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Published by:
Academy of Language Studies, Universiti Teknologi MARA
Cawangan Johor, Kampus Pasir Gudang, Jalan Purnama,
Bandar Seri Alam, 81750 Masai, Johor Darul Ta'zim.
07-3818455
edgii.apbpg@gmail.com

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e-ISBN : 978-967-0033-31-0

Published date: 2025

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Preface

Pioneering Educational Perspectives: Series 2025 is a collection of thought-provoking insights and research contributions exploring contemporary educational trends and practices. This eBook presents a diverse range of perspectives on innovative teaching methodologies, digital learning strategies, and transformative approaches in education. Designed to serve as a resource for educators, researchers, and practitioners, it aims to inspire meaningful discussions and advancements in the field. Through carefully curated chapters, this publication offers fresh ideas and practical solutions to enhance learning experiences in an ever-evolving educational landscape.

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Contents

e-FinLex (e-FINANCIAL LEXICON) 349

Umi Insyirah Pakasa[1], Joycelyne Anak Nyandang[2]*, Norazimah Mejri[3] & Azlan Yusof Punding[4] 349

PRESERVING AND PROMOTING *DONDANG SAYANG* THROUGH MUSIC TRANSCRIPTION AND EDUCATION 353

Md Jais Ismail[1*], Tee Yong Lai[2] & Vinisha Rajendran[3] 353

INNOVATIVE PROBLEM SOLVING AND VISUALIZATION LEARNING AIDS (PROVA) FOR EXTREMUM OF FUNCTIONS 358

Ng Set Foong[1*] & Foo Fong Yeng[2] 358

TIME TO ENGLISH (TTE): TYPES OF SENTENCE 362

Nur Fadzilah Muhamad Zamani[1]*, Ira Syaqira Sukimin[2], Norhafizah Amir[3], Shahira Adam[4] & Susanna Bithiah Varma[5] 362

EMPOWERING STUDENTS WITH THE 4P'S SOMA FRAMEWORK: A NEW APPROACH TO CRITICAL THINKING AND REFLECTIVE LEARNING 366

Arenawati Sehat Binti Omar[1]* & Zalina Binti Mohd. Desa[2] 366

INNOVATIVE ANDRAGOGY: LEVERAGING AI AND ONLINE PLATFORMS TO ENHANCE ADULT LEARNING OUTCOMES 372

Hamidah Md Yusop[1*] & Zoel-Fazlee Omar[2] 372

MOOC WAVES AND OPTICS 376

Mohd Zaki Mohd Yusoff[1]*, Muhammad Firdaus Othman[2], Suraya Ahmad Kamil[3], Siti Zafirah Zainal Abidin[4] & Zalina Zainal Abidin[5] 376

PADLET UNBOXED: THE DIGITAL ENGAGEMENT EXPERIENCE 379

Nur Shuhada Ya'acob[1*] 379

CTU EASY ACCESS CENTER 383

Syaimak Ismail[1]* & Azhar Abdul Rahman[2] 383

KAEDAH ORANG LIDI (PIK) DALAM PENULISAN KARANGAN BM SPM KSSM 387

Mohamad Jalil bin Mohamad Yunus[1*] & Norhayati binti Mat Ali[2] 387

UTILIZING MOOCS FOR HOLISTIC LEARNING IN HALAL CERTIFICATION STANDARDS AND QURANIC AND HADITH COURSES 392

Nurulaina Saidin[1]*, Mohd Ashrof Zaki Yaakob[2], Fadilah Abd Rahman[3] Mohd Asmadi Yakob[4] & Hanifah Musa Fathullah Harun[5] 392

DbAPedia – LEARNING PLATFORM FOR DATABASE ADMINISTRATION COURSE 396

Norshadila Ahmad Badela[1*] & Mohd Noor Halmy Ab Latif[2] 396

ENGINEERING DESIGN: A GUIDE TO FINAL YEAR PROJECT (FYP) 400

Matzaini Katon* & Norhanifah Abdul Rahman 400

ENHANCING HTML LEARNING THROUGH REAL-TIME OPEN-SOURCE TOOLS 404

e-ISBN: 978-967-0033-31-0

MOOC WAVES AND OPTICS

Mohd Zaki Mohd Yusoff[1]*, Muhammad Firdaus Othman[2], Suraya Ahmad Kamil[3], Siti Zafirah Zainal Abidin[4] & Zalina Zainal Abidin[5]

[1,3,4]School of Physics and Materials, Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Malaysia
[2]Fakulti Sains Gunaan, UiTM Cawangan Pahang, Kampus Jengka, 26400 Bandar Tun Abdul Razak Jengka, Pahang, Malaysia
[5]Fakulti Sains Gunaan, Universiti Teknologi Mara Cawangan Perlis Kampus Arau, 02600 Arau, Perlis, Malaysia

**Corresponding author: zaki7231@uitm.edu.my*

ABSTRACT
The project aims to make physics more accessible and relevant for all learners by utilizing a MOOC that focuses on waves and optics, essential in everyday activities like communication, cooking, and medical testing. The MOOC covers 14 chapters, with continuous assessments contributing 50% of marks and final assessments contributing another 50%. The learning process involves reviewing content, engaging in activities and assessments, and providing feedback. The MOOC is designed using a reflective cycle approach, with four major cycles: Plan, Learn, Apply, and Reflect. The online nature allows students to learn at any time and from any location, making it more engaging and accessible. The design of the MOOC offers benefits to mankind by making complex physics concepts accessible and engaging for a global audience, enhancing the quality of education, promoting lifelong learning, and supporting environmental sustainability. The market potential for MOOCs is significant, with lower costs compared to traditional education and competitive advantages such as scalability and collaboration with other universities.

KEYWORDS: MOOC, Waves, Optics, Interactive, Physics

PROBLEM AND OBJECTIVE
There are many studies that investigated the difficulty learning of wave optics either at the university or secondary school level (Bitzenbauer, 2021, Planinic et al., 2024, Mešić et al., 2016). Previous studies have shown that understanding the concept of physics is directly related to mental and visual development (Greca & Moreira, 1997). Mental visual development can be linked to external visuals (Nersessian 2010, Gilbert, Reiner & Nakhleh 2007)). In this project, we applied the visualisation method to simplify the waves and optics content. The visualisation method is believed to help students understand the concept of wave optics. Our objectives are to facilitate online interaction between learners and instructors and help students maximise their student learning time (SLT).

DESIGN DESCRIPTION
The MOOC aims to make physics more accessible and relevant for all learners. It focuses on waves and optics, essential in everyday activities like communication, cooking, and medical testing. The course covers 14 chapters, with continuous assessments contributing 50% of marks and final assessments contributing another 50%. The MOOC is developed using a reflective cycle approach, with four major cycles: Plan, Learn, Apply, and Reflect. The learning process

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involves reviewing content, engaging in activities and assessments, and providing feedback. The course materials are organized using an overview menu, and students can access lecture notes for detailed explanations. The MOOC uses Google Forms for assessment, with grades and answers released immediately after submission. Feedback is collected to improve the MOOC's effectiveness.

VISUALS

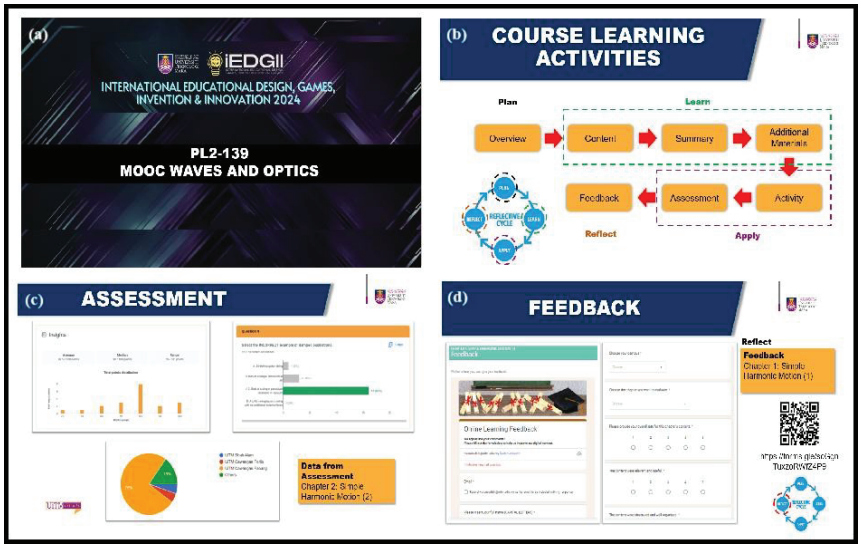


Figure 1. (a) Frontpage of slides, (b) course learning activities, (c) assessment and (d) feedback.

NOVELTY AND UNIQUENESS

The online nature of the information allows students to learn at any time and from any location, which is a distinctive feature of this MOOC. Since there is no cap on attendance, the issue with space can be avoided. Because it is more interactive and incorporates enjoyable learning tasks, it is a more engaging teaching strategy. Additionally, anyone at UiTM can access it for free. Other students used the MOOC website to access. We appreciate everyone who has watched our video.

BENEFITS TO MANKIND

The design of the "Waves and Optics" MOOC offers significant benefits to mankind by making complex physics concepts accessible and engaging for a global audience. It enhances the quality of education by accommodating diverse learning styles, which can improve understanding and memory retention. By promoting lifelong learning and innovation, it contributes to the development of skills crucial for technological and scientific advancements. Additionally, this MOOC supports environmental sustainability by reducing the need for physical resources through digital education, thereby minimizing its carbon footprint.

COMMERCIAL POTENTIAL

The market potential for MOOCs is significant. With lower costs compared to traditional education, MOOCs are appealing to a broad audience, including those in developing regions who might not have access to high-quality education otherwise. MOOCs have several competitive advantages as MOOCs provide high-quality education from top institutions to learners worldwide, breaking down geographical and financial barriers. Scalability is a core

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strength of the MOOC model, where online platforms can handle a large number of concurrent users. MOOCs offer collaboration with other universities, sharing revenue generated from course fees. This model leverages institutional credibility and attracts learners seeking high-quality content.

CONCLUSION

As a conclusion, MOOC Waves and Optics is offer integrated teaching and learning based on the reflective learning cycle. By enrolling this MOOC, we can indirectly contribute to the Sustainable Development Goals (SDG) such as No. 4: Quality Education and No. 16: Peace, Justice and Strong Institutions where everyone has right to learn without discrimination in terms of time, place and financial constraints. With feedback from broader users, it will help us to improve the effectiveness of this MOOC and enhance our institution reputation continuously.

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