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The use of AI tools to enhance teaching pedagogy

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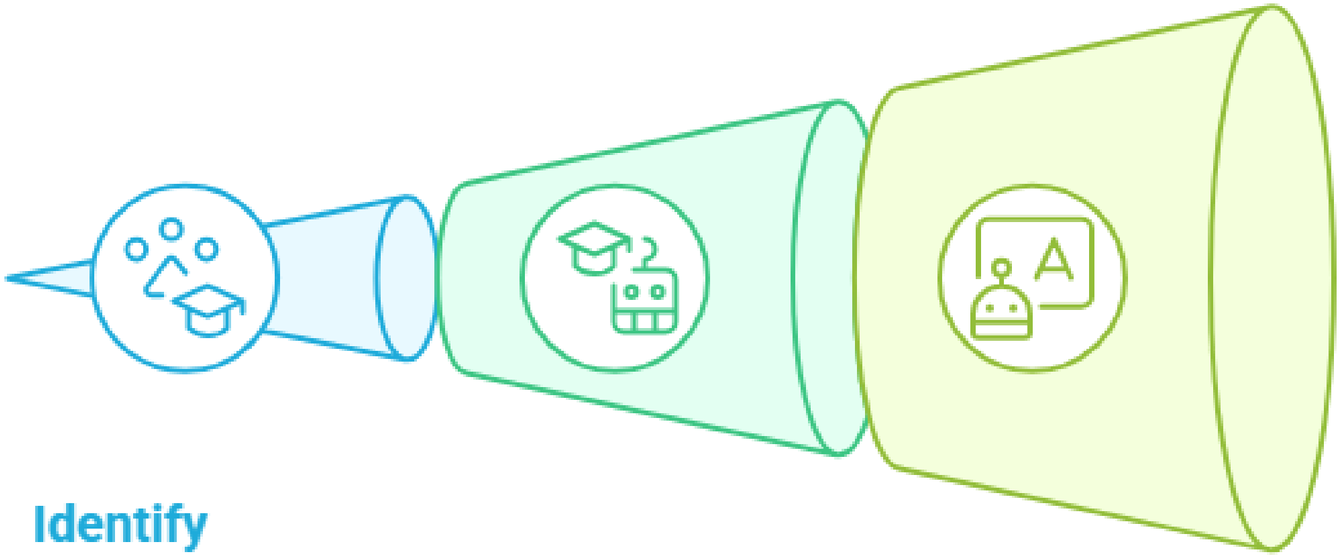
CONTENT



Identify Elements

Recognize core pedagogical components

Explore AI Tools

Investigate AI applications for education

Apply AI to Pedagogy

Use AI tools to support in Pedagogy

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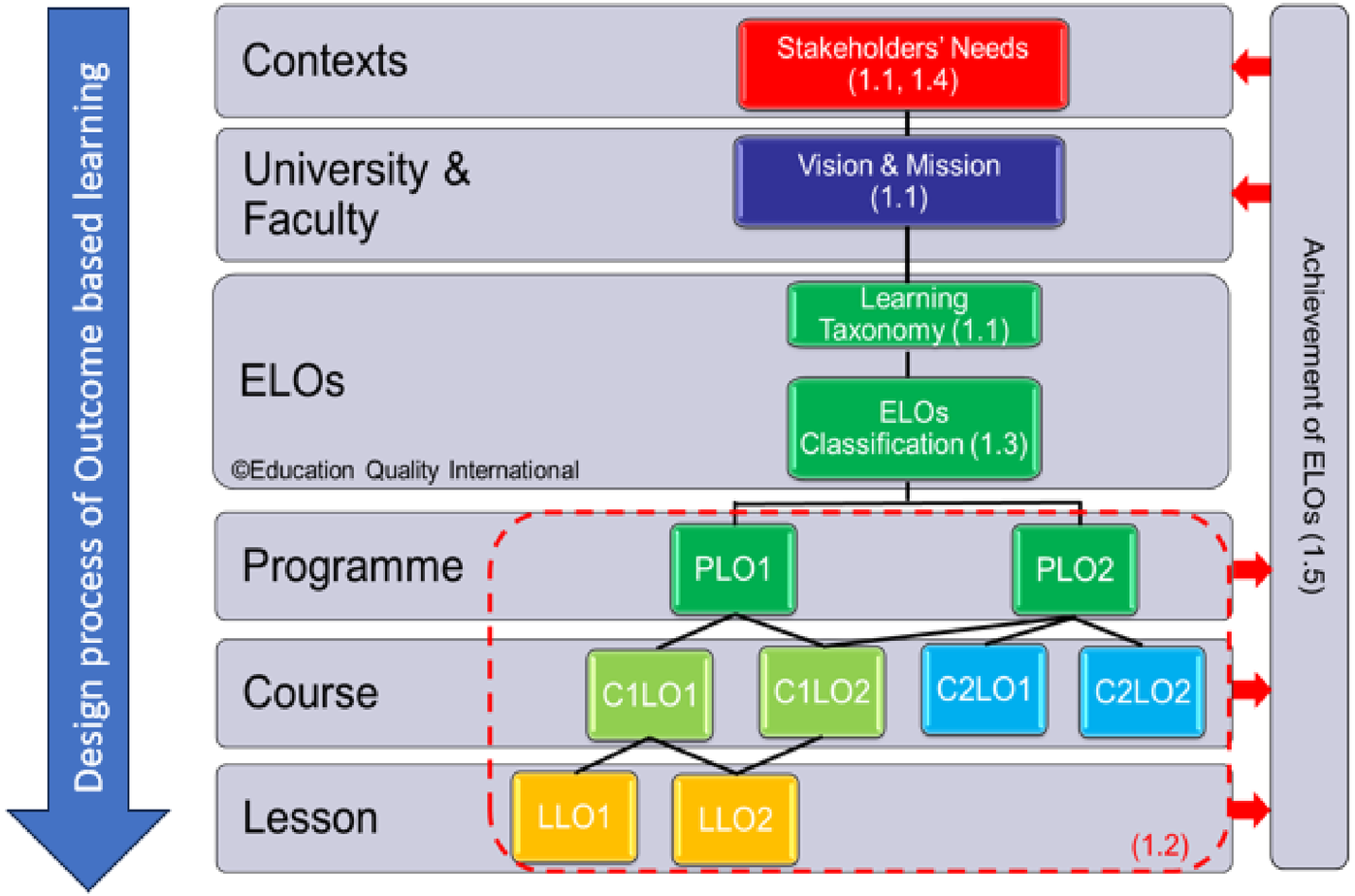
Terminology



- PEO: Program Education Outcome
- PLO: Program Learning Outcome
- CLO: Course Learning Outcome
- LLO: Lesson Learning Outcome
- Objective
- Bloom Taxonomy
- Lesson Plan
- Teaching and Learning activities
- Assessment Rubrics

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PEO

- **PEO 1 (Hard Skills)**
  Graduates will demonstrate advanced technical expertise in software engineering, enabling them to design, develop, and maintain innovative software solutions that meet industry standards and societal needs.
- **PEO 2 (Soft Skills)**
  Graduates will exhibit effective communication, teamwork, and leadership skills, enabling them to collaborate in diverse professional environments and contribute to organizational success.
- **PEO 3 (Lifelong Learning and Service to Community)**
  Graduates will engage in lifelong learning, ethical practices, and community service, contributing to societal development and adapting to emerging technologies and challenges.

PLO

- **PLO 1 (Knowledge)**
  Apply fundamental and advanced knowledge of mathematics, computing, and software engineering principles to solve complex problems.
- **PLO 2 (Cognitive Skills)**
  Analyze, evaluate, and synthesize information to design and implement software systems that meet specified requirements.
- **PLO 3 (Psychomotor Skills)**
  Demonstrate proficiency in using tools, technologies, and methodologies for software development and testing.
- **PLO 4 (Interpersonal Skills)**
  Work effectively in teams, demonstrating collaboration, conflict resolution, and leadership abilities.
- **PLO 5 (Responsibility)**
  Exhibit accountability and responsibility in professional practice, adhering to ethical and legal standards.
- **PLO 6 (Entrepreneurial Skills)**
  Develop innovative solutions and business models, demonstrating entrepreneurial thinking and problem-solving.
- **PLO 7 (Ethics and Professionalism)**
  Uphold ethical principles and professionalism in software engineering practice, considering societal and environmental impacts.
- **PLO 8 (Communication Skills)**
  Communicate technical information effectively through written, oral, and visual means to diverse audiences.
- **PLO 9 (Digital Skills)**
  Utilize digital tools and platforms to enhance productivity, collaboration, and innovation in software development.
- **PLO 10 (Numerical Skills)**
  Apply mathematical and statistical techniques to analyze data and solve computational problems.

Objective

- Develop technical proficiency in software design, development, and maintenance.
- Cultivate strong problem-solving and analytical skills.
- Encourage lifelong learning and professional development.
- Foster collaboration with interdisciplinary teams.

CLO

Vision	Missions	PEOs	PLO	1	LD1	Knowledge	MD1	Knowledge	Cognitive	C6 (Bloom Taxonomy)	CLOs	LLOs	Pedagogies	Assessment
			PLO	2	LD2	Cognitive	MD2							
			PLO	3	LD3	Psychomotor	MD3	Skill	Psychomotor	P7				
			PLO	4	LD4	Interpersonal Skill	MD4	Attitude	Affection	A5				
			PLO	5	LD5	Responsibility	MD4							
			PLO	6	LD6	Entrepeneur	MD4							
			PLO	7	LD7	Ethics and Professionalism	MD4							
			PLO	8	LD8	Communication	MD5	KSA	CAP	C(6)				
			PLO	9	LD9	ICT	MD5			A(5)				
			PLO	10	LD10	Numerical	MD5			P(7)				

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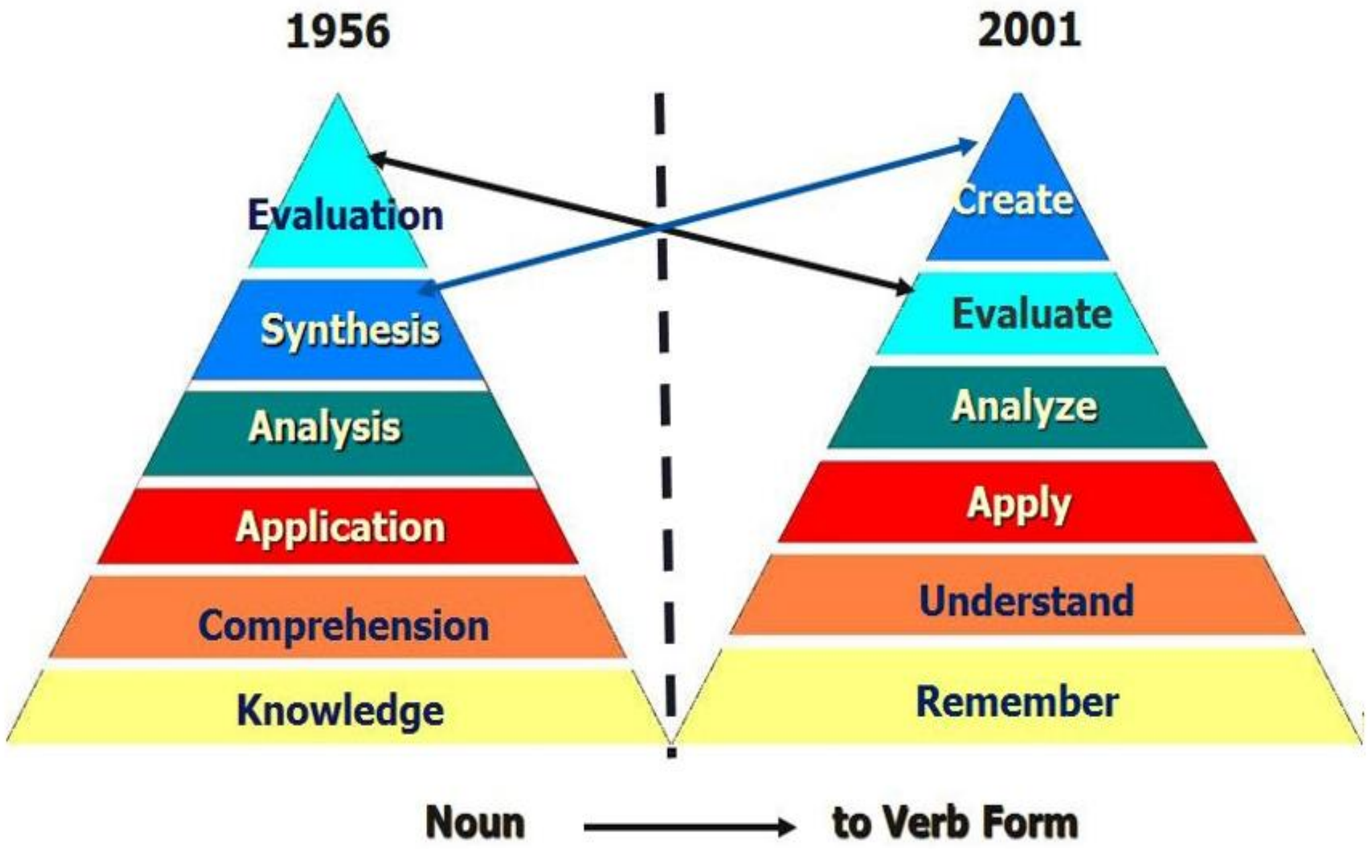

01	02	03	04	05	06
KNOWLEDGE:	UNDERSTAND:	APPLY:	ANALYZE:	EVALUATE:	CREATE:
Define, Identify, Describe, Recognize, Tell, Explain, Recite, Memorize, Illustrate, Quote	Summarize, Interpret, Classify, Compare, Contrast, Infer, Relate, Extract, Paraphrase, Cite	Solve, Change, Relate, Complete, Use, Sketch, Teach, Articulate, Discover, Transfer	Contrast, Connect, Relate, Devise, Correlate, Illustrate, Distill, Conclude, Categorize, Take Apart	Criticize, Reframe, Judge, Defend, Appraise, Value, Prioritize, Plan, Grade, Reframe	Design, Modify, Role-Play, Develop, Rewrite, Pivot, Modify, Collaborate, Invent, Write

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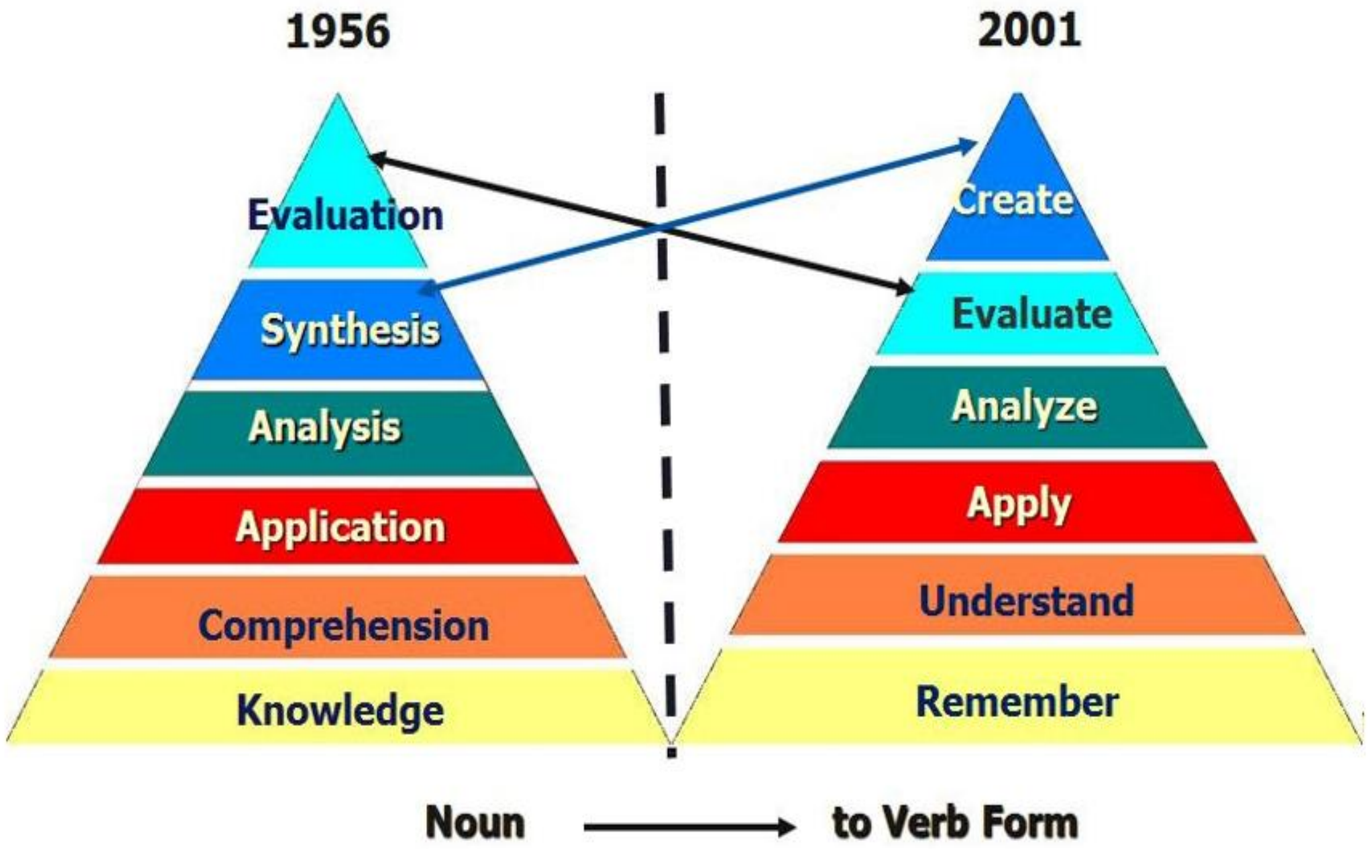

Bloom's Taxonomy – Revised
Cognitive Domain

Bloom's Taxonomy has been revised by Anderson and Krathwohl (2001) with new terms and emphasis. This adapted Bloom's model has *Knowledge* converted to *Remember* and the highest level of development is *Creating* rather than *Evaluate*.

Category	Generic Skills	Sample Verbs
Remembering **Recalling information**	The learner is able to recall, restate and remember learned information.	Choose, Cite, Enumerate, Group, Label, List, Listen, Locate, Match, Memorize, Name, Outline, Quote, Read, Recall, Recite, Record, Relate, Repeat, Reproduce, Review, Select, Show, Sort, State, Underline, Write
Understanding **Explaining ideas or concepts**	The learner grasps the meaning of information by interpreting and translating what has been learned.	Account for, Annotate, Associate, Classify, Convert, Define, Describe, Discuss, Estimate, Explain, Express, Identify, Indicate, Interpret, Observe, Outline, Recognize, Reorganize, Report, Research, Restate, Retell, Review, Translate
Applying **Using information in another familiar situation**	The learner makes use of information in a new situation from the one in which it was learned.	Adapt, Apply, Calculate, Change, Collect, Compute, Construct, Demonstrate, Dramatize, Draw, Exhibit, Generalize, Illustrate, Interpret, Interview, Make, Manipulate, Operate, Paint, Practice, Sequence, Show, Sketch, Solve, Translate
Analyzing **(Critical Thinking)** **Breaking information into parts to explore understandings and relationships**	The learner breaks learned information into its parts to best understand that information in an attempt to identify evidence for a conclusion.	Analyze, Appraise, Arrange, Calculate, Categorize, Compare, Contrast, Criticize, Debate, Detect, Diagram, Discriminate, Dissect, Distinguish, Examine, Experiment, Group, Infer, Inquire, Inspect, Investigate, Order, Probe, Question, Relate, Research, Scrutinize, Separate, Sequence, Sift, Subdivide, Summarize, Survey, Test
Evaluating **(Critical Thinking)** **Justifying a decision or course of action**	The learner makes decisions based on in-depth reflection, criticism and assessment.	Appraise, Argue, Assess, Choose, Compare, Conclude, Criticize, Critique, Debate, Decide, Deduce, Defend, Determine, Differentiate, Discriminate, Evaluate, Infer, Judge, Justify, Measure, Predict, Prioritize, Probe, Rank, Rate, Recommend, Revise, Score, Select, Validate, Value
Creating **(Critical Thinking)** **Generating new ideas, products, or ways of viewing things**	The learner creates new ideas and information using what has been previously learned.	Act, Assemble, Blend, Combine, Compile, Compose, Concoct, Construct, Create, Design, Develop, Devise, Formulate, Forecast, Generate, Hypothesize, Imagine, Invent, Organize, Originate, Predict, Plan, Prepare, Propose, Produce, Set up

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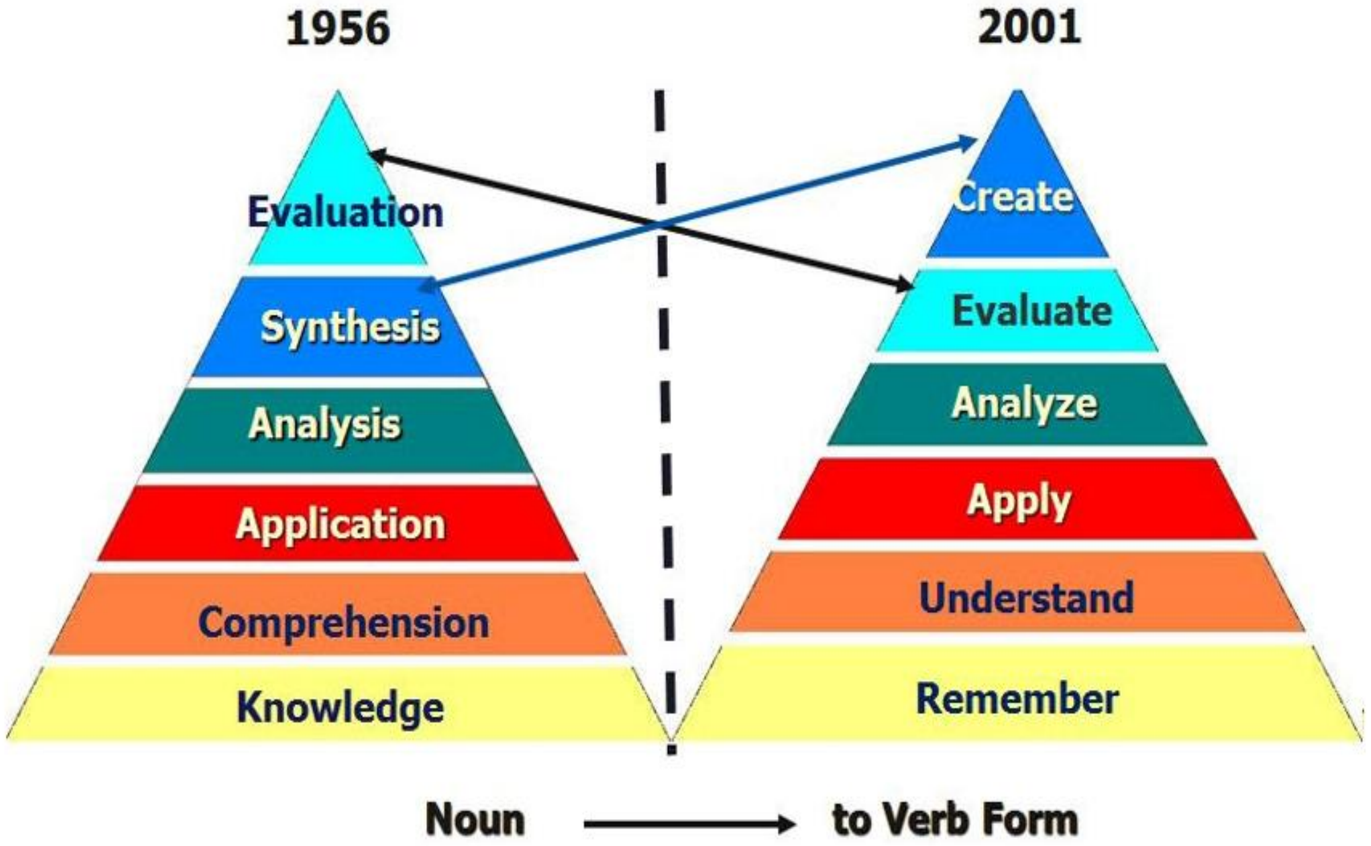
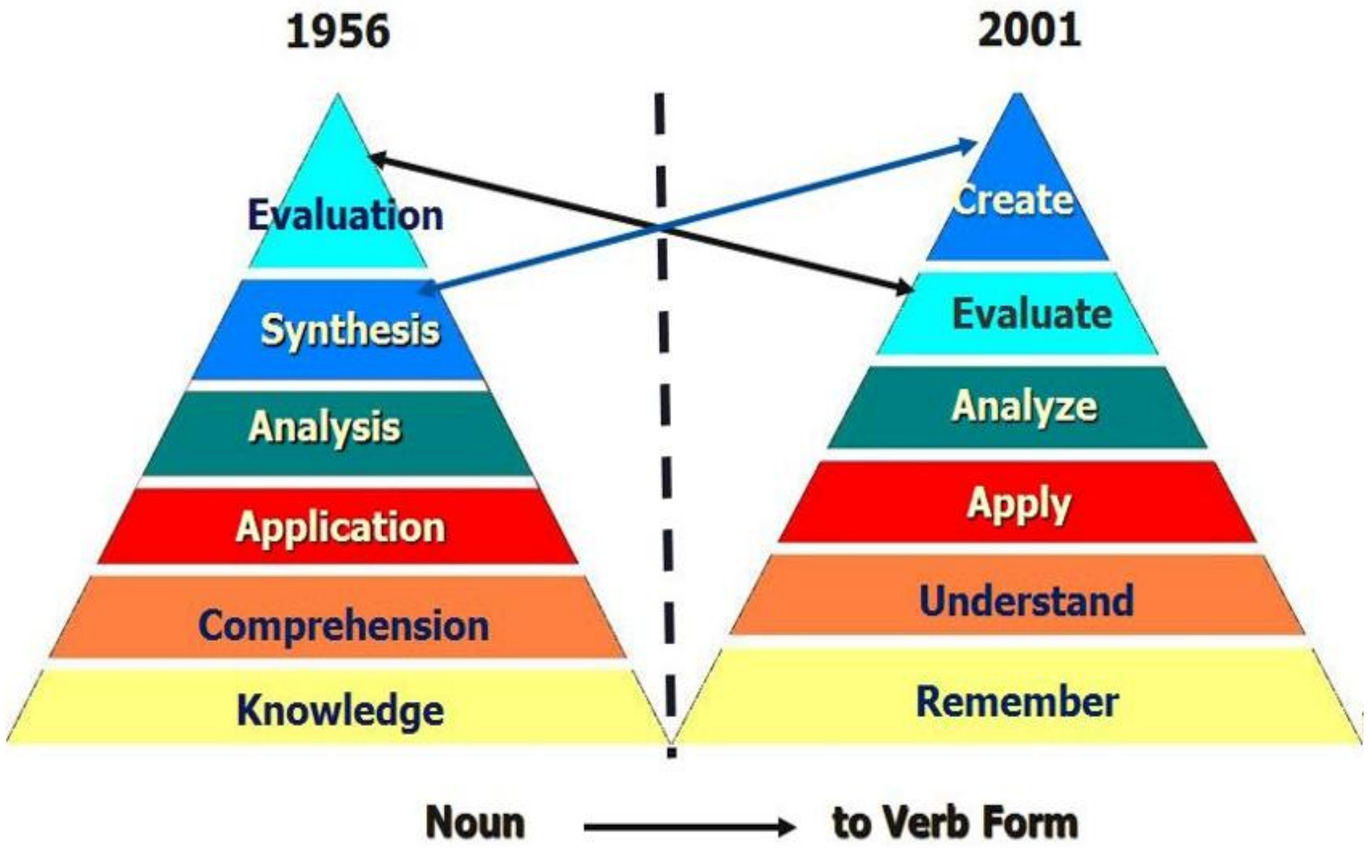


Bloom's Taxonomy – Revised
Affective Domain

These learning outcomes relate to attitudes, behaviors, and values. This is also now commonly expressed in the modern field of personal development as 'beliefs' and their retention by and affect upon the learner.

Category	Generic Skills	Sample Verbs
Receiving (Awareness)	The learner becomes aware of an attitude, behavior, or value and is open to the experience.	Accept, Acknowledge, Ask, Attend, Describe, Explain, Follow, Focus, Listen, Locate, Observe, Realize, Receive, Recognize, Retain
Responding (React)	The learner exhibits a reaction or change as a result of exposure to an attitude, behavior, or value.	Behave, Cite, Clarify, Comply, Contribute, Cooperate, Discuss, Examine, Follow, Interpret, Model, Perform, Present, Question, React, Respond, Show, Studies
Valuing (Comprehend and act)	The learner recognizes value and displays this personal opinion through involvement or commitment.	Accept, Adapt, Argue, Balance, Challenge, Choose, Confront, Criticize, Debate, Differentiate, Defend, Influence, Justify, Persuade, Prefer, Recognize, Refute, Seek, Value
Organizing (Personal value system)	The learner reconciles internal conflicts and determines a new value or behavior as important or a priority.	Adapt, Adjust, Alter, Arrange, Build, Change, Compare, Contrast, Customize, Develop, Formulate, Improve, Manipulate, Modify, Practice, Prioritize, Reconcile, Relate, Revise
Internalizing (Adopt behavior)	The learner integrates consistent behavior as a naturalized value in spite of discomfort or cost. The value is recognized as a part of the person's character.	Act, Authenticate, Characterize, Defend, Display, Embody, Habituate, Influence, Internalize, Practice, Produce, Represent, Solve, Validate, Verify

CLO



Bloom's Taxonomy – Revised
Psychomotor Domain

These learning outcomes relate to the development of physical skills and manual tasks. However it also concerns and covers modern day business and social skills such as communications (public speaking) and the operation of equipment.

Category	Generic Skills	Sample Verbs
Observe (Awareness)	The learner translates sensory input into physical tasks or activities.	Hear, Identify, Notice, Observe, See, Smell, Taste, Touch, Watch
Model (Copy)	The learner is able to observe and replicate a fundamental skill or task.	Adhere, Attempt, Copy, Follow, Imitate, Mimic, Model, Reenact, Re-create, Repeat, Replicate, Reproduce, Show, Try
Recognize Standards (Follow instructions)	The learner recognizes standards or criteria important to perform a skill or task correctly.	Build, Check, Demonstrate, Detect, Discriminate, Differentiate, Distinguish, Execute, Implement, Notice, Perceive, Perform, Recognize, Select
Correct (Develop precision)	The learner utilizes standards to evaluate his/her own performances, make corrections and execute the skill reliably independent of assistance.	Adjust, Alter, Calibrate, Change, Complete, Construct, Correct, Customize, Improve, Integrate, Manipulate, Modify, Practice, Revise
Articulation (Combine & integrate related skills)	The learner applies a selected skill to real life situations.	Adapt, Build, Combine, Compose, Construct, Coordinate, Create, Develop, Formulate, Integrate, Master, Originate, Produce, Solve
Naturalization (Automate & master)	The learner is more automated with an unconscious mastery of an activity and related skills.	Demonstrate, Design, Exhibit, Illustrate, Invent, Instruct, Manage, Re-design, Specify, Teach, Train, Troubleshoot

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CLO

Module 1: Recognize the ethical landscape of data practitioner (PLO1,PLO2,PLO7)
Module 2: Identify the key principles of the data privacy through regulation perspective (PLO1,PLO2,PLO5)
Module 3: Choose the right techniques to protect data privacy(PLO3,PLO9,PLO10)

CLO 1: Define ethical principles and their application in data practices. MD1, LD1	K/C	Module 1
CLO 2: Demonstrate awareness of ethical obligations in data handling. MD4, LD7	A/A	Module 1
CLO 3: Evaluate the effectiveness of data privacy regulations. MD2, LD2	K/C	Module 2
CLO 4: Understand the legal and ethical consequences of data breaches. MD4, LD5	A/A	Module 2
CLO 5: Demonstrate proficiency in implementing data privacy techniques MD3, LD3	S/P	Module 3
CLO 6: Utilize technology tools for data privacy protection MD5, LD9	S/P	Module 3

Lecture 2: What ethically significant harms and benefits can data present?
LLO 1: Reproduce the definition of Ethics
LLO 2: Classify different level of the life interest
LLO 3: Identify the potential ethical benefit and risk associate with data collection, analysis and use

Lecture 3: Common ethical challenges for data practitioners and users
LLO 1: Define useful terminology
LLO 2: Classify different data life cycle
LLO 3: Identify the challenges of data practitioners and users

Lecture 4: What are data practitioners' obligations to the public?
LLO 1: Identify the source of ethical duties
LLO 2: Classify the stakeholder as data practitioners
LLO 3: Understand the conflict of interest of stakeholders

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Instructional Strategy

- Inquiry-Based Learning
- Project-Based Learning (PBL)
- Think-Pair-Share
- Jigsaw Method
- Peer Teaching
- Case Studies
- Debate
- Gallery Walk
- Elevator Pitch
- Role play
- KWL: Know, Want-to-Know, Learned

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Assessment

- MCQs
- Short Answer Test
- Essay
- Performance Test
- Written Test
- Fieldwork/Practicum
- Projects
- Laboratory Test
- Thesis
- Presentation
- Portfolios
- Case Studies
- Posters
- Journals/Blogs

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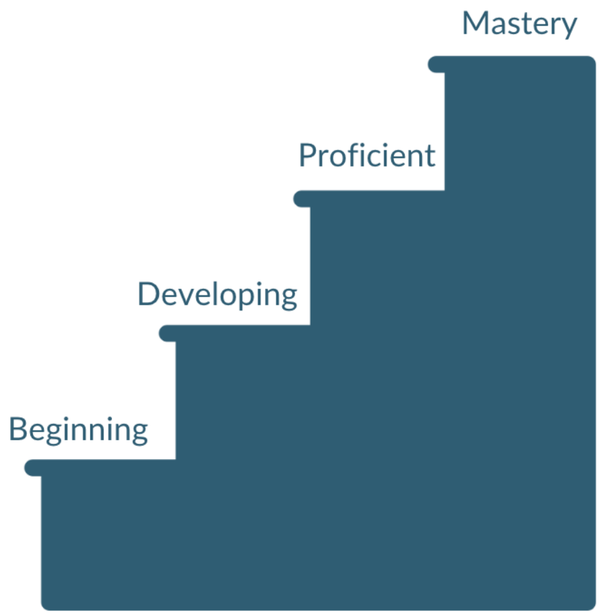
RUBRICS



4- Point Mastery-based, Standard-aligned Rubric

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Criteria	Beginning 1	Developing 2	Proficient 3	Mastery 4
Researching a Problem	Identifies some sources of information about a problem.	Identifies key sources of information about a problem and explains why they are important.	Effectively researches a problem using a variety of methods and sources of information.	Effectively research a problem using various methods and sources of information, and I can evaluate the quality and reliability of different sources.
Solution Design	Designs a solution to a problem but doesn't address key criteria and constraints.	Designs a solution to a problem that addresses some key criteria and constraints.	Designs a solution to a problem that effectively addresses key criteria and constraints.	Designs a creative solution to a complex problem that addresses multiple criteria and constraints.
Communication & Collaboration	Explains solutions to others but does not use scientific language or evidence to support ideas or claims.	Explains solutions to others using scientific language and evidence and listens to feedback from others.	Communicates solutions using scientific language and evidence. Listens and responds to feedback from others.	Effectively communicates solutions using scientific language and evidence. Listens actively, responds to feedback from others, and uses their peers' ideas to improve solution design.

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RUBRICS

		Poor	Passable	Excellent	Comments
1	**Source Problems (5%)**	1 2 3 4	5 6 7	8 9 10	
2	**Secondary Problems (10%)**				
	- clarity of definition	1 2 3 4	5 6 7	8 9 10	
	- comprehensiveness	1 2 3 4	5 6 7	8 9 10	
3	**Analysis (45%)**				
	- application of concepts	1 2 3 4	5 6 7	8 9 10	
	- data analysis (financial, marketing)	1 2 3 4	5 6 7	8 9 10	
	- use of critical reasoning skills	1 2 3 4	5 6 7	8 9 10	
4	**Recommended Alternative (10%)**				
	- is justification convincing?	1 2 3 4	5 6 7	8 9 10	
	- use of theory to justify	1 2 3 4	5 6 7	8 9 10	
5	**Overall Presentation Standard (10%)**				
	- structure and organisation	1 2 3 4	5 6 7	8 9 10	
	- writing mechanics	1 2 3 4	5 6 7	8 9 10	
	- proof reading	1 2 3 4	5 6 7	8 9 10	
	- referencing	1 2 3 4	5 6 7	8 9 10	
	- bibliography	1 2 3 4	5 6 7	8 9 10	

AI Tools

https://chatgpt.com/?ref=dotcom

https://gemini.google.com/app

https://www.deepseek.com/

https://grok.com/?referrer=website

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PROMPTS

Create a Program Specification of **Software Engineering** by writing a complete PEO and PLO of the program using bloom taxonomy verbs. There are 3 Program Education Outcome (PEO), PEO 1 related to Hard Skill, PEO 2 related to soft skills, PEO 3 related to life long learning and service to community. By having 10 Program Learning Outcome (PLO), PLO1 knowledge, PLO2 Cognitive, PLO3 Psychomotor, PLO4 Interpersonal skill, PLO5 Responsibility, PLO6 Entrepreneur, PLO7 Ethic and Professionalism, PLO8 Communication, PLO9 Digital Skill, PLO10 Numerical skill. After that create a 5 years program, each year has 8 courses with 30 credits in total and mentioned all the necessary courses Name, Credit, Hour, Course description, Course Learning Outcome. Finally do the mapping between Course Learning Outcome of each course to the Program Learning Outcome and make sure it is algin very well and also cover the minimum level of Knowledge, Skill and Attitude.

PROMPTS

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SOFTWARE ENGINEERING PROGRAM

Program Education Outcomes (PEOs)

1. **PEO 1 (Hard Skills)**
   Graduates will demonstrate advanced technical expertise in software engineering, enabling them to design, develop, and maintain innovative software solutions that meet industry standards and societal needs.
2. **PEO 2 (Soft Skills)**
   Graduates will exhibit effective communication, teamwork, and leadership skills, enabling them to collaborate in diverse professional environments and contribute to organizational success.
3. **PEO 3 (Lifelong Learning and Service to Community)**
   Graduates will engage in lifelong learning, ethical practices, and community service, contributing to societal development and adapting to emerging technologies and challenges.

Program Learning Outcomes (PLOs)

1. **PLO 1 (Knowledge)**
   Apply fundamental and advanced knowledge of mathematics, computing, and software engineering principles to solve complex problems.
2. **PLO 2 (Cognitive Skills)**
   Analyze, evaluate, and synthesize information to design and implement software systems that meet specified requirements.
3. **PLO 3 (Psychomotor Skills)**
   Demonstrate proficiency in using tools, technologies, and methodologies for software development and testing.
4. **PLO 4 (Interpersonal Skills)**
   Work effectively in teams, demonstrating collaboration, conflict resolution, and leadership abilities.
5. **PLO 5 (Responsibility)**
   Exhibit accountability and responsibility in professional practice, adhering to ethical and legal standards.
6. **PLO 6 (Entrepreneurial Skills)**
   Develop innovative solutions and business models, demonstrating entrepreneurial thinking and problem-solving.
7. **PLO 7 (Ethics and Professionalism)**
   Uphold ethical principles and professionalism in software engineering practice, considering societal and environmental impacts.
8. **PLO 8 (Communication Skills)**
   Communicate technical information effectively through written, oral, and visual means to diverse audiences.
9. **PLO 9 (Digital Skills)**
   Utilize digital tools and platforms to enhance productivity, collaboration, and innovation in software development.
10. **PLO 10 (Numerical Skills)**
    Apply mathematical and statistical techniques to analyze data and solve computational problems.

5-Year Program Structure

Each year consists of **8 courses** totaling **30 credits**. Below is the breakdown:

Year 1

Course Name	Credits	Hours	Course Description	Course Learning Outcomes (CLOs)
Introduction to Programming	4	60	Basics of programming, algorithms, and problem-solving using Python.	1. Write simple programs using Python. 2. Explain basic programming concepts.
Discrete Mathematics	3	45	Fundamentals of logic, sets, relations, and combinatorics.	1. Solve problems using discrete structures. 2. Apply logical reasoning.
Computer Fundamentals	3	45	Overview of computer architecture, operating systems, and networks.	1. Describe computer components. 2. Explain basic networking concepts.
English for Communication	3	45	Develop written and oral communication skills.	1. Write clear technical documents. 2. Deliver effective presentations.
Calculus	3	45	Fundamentals of differential and integral calculus.	1. Solve calculus problems. 2. Apply calculus to real-world scenarios.
Ethics and Professionalism	2	30	Introduction to ethical principles and professional conduct.	1. Identify ethical dilemmas. 2. Apply ethical decision-making.
Digital Literacy	3	45	Basics of digital tools, cybersecurity, and online collaboration.	1. Use digital tools effectively. 2. Explain cybersecurity principles.
Introduction to Entrepreneurship	3	45	Basics of entrepreneurship and business planning.	1. Develop a business idea. 2. Create a simple business plan.

Year 2

Course Name	Credits	Hours	Course Description	Course Learning Outcomes (CLOs)
Data Structures and Algorithms	4	60	Study of data structures (e.g., stacks, queues, trees) and algorithms.	1. Implement data structures. 2. Analyze algorithm efficiency.
Object-Oriented Programming	4	60	Principles of OOP using Java.	1. Design OOP solutions. 2. Develop Java applications.
Database Systems	3	45	Introduction to database design and SQL.	1. Design relational databases. 2. Write SQL queries.

PROMPTS

This mapping ensures that all **10 PLOs** are adequately covered across the 5-year program, with a balance of **knowledge**, **skills**, and **attitudes**. Each CLO is aligned with the relevant PLO(s) to meet the program's educational objectives.

Visual Representation of CLO-to-PLO Mapping

Year 1

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
Introduction to Programming	✓		✓				✓			
Discrete Mathematics	✓	✓							✓	
Computer Fundamentals	✓							✓		
English for Communication				✓			✓			
Calculus	✓	✓							✓	
Ethics and Professionalism						✓				
Digital Literacy						✓		✓		
Introduction to Entrepreneurship					✓		✓			

Year 2

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
Data Structures and Algorithms	✓	✓	✓						✓	
Object-Oriented Programming	✓	✓	✓					✓		
Database Systems	✓		✓					✓		
Probability and Statistics	✓	✓							✓	
Technical Writing							✓			
Software Engineering Basics	✓	✓	✓			✓				
Web Development			✓					✓		
Teamwork and Leadership				✓	✓					

Year 3

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
Software Design and Architecture		✓	✓							
Operating Systems	✓	✓							✓	
Human-Computer Interaction		✓	✓	✓						
Software Testing			✓				✓			
Data Science Fundamentals		✓	✓							✓
Project Management					✓	✓				
Mobile App Development			✓						✓	
Community Service Project					✓		✓			

Year 4

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
Cloud Computing			✓						✓	
Artificial Intelligence		✓	✓				✓			
Cybersecurity		✓	✓				✓			
Software Project I		✓	✓	✓	✓					
Advanced Database Systems		✓	✓							
Entrepreneurship in Tech						✓		✓		
Professional Ethics in IT							✓			
Research Methods	✓							✓		

Year 5

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
Software Project II			✓	✓	✓			✓		

Course	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8	PLO 9	PLO 10
Big Data Analytics		✓	✓							✓
Internet of Things (IoT)		✓	✓						✓	
Advanced Software Engineering		✓	✓						✓	
Innovation and Creativity						✓		✓		
Global Citizenship					✓		✓			
Career Development				✓				✓		
Elective Course	✓	✓	✓							

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PROMPTS

Create a rubric of Research Writing with 4 levels such as beginner, developing, proficient mastery with some criteria and the score range from 0 to 100.

Research Writing Rubric

Criteria	Beginner (0–25)	Developing (26–50)	Proficient (51–75)	Mastery (76–100)
Thesis/Argument	Thesis is unclear, absent, or overly vague. Argument lacks focus or purpose.	Thesis is present but weak or overly broad. Argument is underdeveloped.	Thesis is clear and focused. Argument is logical and mostly well-supported.	Thesis is insightful, specific, and compelling. Argument is fully developed and persuasive.
Research & Evidence	Little to no evidence or research provided. Sources, if any, are irrelevant or unreliable.	Some evidence is included, but it's limited or inconsistently relevant. Sources may lack credibility.	Solid evidence supports claims. Sources are credible and mostly well-integrated.	Extensive, high-quality research enhances argument. Sources are authoritative, varied, and seamlessly integrated.
Organization	Structure is confusing or nonexistent. Ideas are disjointed with no clear flow.	Basic structure exists but transitions are weak. Ideas may feel scattered.	Clear structure with logical flow. Transitions are effective, though minor lapses may occur.	Exemplary organization with smooth transitions. Ideas flow cohesively from start to finish.
Clarity & Style	Writing is unclear, with frequent errors in grammar, syntax, or vocabulary.	Writing is understandable but lacks polish. Errors distract from meaning.	Writing is clear and engaging, with minimal errors. Style suits the purpose.	Writing is eloquent, precise, and engaging. Style elevates the work with no errors.
Citations & Formatting	Citations are missing, incorrect, or inconsistent. Formatting is haphazard.	Citations are present but contain errors. Formatting follows some guidelines.	Citations are mostly accurate. Formatting adheres to a standard (e.g., APA, MLA).	Citations are flawless and consistent. Formatting is professional and perfectly aligned with standards.

Scoring Guide

- **0–25 (Beginner):** Demonstrates minimal understanding of research writing principles. Significant improvement needed.
- **26–50 (Developing):** Shows basic skills but lacks consistency and depth. More practice and refinement required.
- **51–75 (Proficient):** Exhibits competent research writing skills with room for polish and sophistication.
- **76–100 (Mastery):** Reflects advanced mastery of research writing, with exceptional quality and professionalism.

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