

Innovative Teaching Strategies in the AI Age: AI-Powered Instructional Design

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OUTLINE



Background

- i. Definitions of instructional design for enhancing educational practices and optimizing learning experiences;
- ii. Alignment of pedagogically-driven approaches to instructional design grounded in learning theories;
- iii. A comparative overview of traditional vs. AI-driven instructional design.



AI-Driven Instructional Design

- i. Key benefits of AI-driven instructional design;
- ii. Opportunities and challenges of AI-driven instructional design.



IICA-TDLE Project

- i. IICA-TDLE project overview and key deliverable;
- ii. IDEAL-Gen.AI platform: key features;
- iii. Main takeaways

INTENDED LEARNING OUTCOMES

By the end of this session, you should be able to:

- 1 **Differentiate** between traditional and AI-driven instructional design approaches;
- 2 **Assess** how pedagogy informs AI-driven instructional design and how it can enhance teaching and learning;
- 3 **Explore** the benefits of AI-driven instructional design for learner engagement and outcomes;
- 4 **Identify** key features of the IDEAL-Gen.AI platform and its application in enhancing your instructional design practice.

In alignment with Lingnan's strategic initiative of “**Optimising Liberal Arts Education in the Digital Era**”

UGC and QAC to drive long-term development of virtual teaching and learning

The University Grants Committee (UGC) and the Quality Assurance Council (QAC) will allocate additional funding of \$165 million to support the eight UGC-funded universities in implementing various initiatives between 2021 and 2023 to promote the strategic development of virtual teaching and learning (VTL) in the medium to long run.

Since the outbreak of the COVID-19 pandemic, online teaching has been widely adopted and has become the prevalent mode of teaching and learning as the universities suspended face-to-face classes most of the time. Both the UGC and the QAC believe that, after the pandemic, universities will continue to make use of VTL to enhance the overall effectiveness and experience of teaching and learning. The UGC and the QAC will thus allocate additional funding of \$165 million (including \$15 million dedicated to inter-institutional collaborative activities) to the eight UGC-funded universities to facilitate more systemic collaborations among them to promote the strategic development of VTL in the medium to long run.

The universities are welcome to deploy the additional funding to implement a diverse range of project initiatives, including:

- (1) developing the governance framework, assessment methods, quality assurance system and professional best practices of VTL;
- (2) enriching the overall educational experience of virtual learning, such as organising staff development and encouraging interaction among students during online classes;
- (3) exploring new strategies, pedagogies, platforms and facilities in pursuit of longer-term visions on VTL; and
- (4) promoting the integration of VTL into scenarios such as practicums and on-site training.

The Chairman of the UGC, Mr Carlson Tong, said, "Teaching and learning is the most important mission of universities and enhancing teaching quality is crucial to the nurturing of talents. The UGC has all along attached great importance to the development of teaching and learning and we devote substantial resources to the

The UGC's strategic plans are the means of ensuring commitment to “exploring new strategies, **pedagogies, platforms** and facilities in pursuit of longer-term visions on virtual teaching and learning.”

IMPACT OF COVID-19 ON GLOBAL EDUCATION

Rapid Shift to Virtual Teaching

Teachers were compelled to transition swiftly to a fully virtual approach, removing the need for face-to-face interactions.

Beyond Technical Challenges

The move to virtual learning is not just a technical issue; it is a significant pedagogical and instructional design challenge.

Pedagogical Adaptations:

- Redesign instructional design strategies to fit a virtual format.
- Develop engaging learning that fosters interaction, engagement and higher-order thinking.

Technological Adaptations:

- Integrate appropriate technologies to support instructional design and delivery.

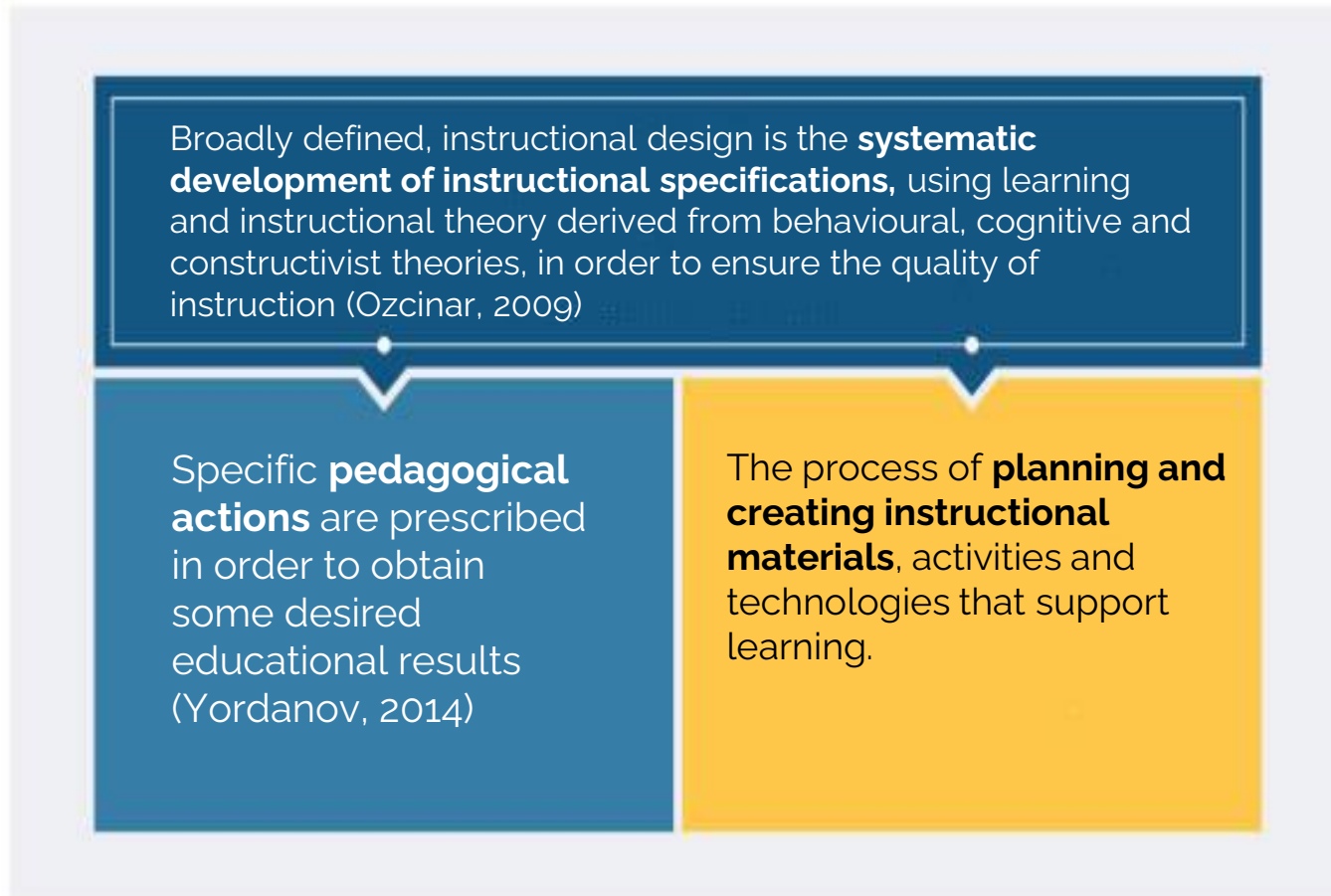
Transforming Learning Environments

Challenge is to create a learning environment that is:

- Engaging
- Interactive
- Collaborative

INSTRUCTIONAL DESIGN NEEDS TO BE
LEARNER-CENTERED

DEFINING INSTRUCTIONAL DESIGN



Ozcinar, Z. (2009). The topic of instructional design in research journals: A citation analysis for the years 1980-2008. *Australasian Journal of Educational Technology*, 25(4).

Yordanov, L. A. (2014). Hermeneutic grounds for the interpretation of the concept "Instructional Design". *Austrian Journal of Humanities and Social Sciences*, (3-4), 115-116.

COMPARATIVE OVERVIEW: TRADITIONAL VS. AI-DRIVEN INSTRUCTIONAL DESIGN

Aspect	Traditional Instructional Design	AI-Driven Instructional Design
Approach to Learning	Adopts a one-size-fits-all model; primarily relies on lecture-based content delivery (Gagné et al., 2005).	Personalized; adapts to individual learner needs and learning context.
Content Creation	Manual, labor-intensive process reliant on educator expertise (Smith & Ragan, 2005).	Automated, efficient generation powered by Generative AI (e.g., Large Language Models), reducing creation time.
Feedback Mechanisms	Delayed, post-assessment feedback, limiting timely improvement (Reiser & Dempsey, 2012).	Instant feedback from intelligent systems for immediate adjustment.
Data Utilization	Limited, subjective analytics; lacks systematic tracking of learner performance and progress.	Leverages robust, data-driven analytics to monitor performance, predict outcomes and refine instruction.
Scalability	Constrained by human resources, physical classroom settings and/or size (Reiser & Dempsey, 2012).	Highly scalable with global reach potential.

References:

- Gagné, R. M., Briggs, L. J., & Wager, W. W. (2005). Principles of Instructional Design. Wiley Online Library.
- Reiser, R. A., & Dempsey, J. V. (2012). Trends and Issues in Instructional Design and Technology. Pearson.
- Smith, P. L., & Ragan, T. J. (2005). Instructional Design. Wiley.

KEY BENEFITS OF AI-DRIVEN INSTRUCTIONAL DESIGN

Benefit	Description	Impact	Source
Personalised Instruction	Tailors learning materials to individual needs, enhancing engagement and relevance.	Increases student motivation and retention and mastery of concepts.	• Chen, C., & Liu, G. (2021). (Explores how AI tailors learning to individual needs, improving engagement and outcomes.)
Efficiency	Streamlines the content creation process using AI, saving time for educators to focus on teaching.	Frees up significant time for educators, enhancing classroom interaction and instructional quality.	• Crompton, H., & Burke, D. (2024). (Explores AI-driven automation in content creation.)
Flexibility	Adapts seamlessly to various educational environments, including in-person, online, and hybrid formats, catering to diverse learning contexts.	Meets diverse learner needs effectively.	• Zawacki-Richter, O., & Latchem, C. (2024). (Examines AI's adaptability across learning modalities.)
Dynamic Content Creation	Generates contextually relevant learning materials quickly and efficiently.	Keeps students engaged and informed, enhancing their learning experience with relevant and timely information.	• Hao, K., & Yang, Y. (2023). (Focuses on AI's ability to produce timely, context-specific educational content.)
Support for Active Learning	Facilitates interactive and engaging learning experiences through tailored content.	Develops higher-order thinking skills, deeper conceptual understanding, interaction through active engagement	• Roll, I., & Wylie, R. (2024). (Focuses on advancements in AI for active learning.)

OPPORTUNITIES AND CHALLENGES OF AI-DRIVEN INSTRUCTIONAL DESIGN

Opportunities:

- **Enhanced Personalization:** AI tailors content to individual learner needs, enhancing engagement, interaction and learning outcomes.
- **Improved Efficiency:** Automates content creation, saving time for educators.

Challenges:

- **Ethical Implications:** Concerns about data privacy, consent and the potential misuse of AI-generated content.
- **Over-Reliance:** Excessive dependence on AI risks diminishing creativity and expertise among educators.
- **Quality of Generated Content:** Variability in the relevance and accuracy of AI-generated materials, requiring careful human review and editing.
- **Bias Baked into AI:** AI may produce inaccurate or shallow outputs;
- **Teacher Autonomy & Professional Development:** AI should augment, not replace the role of teachers. Ongoing professional development is essential.

IICA-TDLE PROJECT OVERVIEW

<https://www.vtl-standards.hk/vtl-tdle-project>

1

Objective: To enhance **virtual teaching and learning (VTL)** across Hong Kong's eight publicly-funded universities.

2

Funding: Supported by the University Grants Committee (UGC), Hong Kong.

3

Collaborating Institutions: Four participating universities led by Lingnan, with collaboration and funding from HKUST and in-kind support from the CUHK and PolyU.

4

Key Deliverable: A comprehensive **instructional design platform** that offers a suite of integrated tools specifically developed to optimize the learning design and instructional content creation process.



IDEAL-Gen.AI (Instructional Design Enhanced Active Learning through Generative Artificial Intelligence)

Enhancing Instructional Design with AI-Driven Customization

- Platform leverages generative AI capabilities of Large Language Models (LLMs), representing a significant advancement in learning design and instructional content creation;
- Users can specify detailed criteria against a wide range of filtering options and customizable prompts, allowing for tailored instructional content that closely aligns with specific pedagogical needs and preferences.

Target Users

- Instructional designers, curriculum developers, teachers, instructors and educators at all levels;

Accessibility & User Engagement

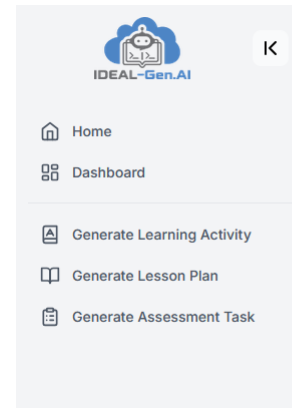
- Completely free to use, unlike subscription-based models/competitors;
- Available to educators worldwide, not limited to Hong Kong.



IDEAL-Gen.AI: KEY FEATURES

■ AI-Powered Content Creation

Leverage Gen-AI and LLMs: Generate high-quality, customized discipline-specific learning activities, lesson plans and assessment tasks tailored to specific pedagogical needs;



Filters

DISCIPLINE

(e.g., Mathemat

USE OF TECHNOI

Select an option

CLASS SIZE

Select an option

PREPARATION TII

Customize Instructional Design: Specify criteria across extensive filtering options (e.g., subject discipline, area of study, degree level, technology use, class size, activity size, learning space, delivery method, rubric criteria level);



Filters

[Reset All](#)

DISCIPLINE

(e.g., Mathematics)

AREA OF STUDY

(e.g., Algebra, Statistics, Geometry)

USE OF TECHNOLOGY

Select an option

DEGREE LEVEL

Select an option

CLASS SIZE

Select an option

ACTIVITY SIZE

Select an option

PREPARATION TIME

Select an option

LEARNING SPACE

Select an option

PHASE OF SESSION

Select an option

ACTIVITY DURATION

Select an option

PEDAGOGICAL LEARNING MODEL

- ☐ Authentic learning
- ☐ Problem-based learning
- ☐ Inquiry-based learning
- ☐ Collaborative learning

+ Other

- ☐ Experiential learning
- ☐ Case-base learning
- ☐ Self-directed learning
- ☐ Peer-assisted learning

LEARNING OBJECTIVE

- ☐ Remember
- ☐ Apply
- ☐ Evaluate

+ Other

- ☐ Understand
- ☐ Analyze
- ☐ Create

IDEAL-Gen.AI: KEY FEATURES

■ AI-Powered Content Creation

Automatic Prompt Generator

Feature: Generate prompts that are fully editable and customizable, enabling users to enhance and fine-tune them to align with their unique instructional design requirements.

Support of Pedagogical Principles:

Aligns with Bloom's taxonomy and instructional design models, integrating established frameworks like ADDIE and HKQF.

[Reset All](#)  **Automatic Prompt Generator**
Generate Learning Activity

AREA OF STUDY

DEGREE LEVEL

ACTIVITY SIZE

LEARNING SPACE

ACTIVITY DURATION

☐ Experiential learning
☒ Case-base learning
☐ Self-directed learning
☐ Peer-assisted learning

☒ Understand
☐ Analyze
☐ Create

☐ Analyze
☐ Critique
☐ Explain
☐ Other

☐ Apply
☐ Evaluate
☐ Interpret

☐ ADDIE (Analysis, Design, Development, Implementation, Evaluation)
☐ Bloom's Taxonomy
☐ ASSURE Model
☐ Other

☐ SAM (Successive Approximation Model)
☐ Rapid Prototyping Model

Generate an elaborate and detailed learning activity plan that adheres to the following criteria:

Discipline: Mathematics
Area of study: Algebra

Technology-enabled: recommend an appropriate technology that complements the learning activity and a provide a detailed set of instructions on how this technology will be integrated into the activity.

The activity is to be designed specifically for Associate students.

The activity must be suitable for a class size of 100+ students students.

The activity must be suitable for an activity size of Large group > 10.

The instructor's preparation time for the activity should be Less than 10 minutes.

The activity is intended for a Lecture theatre.

The activity will take place during the Pre-class.

The activity duration should be Less than 10 minutes.

Apply Authentic learning, Case-base learning in the activity.

The activity should aim to achieve the learning objective of Understand.

Provide the following in your learning activity plan:

Title and Description: Assign a descriptive title and provide a succinct overview of the activity, including its purpose and what it aims to achieve. Provide 2-3 clear and measurable learning objectives.

Step-by-Step Guide: provide a comprehensive, step-by-step guide that outlines a clear, actionable and concise process for executing the activity.

Materials and Resources: Identify the key content, materials and resources that will be used to support the learning activity. Explain how these elements align with the defined learning outcomes.

[Generate Learning Activity](#)

MAIN TAKEAWAYS

1

Learner-Centered Design is Essential: Effective instructional design prioritizes learner engagement, delivering content tailored to their needs for impactful learning experiences;

2

IDEAL-Gen.AI's Distinct Advantage: Developed by educators for educators, the platform revolutionizes AI-driven instructional design with tailored, pedagogically-driven solutions that exceed generic tools relying on one-size-fits-all templates that produce generic outputs.

3

Unmatched Competitive Edge: Unlike Magic School AI, LessonPlansAI, and AutoClassMate, IDEAL-Gen.AI offers unparalleled customization and personalization, setting a new standard in the AI-driven educational technology landscape.

4

Teacher Autonomy & Professional Development: AI should augment, not replace the role of teachers. Ongoing professional development is essential for educators to effectively integrate AI tools into their teaching practice.



Thank you

