exported into SPSS v25.

#### **3.4 Reliability of the Questionnaire**

The reliability of the quantitative questionnaire was tested using SPSS where it depended on the value of Cronbach's alpha. Cronbach's alpha assesses the internal consistency of a set of items in a questionnaire, indicating how well the items are correlated with each other. A common rule of thumb is that a Cronbach's alpha of 0.70 or higher is considered acceptable.

#### **3.5 Test of Normality**

The Kolmogorov–Smirnov test is suitable for larger samples ( $n \geq 50$ ). In both tests, the null hypothesis assumes data are drawn from a normally distributed population. A p-value above 0.05 indicates acceptance of the null hypothesis and thus normally distributed data.

#### **3.6 Correlation Analysis**

The Spearman rank correlation coefficient, commonly known as Spearman's rho ( $\rho$ ), is a nonparametric measure of statistical dependence between two variables. It assesses how well the relationship between two variables can be described using a monotonic function, regardless of whether this function is linear or not.



## 4. Findings and Discussion

### 4.1 Reliability Analysis

The internal consistency of the Interpreting Media Information through Critical Thinking Scale (IMTCT-30) was evaluated via Cronbach's alpha, resulting in an exceptionally high value of 0.978. With 30 items gauging critical thinking skills on a 5-point Likert scale, this outcome underscores the scale's robust reliability in assessing the utilisation of critical thinking when interpreting media information.

Table 4: Reliability statistics

Cronbach's Alpha	N of Items
.978	30

### 4.2 Normality Test

The Kolmogorov-Smirnov test was employed to assess the normality of the distribution of scores for each critical thinking skill. The test revealed a statistic of  $D = 0.119, 0.154, 0.111, 0.079, 0.112,$  and  $0.089$ , with a significance level of  $\alpha = 0.05$ . As the p-value associated with this test statistic ( $p = 0.000$ ) which is less than the predetermined significance level, we failed to accept the null hypothesis. Therefore, it can be concluded that the distribution of scores in all groups does not follow a normal distribution.

Table 5: One-Sample Kolmogorov-Smirnov Test

		Interpretation	Analysis	Evaluation	Inference	Explanation	Self-Regulatory
N		340	340	340	340	340	340
Normal Parameters <sup>a,b</sup>	Mean	3.7453	3.8553	3.8571	3.7488	3.7947	3.7782
	Std. Deviation	.82837	.86900	.85485	.82317	.78697	.81686
Most Extreme Differences	Absolute	.119	.154	.111	.079	.112	.089
	Positive	.070	.094	.091	.066	.074	.072
	Negative	-.119	-.154	-.111	-.079	-.112	-.089
Test Statistic		.119	.154	.111	.079	.112	.089
Asymp. Sig. (2-tailed)		.000 <sup>c</sup>	.000 <sup>c</sup>	.000 <sup>c</sup>	.000 <sup>c</sup>	.000 <sup>c</sup>	.000 <sup>c</sup>

### 4.3 Correlation Analysis

Spearman's rho assesses the relationship based on the ranks of the data points. Spearman's rho ranges from -1 to 1, where:

$\rho = 1$  indicates a perfect positive rank correlation (as one variable increases, the other also increases).

$\rho = -1$  indicates a perfect negative rank correlation (as one variable increases, the other decreases).

$\rho = 0$  indicates no rank correlation (the variables are not associated).



**Table 6: Correlation analysis using Spearman's rho**

	CT skills	Interpretation (I)	Analysis (A)	Evaluation (E)	Inference (IN)	Explanation (EX)	Self-Regulatory (SR)
Spearman's rho	I	1.000	.792**	.721**	.694**	.791**	.692**
	A	.792**	1.000	.797**	.785**	.861**	.728**
	E	.721**	.797**	1.000	.802**	.798**	.767**
	IN	.694**	.785**	.802**	1.000	.882**	.800**
	EX	.791**	.861**	.798**	.882**	1.000	.838**
	SR	.692**	.728**	.767**	.800**	.838**	1.000

All these critical thinking skills are related to one another. Spearman's rank correlation coefficient revealed a strong positive correlation between Explanation (EX) and Self-Regulatory ( $\rho = 0.838$ ,  $p < 0.01$ ), indicating that as the skills Explanation increased, Self-Regulatory tended to increase. This is the same for any other 2 pairs of skill.

#### 4.4 Comparing Mean Scores for Critical Thinking Skills

**Table 7: Mean scores for six (6) critical thinking skills**

Critical Thinking skills	N	Minimum	Maximum	Mean	Std. Deviation
Interpretation	340	1.00	5.00	3.7453	.82837
Analysis	340	1.00	5.00	3.8553	.86900
Evaluation	340	1.00	5.00	3.8571	.85485
Inference	340	1.00	5.00	3.7488	.82317
Explanation	340	1.00	5.00	3.7947	.78697
Self-Regulatory	340	1.00	5.00	3.7782	.81686
Valid N (listwise)	340				

Samples predominantly utilised the "Evaluation" skill, with "Analysis" being the subsequent most utilised, followed by "Explanation". Conversely, the least employed skill for interpreting media information was the "Interpretation" skill. Evaluation and analysis are often more familiar and comfortable processes for individuals. They may have been exposed to these activities more frequently in their education (Hamaoui, 2023), leading to a greater inclination to use them. Nantha et al. (2022) claimed that evaluation and analysis are often perceived as more immediately relevant to decision-making and problem-solving tasks. Samples may prioritise these processes because they provide tangible outcomes or solutions to specific problems. Inference, explanation, and self-regulatory processes may be perceived as more complex or challenging compared to evaluation and analysis. Individuals may shy away from these processes due to a lack of confidence in their ability to effectively engage in them.



#### 4.5 Comparing Mean Scores According to Gender

Table 8: Mean scores according to gender

Gender		Interpretation	Analysis	Evaluation	Inference	Explanation	Self-Regulatory
Male	Mean	3.7788	3.8635	3.8677	3.7767	3.8265	3.8074
	N	189	189	189	189	189	189
	Std. Deviation	.86761	.87116	.88994	.83353	.77153	.77881
Female	Mean	3.7033	3.8450	3.8437	3.7139	3.7550	3.7417
	N	151	151	151	151	151	151
	Std. Deviation	.77730	.86908	.81155	.81142	.80670	.86335
Total	Mean	3.7453	3.8553	3.8571	3.7488	3.7947	3.7782
	N	340	340	340	340	340	340
	Std. Deviation	.82837	.86900	.85485	.82317	.78697	.81686

Examining the interpretation of media information reveals a tendency for male participants to demonstrate higher utilisation of critical thinking skills across all mentioned areas. Although the discrepancy in mean scores is not pronounced, it implies a greater application of critical thinking skills among male participants. For instance, for "Interpretation" skill, males scored an average of 3.7788 compared to 3.7033 for females. Research exploring gender disparities in critical thinking has yielded varied results. Marni et al. (2022) discovered that male "Inference" skill is better than female, and Azizi et al. (2022) found out that gender had no role to play in the critical thinking and critical thinking strategy use. Some research showed slight variations in specific aspects of critical thinking between genders, but overall, these differences are small and do not imply that one gender is better than the other in critical thinking skills. Gender differences in critical thinking are likely more affected by societal norms, cultural expectations, and educational experiences rather than biological disparities between males and females.

#### 4.6 Comparing Mean Scores According to Year of Study

Table 9: Mean scores according to year of study

Year of study		Interpretation	Analysis	Evaluation	Inference	Explanation	Self-Regulatory
Year 1	Mean	3.6923	3.7988	3.8142	3.6982	3.7160	3.7006
	N	169	169	169	169	169	169
	Std. Deviation	.88021	.95431	.96327	.88778	.84925	.86523
Year 2	Mean	3.6797	3.8266	3.7766	3.7109	3.7828	3.7047
	N	128	128	128	128	128	128
	Std. Deviation	.75351	.77698	.73114	.72255	.70231	.73258
Year 3	Mean	4.3419	4.2581	4.3032	4.2258	4.2645	4.3871
	N	31	31	31	31	31	31



	Std. Deviation	.63497	.65766	.62582	.70189	.61620	.63442
Year 4	Mean	3.3000	3.6667	3.9333	3.1667	3.4667	3.8333
	N	6	6	6	6	6	6
	Std. Deviation	.86487	.96056	.56095	.85245	.76594	.80416
> Year 4	Mean	4.0000	4.1667	4.4000	4.1000	4.1667	4.3333
	N	6	6	6	6	6	6
	Std. Deviation	.41952	.67429	.55136	.65422	.69761	.61536
Total	Mean	3.7453	3.8553	3.8571	3.7488	3.7947	3.7782
	N	340	340	340	340	340	340
	Std. Deviation	.82837	.86900	.85485	.82317	.78697	.81686

When considering the year of study, it indirectly compares older students' critical thinking abilities with younger ones. According to a study by Roohr and Burkander (2020), age consistently predicts critical thinking. The pattern shown in Table 10 suggests that as students advance in their academic years, they become better at using critical thinking skills. For instance, in the skill of "Evaluation", the mean score for Year 1 is 3.8142, whereas for Year 4 it is 4.4000. Similarly, in "Self-Regulatory" skills, the mean score for Year 2 is 3.7047, while for Year 4 it rises to 4.3333. This progression is unsurprising, as students typically experience an augmentation in critical thinking abilities as they advance in their studies. Such growth can be attributed to factors including accumulated knowledge and experience, exposure to diverse perspectives (Van Nguyen & Liu, 2021), and the natural development of self-awareness and reflection that often accompanies aging.

#### 4.7 Comparing mean scores according to Programme

**Table 11: Mean scores according to programmes**

Programme		Interpretation	Analysis	Evaluation	Inference	Explanation	Self-Regulatory
Degree	Mean	3.7525	3.8415	3.8521	3.7532	3.7955	3.7834
	N	265	265	265	265	265	265
	Std. Deviation	.81185	.86266	.83928	.82329	.78662	.81837
Diplo- ma	Mean	3.5333	3.7833	3.7208	3.5500	3.6833	3.6167
	N	48	48	48	48	48	48
	Std. Deviation	.83674	.84836	.87104	.74890	.70600	.73899
Found- ation	Mean	4.0519	4.1185	4.1481	4.0593	3.9852	4.0148
	N	27	27	27	27	27	27
	Std. Deviation	.89888	.95153	.93905	.87498	.91134	.89773
Total	Mean	3.7453	3.8553	3.8571	3.7488	3.7947	3.7782
	N	340	340	340	340	340	340
	Std. Deviation	.82837	.86900	.85485	.82317	.78697	.81686



The notable elevation in mean scores among the Foundation group is intriguing, particularly considering that this cohort is the youngest both in terms of age and academic year, yet they exhibit the highest mean scores across all critical thinking skills. One could argue this by suggesting that individuals from the Foundation group may be more accustomed to critical thinking, as they are students who have recently transitioned from school settings. Contrasting the mean scores between the Diploma and Degree samples revealed a rise in average scores. A degree student might exhibit better critical thinking skills compared to a diploma student because of a degree is a higher educational level than a diploma. Degree programmes typically involve more advanced coursework and rigorous academic standards compared to diploma programs. The extended duration of degree programmes allows for deeper exploration of subjects and greater emphasis on critical thinking skills development.

#### 4.8 Overall Discussion

In general, the objective of this study is to answer the following questions: Were critical thinking skills employed by the samples when interpreting media information? If so, which of the six critical thinking skills outlined in the Delphi report were utilised more frequently?

For all critical thinking skills, the level of agreement is “high” with mean scores above 3.7. So, samples do use critical thinking skills when they interpreted the three (3) snapshots of postings from social media. The data suggest that among the various critical thinking skills employed for interpreting media information, the "Evaluation" skill was the most frequently utilised by the samples, followed by "Analysis" and "Explanation." Conversely, the skill least utilised in this context was "Interpretation." This pattern can be attributed to several factors. Firstly, evaluation and analysis are often more familiar and comfortable processes for individuals, possibly due to their frequent exposure to these activities throughout their education. Additionally, these skills are perceived as more immediately relevant to decision-making and problem-solving tasks, providing tangible outcomes or solutions. As a result, samples may naturally prioritise evaluation and analysis when interpreting media information. On the other hand, inference, explanation, and self-regulatory processes may be perceived as more complex or challenging compared to evaluation and analysis. Individuals may lack these skills or the confidence in their ability to effectively engage in these processes, leading them to shy away from utilising them as frequently when interpreting media information.

Secondly, the examination of how individuals interpret media information indicates that male participants tend to demonstrate a higher utilisation of critical thinking skills across all the specified areas. Even though the difference in mean scores is not particularly pronounced, it does suggest a greater application of critical thinking skills among male participants. For instance, when looking at the "Interpretation" skill, male participants achieved an average score of 3.7788 compared to 3.7033 for females. Studies investigating gender disparities in critical thinking have yielded diverse findings. While some research has highlighted slight variances in specific facets of critical thinking between genders, the prevailing consensus suggests that these differences are minimal. Furthermore, such disparities do not imply inherent superiority of one gender over the other in critical thinking abilities. It is crucial to acknowledge that any observed gender gaps in critical thinking are likely influenced by societal expectations, cultural norms, and educational opportunities rather than inherent biological distinctions between males and females. These external factors can significantly shape individuals' attitudes, behaviours, and opportunities for



skill development, consequently influencing their performance in tasks that require critical thinking.

In addition to that, the observed trend suggests that as participants advance in their academic journey, they display an improved capacity to utilise critical thinking skills. This progression is expected, as students commonly undergo a refinement in their critical thinking abilities as they progress through their studies. Such advancement can be attributed to various factors, including the accumulation of knowledge and experience over time, exposure to diverse perspectives in academic pursuits, and the inherent development of self-awareness and reflection that often accompanies the aging process. As individuals engage with more complex academic material and encounter a broader range of challenges, they naturally develop and hone their critical thinking skills, leading to the observed enhancement in their ability to analyse, evaluate, and regulate their thought processes.

Lastly, comparing the mean scores of diploma and degree samples indicates an increase in average scores among degree students. The likelihood of a degree student demonstrating superior critical thinking skills compared to a diploma student is attributed to the higher educational level associated with a degree program. Degree programmes are characterised by more advanced coursework and stringent academic standards in comparison to diploma programs. The prolonged duration of degree programmes affords students opportunities for in-depth exploration of subjects and a heightened emphasis on the development of critical thinking skills. This disparity in educational levels translates into degree students being exposed to more complex and intellectually demanding challenges, fostering the refinement and enhancement of their critical thinking abilities. Consequently, degree students may demonstrate a higher proficiency in analytical reasoning, problem-solving, and decision-making compared to their counterparts in diploma programmes.

## 6. Conclusion

This study investigates participants' use of critical thinking skills in interpreting media information, identifying which skills were most prevalent. Mean scores above 3.7 indicate widespread utilisation of critical thinking skills, with "Evaluation" being the most common, followed by "Analysis" and "Explanation," while "Interpretation" was least utilised. This pattern is attributed to factors such as familiarity with evaluation and analysis and the perceived relevance of these skills to decision-making. Male participants tended to demonstrate higher utilisation of critical thinking skills, although gender differences were minimal overall. Participants showed improved critical thinking abilities as they progressed academically, likely influenced by accumulated knowledge and experiences. Furthermore, degree students exhibited higher mean scores compared to diploma students, reflecting the greater emphasis on critical thinking in advanced academic programmes.

The conclusion drawn from this study offers valuable insights into how participants utilise critical thinking skills when interpreting media information. Specifically, the observation that certain skills are more frequently utilised than others suggests that participants may lack familiarity with or proficiency in the less utilised skills. This discrepancy in skill utilisation implies that individuals may prioritise or rely more heavily on skills with which they are more familiar or comfortable, potentially neglecting others due to a lack of exposure or confidence. Identifying such patterns can



help highlight areas where individuals may benefit from additional training or support to enhance their critical thinking abilities across a broader range of skills. Overall, this observation underscores the importance of addressing skill gaps and promoting a more comprehensive approach to critical thinking development.

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