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# Developing a Learning Playlist for Magnetic Fields as a Supplementary Material for Junior High School

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# DEVELOPING A LEARNING PLAYLIST FOR MAGNETIC FIELDS AS A SUPPLEMENTARY MATERIAL FOR JUNIOR HIGH SCHOOL

An Undergraduate Thesis
Presented to
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In Partial Fulfillment of the Requirements
for the course 2S-SCI03
(Science Research 2)

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## APPROVAL SHEET

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## ABSTRACT

Name: Aiza Mae S. Agunat & John Edward S. Otero

Title of the Study: Developing a Learning Playlist for Magnetic Fields as a Supplementary Material for Junior High School

Key Concepts: Short-form videos, Learning Playlist

Specialization: Bachelor of Science Education with Specialization in Physics

Adviser: Marie Paz E. Morales, PhD

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This developmental study aimed to design and validate a 5E-based learning playlist on Magnetic Fields using short-form videos as supplementary material for Junior High School Physics. Magnetic fields are inherently abstract and often difficult for learners to visualize, leading to persistent misconceptions; thus, multimedia support is essential (Mayer, 2005). Short-form videos, when concise and well-structured, can enhance microlearning, engagement, and conceptual clarity while minimizing cognitive load (Sweller, 1988; Buzzetto-More, 2015). The study followed a descriptive developmental design. A total of nine (9) short-form videos were curated and aligned with the Engage, Explore, Explain, and Elaborate phases of the 5E Instructional Model. The playlist was validated by three subject matter experts using a quantitative evaluation tool measuring accuracy, clarity, and pedagogical appropriateness.

Descriptive statistics were used to summarize the validation results. Findings showed high mean ratings across criteria, indicating strong content validity and instructional usefulness. The experts affirmed that the playlist effectively integrates short-form videos with inquiry-based learning, supporting visualization of magnetic field patterns and real-world applications. The study concludes that a carefully curated 5E-aligned playlist can serve as an effective supplementary material for enhancing JHS Physics learning.

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We also extend our thanks to one another as research partners for our teamwork and dedication.

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## ACRONYMS

EMT……………………………………………………………Electromagnetic Theory

LMS……………………………………………………..Learning Management System

SFV…………………………………………………………………Short Form Videos

SME…………………………………………………………….Subject Matter Experts

SDG……………………………………………………Sustainable Development Goal

TPACK…………………………………Technological Pedagogical Content Knowledge

# CHAPTER 1

# THE PROBLEM AND LITERATURE REVIEW

This chapter includes the background of the study, the literature review, the research problems, the conceptual framework, and the definition of terms used in the study.

## Background of the Study

Quality Education is a fundamental foundation for sustainable development, as highlighted by Sustainable Development Goal (SDG) 4, which advocates for inclusive and quality education. Therefore, effective instructional strategies need to be explored to enhance students' understanding of basic concepts in physics, In Electromagnetic Theory, particularly Magnetic Field. These laws form the foundation of classical mechanics. Overcoming these challenges calls for creative teaching approaches that suit contemporary learners' needs, including short videos as teaching tools.

Research has consistently shown that students do not come to the classroom as blank slates rather that they come with a well-established understanding about how and why everyday things behave as they do (Patil et al., 2019). Misconceptions are very common in all topics of physics, such as mechanics (Koranto & Resbiantoro , 2022). One of the significant findings of studies on misconceptions is that students' misconceptions must be taken into account by teachers for significant learning to occur. A study by Büyükbayraktar & Dilber (2016) explored the misconceptions held by 98 Grade 11 students regarding magnetism, the results of which shown 15 accumulated misconceptions about magnets, magnetic field, magnetic poles, charged particle in a magnetic field, magnetic field of a wire, magnetism properties of the matter, magnetic field effect of electric current concepts.

A study by Shubha & Meera (2019) Focused on using visual representation in developing conceptual comprehension of magnetic force used simulations to address learning difficulties among students. Initial assessments showed confusion in vector analysis and application of the right-hand rule. Simulations improved reasoning, but gaps remained, suggesting that interactive tools should be supplemented with explicit instruction for optimal learning. McPheron & Khunz (2019) Developed a set of pre-class videos for Electromagnetic Theory which involved 15 pre-class videos for a university-level electromagnetic theory course. Students indicated that the videos enhanced their readiness and learning process. The videos were highly appreciated, and everyone suggested using them. The research highlights the manner in which instruction using video can boost motivation and conceptual preparedness, particularly for difficult physics subjects.

The advancement of technology has opened doors to digital learning, and studies suggest that short-form videos offer potential benefits in improving students' engagement and understanding. Social media platforms like TikTok and YouTube Shorts provide potential for microlearning and the ability to understand complex ideas through bite-sized, visually-oriented content. UNESCO has also recognized the role of technology in STEM education, emphasizing its significance in preparing students for future careers. The Philippine Development Plan (PDP) 2023-2028 aligns with this vision, highlighting the importance of digital transformation in education through the integration of multimedia tools.

While short-form videos are increasingly being used in educational contexts, their use in a learning playlist format for the teaching of magnetic fields in junior high school physics is underutilized. (Haliti-Sylaj & Sadiku, 2024). Previous studies have primarily focused on longer video formats or simulations, with limited research on how short-form videos can be strategically assembled to create a coherent and effective learning experience. This gap in research points to the need for developing and evaluating effective playlists of short-form videos to enhance students' conceptual understanding of magnetic fields.

**Literature Review**

Science teachers understand that students enter the classroom with preconceived misconceptions, which can influence their capacity to learn about science (Patil et al., 2019). Misconceptions, especially in physics topics like magnetism, can be deeply ingrained and resistant to change through traditional instruction (Clement, 2020; Hestenes, 2019). These alternative conceptions interfere with students' capacity to transfer scientific knowledge to novel situations, highlighting the necessity for instructional approaches that proactively confront misconceptions and facilitate meaningful learning (Novak, 2022).

Recent research has explored the use of multimedia resources, including short-form videos, as a tool to enhance conceptual understanding in physics (Richards, 2020). Such videos, particularly when presented in a learning playlist, provide effective methods of visualizing abstract phenomena such as magnetic fields, lowering cognitive load and perhaps enhancing long-term retention (McPheron & Kunz, 2016). However, there is limited research on how different types of short-form content, such as educational vs. entertainment-based videos, affect students' cognitive processes and understanding of scientific concepts. (Haliti-Sylaj & Sadiku, 2024). The current study seeks to investigate the efficacy of short-form videos in a playlist for improving high school students' scientific understanding of magnetic fields in the context of misconceptions as well as deeper learning.

The studies reviewed here point out that technology integration is an important feature of improving teaching physics, particularly at secondary school level. Various kinds of educational technologies, i.e., interactive simulations, ICT tools, Learning Management Systems (LMS), and multimedia applications, have been found to improve students' interest, learning, and critical thinking skills. Studies identify that PhET simulations and other interactive resources are highly effective in understanding abstract topics of physics, i.e., kinematics and modern physics.

However, some barriers to effective technology integration still exist. Research has identified poor teacher training, uneven access to web-based assistance, and institutional barriers as key barriers. (Pelila, et al., 2022) The TPACK model suggests that effective technology integration relies on teachers possessing an appropriate balance of pedagogy, content, and technology. Teacher attitude is also varied while the majority of teachers understand the potential value of digital resources, concerns surrounding time constraints, lack of resources, and lack of professional development opportunities persist. (Adeshina, 2024)

For Gen Z students, who are used to fast-paced digital content, short videos have become a potential study aid. Dunleavy et al. (2022) indicate the potential of the videos to improve students' learning, especially for rapid review and concept reinforcement. TikTok and such websites have become popular because they are capable of presenting content in micro-learning and nano-learning formats (Khlaif & Salha, 2021), presenting complex subjects in bite-sized pieces of information. Syah et al. (2020) also indicate that learning content on TikTok can be produced specifically for young students, presenting an effective means of reaching modern students. Mahmoudi et al. (2024) also indicate that such videos are appropriate for students with shorter attention, a problem in the modern digital learning environment.

Studies have established that micro-lectures and brief videos improve self-learning, retention, and comprehension of abstract concepts. (Mostrady et al., 2024). The accessibility of the videos, particularly their mobile usability and downloadability, allows students to watch content anywhere and at any time. Moreover, TikTok facilitates peer-to-peer communication and sharing of information, promoting innovative learning processes among students. (Genelza, 2024)

One method of increasing student ownership of learning is through actively involving them in lectures, with careful preparation beforehand to ensure discourses are meaningful. Traditionally, students are assigned textbook readings to prepare, but studies indicate that students hardly ever read textbooks prior to attending class, and this inhibits them from participating meaningfully. (Gammerdinger, 2018). One option is to employ video as a medium to present new material prior to class, especially for challenging subjects such as electromagnetic theory. This subject, which is abstract and heavily reliant on multivariable calculus, can be challenging for both senior-level electrical engineers and students in physics courses. (Jadhav, 2022).

Most available videos on electromagnetics are too theoretical or too long, and frequently contain ads, which reduces student engagement.

Although the studies cited showed that short-form videos reduce cognitive load, there is not enough understanding on the mechanisms behind it. (Chiossi, et al., 2023) Further studies can be conducted to look into how different types of these media, including both educational and entertainment, affects the students' cognitive processes. Extensively, the integration of these videos in a blended learning environment must be investigated.

**Research Problems and Hypotheses**

For many Junior High School students, Electromagnetic Theory, particularly Magnetic Field remains both challenging and overwhelming due to the abstract nature of forces. Such concepts that are beyond imagination could be simply made clear through simulations, animations, and interactive visual aids. With the rise of technology, different platforms can be utilized to cater to the complex learning demands of subjects such as Physics.

Along with the evolution of digital media, the way of consuming information has also changed. The emergence of short-form videos on social media platforms like TikTok and Youtube shorts has reshaped learning habits. With shorter attention spans, students gravitate toward bite-sized, engaging content.

The overall question that this study seeks to answer is "How effective are short-form videos when integrated into a learning playlist in enhancing students' engagement and understanding of Magnetic Fields compared to traditional teaching methods?" This question also considers related sub-inquiries such as:

- Do students actively watch and engage with the videos in the playlist?
- Do students perceive an improvement in their academic performance due to the use of the playlist?
- Does the playlist make students feel more ready for class discussions and learning activities?
- Do students find the short-form videos useful as part of their learning process?

Specifically, the study seeks to complete the following objectives.

a. Develop a learning playlist for 5E's with essential questions and topic

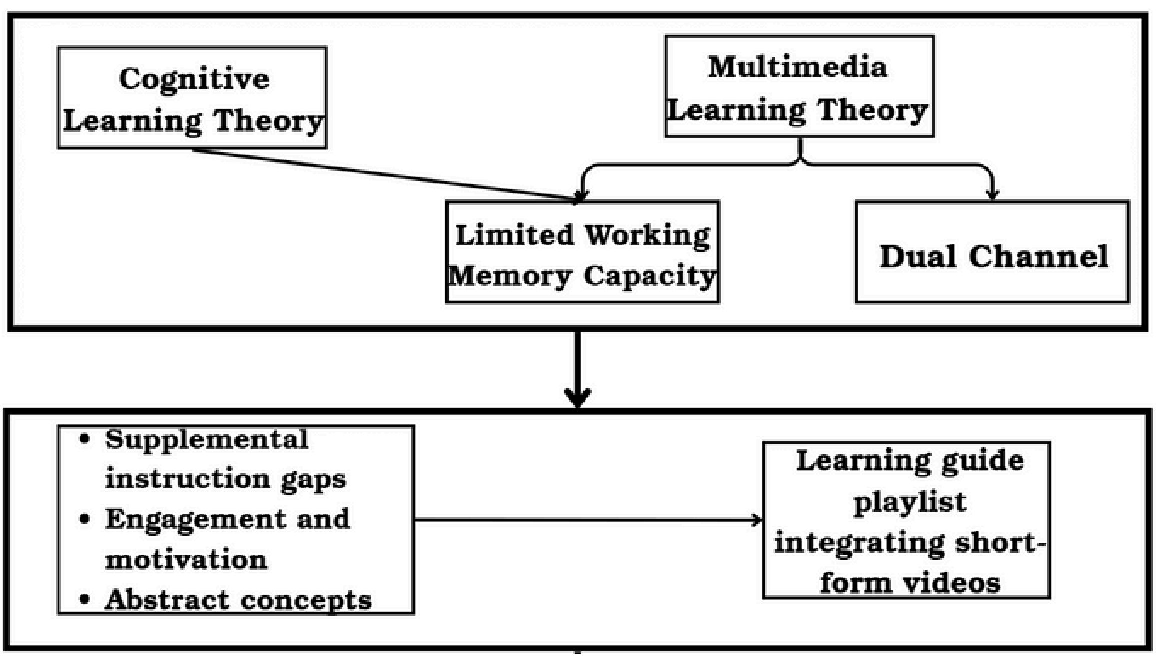
b. Validate the learning playlist by obtaining feedback from at least 3 subject matter experts

**Theoretical and Conceptual Framework**

The conceptual and theoretical framework of the study shows the interaction between cognitive theories, the learning problems identified, the proposed intervention, and the anticipated outcome. Relying on Cognitive Load Theory and Multimedia Learning Theory, the framework acknowledges the fact that students possess limited working memory capacity that influences their processing of complex information. In order to maximize learning.

Multimedia Learning Theory underscores dual-channel processing of visual and auditory information, thus rendering multimedia-based instruction more effective. Acknowledging the needs of supplementary materials, engagement and motivation, and abstract concepts in learning Magnetic Field, the study seeks to create a learning playlist for 5E's along with essential questions and topics. The learning playlist will utilize visualization and information chunking to maximize engagement and understanding and minimize cognitive overload. Lastly, the framework proposes that the use of this multimedia-based learning playlist guide will result in improved science learning, enabling students to understand Magnetic Field through making abstract ideas more understandable and interesting.

***Figure1.*** *Theoretical and Conceptual Framework.*



**Definitions of Terms**

To better understand the study, the following were the terms the researchers had defined operationally and theoretically as fitting to their significance and purpose in the study.

***Cognitive Load*** refers to the total amount of mental effort required by a learner to process, understand, and retain new information. According to Cognitive Load Theory, learning becomes difficult when the demands placed on the working memory exceed its capacity, especially when instructional materials are poorly designed or contain unnecessary information.

***Dual-channel*** is a principle from the Multimedia Learning Theory which states that the human cognitive system processes information through two separate channels: the visual–pictorial channel and the auditory–verbal channel. Effective multimedia instruction distributes information across these channels to reduce overload and enhance understanding.

***Learning gaps*** describe the disparity between a learner’s current knowledge, skills, or understanding and the expected learning competencies for their grade level. These gaps may arise from missed instruction, ineffective teaching strategies, or difficulty grasping abstract concepts such as magnetic fields.

***Magnetic Field*** is an invisible region surrounding a magnet, electric current, or moving charged particle where magnetic forces can be felt. It represents how magnetic interactions occur in space and is typically visualized using field lines that indicate direction and strength.

***PhET Simulations*** are interactive, research-based digital simulations developed by the University of Colorado Boulder. These simulations aim to improve the teaching and learning of science and mathematics by offering virtual environments where learners can explore concepts through manipulation and experimentation.

***Short-form videos*** are brief, fast-paced video clips typically lasting from 15 seconds to 3 minutes. Found on platforms such as TikTok, YouTube Shorts, Instagram Reels, and Facebook, they support microlearning by presenting key ideas quickly, using engaging visuals and simplified explanations.

***Supplementary Material*** are instructional resources used to enhance, expand, or reinforce the primary learning content. These include worksheets, infographics, short-form videos, simulations, or additional readings that deepen understanding or clarify difficult topics.

***Magnetic Field*** is an invisible region surrounding a magnet, electric current, or moving charged particle where magnetic forces can be felt. It represents how magnetic interactions occur in space and is typically visualized using field lines that indicate direction and strength.

***Traditional teaching methods*** refer to teacher-centered approaches such as lectures, textbook reading, note-taking, and written demonstrations. These methods emphasize direct instruction but may limit student engagement and inquiry, especially when teaching abstract physics concepts.

***Working Memory*** is a cognitive system responsible for temporarily holding, organizing, and manipulating information needed for tasks such as learning, reasoning, and problem-solving. It has limited capacity, and instructional materials must be designed carefully to avoid overwhelming this system.

# CHAPTER 2

# METHODOLOGY

This chapter presents the research design and methodology, research site, selection criteria and participants, data collection, role of the researcher, and ethical considerations as used in the study.

## Research Design

The study will follow a Design and Development Research methodology aimed at creating a learning playlist guide for Junior High School Physics Students about Electromagnetic Theory, particularly Magnetic Field. The research will be carried out in 2 phases: learning playlist guide design and development, and validation.

## Participants

The participants of this study is

***Expert Review:*** This phase will obtain feedback from at least 3 subject matter experts in Physics Education. They will assess the learning playlist guide in terms of its content, curriculum alignment, and pedagogy. Feedback from them will be used to refine the learning playlist guide before it is implemented in the chosen physics class.

## Role of Researchers

The role of the researcher is outlined below for each phase of the study.

***Learning Playlist Design and Development:*** The researchers will design and develop the learning playlist guide

***Expert Review:*** The researchers will present the learning playlist guide to at least three subject matter experts for physics. They will consider their feedback in enhancing the learning playlist guide before implementation.

**Research Instrument**

This study will utilize several research instruments to gather data and assess the effectiveness of the learning playlist guide in teaching Magnetic fields. The open response guides will allow for in-depth discussion with the subject matter experts to ensure validity of teaching material. The literature review protocol will also direct the systematic selection and analysis of available studies on short-form videos as learning materials. The learning playlist guide templates will present a systematic outline for content arrangement. A review rubric and a feedback form will be applied to assess the content validity.

**Data Collection**

The data collection process will involve several key steps as follows:

***Design and Development:*** The design and development phase, data extraction will be performed to systematically document and organize literature review findings and the feedback obtained during the writing of the guide. The learning playlist guide development will be guided by a minimum of 20 peer-reviewed articles on the application of short-form videos and multimedia materials. Applicable quotes and main themes of the literature will be documented in a Literature Review Protocol and compiled in a Data Extraction Sheet. This process ensures that the learning guide is evidence-based and grounded on multimedia learning principles.

***Validation:*** Feedback will be gathered from a minimum of three subject matter experts utilizing a structured Review Rubric and Feedback Form. These will enable experts to review the guide's instructional value, accuracy, and clarity. Open response with subject matter experts can also be done to gain further information. The qualitative comments will be content analyzed, while the quantitative scores will assist in identifying the strengths and areas for revision of the learning playlist guide.

**Potential Ethical Issue**

In compliance with the research ethics, guidelines will strictly be followed throughout the study. Informed consent will be given to subject matter experts before proceeding with the expert feedback of the learning playlist guide.

Confidentiality will be considered by giving anonymity to student and expert feedback. All participants will be informed of the benefits, risks, purpose, and the overall procedure of this research. Additionally, the participants will have a right to withdraw from the study at any time without any consequence.

The researchers will adhere to intellectual property rights by ensuring that all sources, including ideas, data, and content, are acknowledged and cited.

**Risk Analysis**

In conducting this study, several ethical, methodological, and data-related risks were carefully identified and addressed to ensure the integrity and validity of the research process. From an ethical perspective, there was a moderate possibility that the subject-matter experts (SMEs) might misinterpret the evaluation criteria or provide feedback that varied widely. To manage this, the researchers clarified instructions, organized feedback systematically, and applied triangulation to reconcile differing comments. Another ethical concern involved maintaining the confidentiality of the SMEs during validation; although the likelihood of a breach was low, its potential impact was significant. Thus, informed consent was secured, and all feedback was anonymized.

Methodologically, certain limitations posed moderate to high risks. Because the playlist was developed without actual student implementation, there was a high possibility that the effectiveness of the material in real classroom settings could not be directly measured. To address this, the study explicitly positions itself as material development and expert validation research, recommending future classroom testing. Additionally, selecting short-form videos introduced the risk of researcher bias. This was mitigated by applying strict selection criteria guided by Multimedia Learning Theory and Cognitive Load Theory, such as video duration under two minutes, conceptual accuracy, clarity of visuals, and low cognitive load. The limited number of SMEs also presented a moderate risk to generalizability, which was managed by ensuring all experts possessed strong qualifications relevant to physics or science education.

Regarding data handling, inconsistencies in SME ratings presented a moderate methodological risk. To minimize this, the researchers planned to compute inter-rater reliability measures. Potential loss of digital files including the playlist, evaluation forms, and video links, posed a low but high-impact risk, which was mitigated through regular cloud backups and version control.

In terms of the learning playlist as supplementary material, several pedagogical, technical, and learner-related risks were also considered. Pedagogically, short-form videos could oversimplify abstract concepts related to magnetic fields or encourage students to depend solely on videos rather than engaging in deeper inquiry. These risks were mitigated by incorporating processing questions and pairing videos with teacher-facilitated discussions. Technologically, unreliable internet access posed a high risk, particularly during classroom implementation, while the possibility of “dead links” due to removed or restricted videos remained moderate. Both issues were addressed by preparing downloadable backups

# CHAPTER 3

# RESULTS AND DISCUSSIONS

## A. Video Screening and Selection Process

To guide the selection process of the videos, a systematic screening process was employed in order to ensure that the playlist will be pedagogical and appropriate in teaching magnetic fields. The videos gathered from different streaming platforms were evaluated using a checkpoint system where each video had to pass a series of filters. The following tables present the results of this screening process.

***Table 1.1:*** *Ordered Checkpoint System*

| Checkpoint | Guiding Question |
|---|---|
| Content Accuracy | Does the Video present scientifically correct information about magnetism or magnetic fields? |
| Curriculum Relevance | Does the video address a concept needed for the 5e lesson sequence? |
| Cognitive Load | Is the video free from distracting edits, clutter, and unrelated content? |
| Clarity & Visual Quality | Are the visuals and audio clear enough for the students to understand? |
| Multimedia Principle | Does the video use clear visuals with proper timing, and minimal text? |
| Length & Pace | Is the video short, focused, and paced reasonably(not too fast, not overwhelming/ under 3 mins)? |
| 5E Classification | Can the video clearly fit into one 5E phase? |
| Duplicate/Redundancy content | Does this video offer something unique compared to other selected videos? |

***Table 1.2:*** *Videos from different platforms*

| Video Links | | Remarks |
|---|---|---|
| 1 | 19.1 Introduction to Magnetic Fiel… | Scientifically accurate and well explained, with clear visuals for students. Useful for engaging and explaining,though its length may make it heavy for initial introduction. |
| 2 | Current & Magnetic Fields \| Magn… | Content is accurate and curriculum-relevant with helpful animations, but length and moderate cognitive load makes it best for Explain rather than quick class use. |
| 3 | Magnetism and Electromagnetism … | Solid explanation of magnets and electromagnetism with clear visuals and minimal distractions; fits Explain/Explore, but >2 mins may challenge student attention span. |
| 4 | Magnetism, Magnetic Field Force,… | Thorough and accurate coverage including equations and problem-solving, appropriate for Explain or Evaluate, but long and somewhat dense, which could be challenging for working memory. |
| 5 | How do Magnets & Magnetic Fiel… | Clear, accurate, and well-paced introduction to magnetic fields; good for Explain, though being longer than 3 minutes may make it less ideal for quick review. |
| 6 | Magnetic Field and Magnetic Fiel… | Visually clear demonstration of field lines and conceptually correct, suitable for Explore, but its greater than 3-minute length may reduce engagement at first glance. |
| 7 | Magnetism: Crash Course Physics … | Broad but correct overview with engaging visuals, useful for Engage, though the pace and duration may be fast for some students. |
| 8 | Magnetism \| The Dr. Binocs Show… | Accurate and well-structured, with clear explanations and visuals; fits the Explain phase nicely, 3 minutes. |
| 9 | Intro to Electric Fields & Magneti… | Good conceptual clarity linking electric and magnetic fields, useful for Explain, but the video's length and amount of content may overwhelm some learners. |
| 10 | Magnetism and Magnetic Field in … | Visually clean and conceptually accurate for Explore, with length longer than 2 minutes. |
| 11 | All of MAGNETIC FIELDS in 15… | Concise overview of magnetic field phenomena but still greater than 3mins and somewhat fast-paced, making it borderline between Engage and Explain. |
| 12 | Magnetic Fields – Observing Mag… | Clear and accurate step-by-step explanation suited for Explain, though the video is longer than 2 minutes. |

| | | |
|---|---|---|
| 13 | What is a Magnetic Field? (Electr… | Accurate conceptual coverage and clear visuals appropriate for Explore, but exceeds 2 minutes. |
| 14 | All About Magnets | Accurate and visually clear overview suitable for the Explain phase, though video length exceeds 2 minutes which might make it dense for quick lessons. |
| 15 | Magnets and Magnetic Fields | Accurate and well-structured for Explain, though the long duration may increase cognitive load. |
| 16 | GCSE Physics - What Are Magnet… | Clear and accurate overview useful for Engage, but exceeds 2 minutes. |
| 17 | Earth's Magnetic Field: The Invisible Force That Protects Us - YouTube | Quick and accurate demonstration of magnetic field behavior, suitable for Engage or Explore with low cognitive load. |
| 18 | Magnetic Field Lines - YouTube | Clear and accurate quick demo suitable for Engage with low cognitive load. |
| 19 | https://www.youtube.com/shorts/qjk0mFmtsmE?feature=share | Accurate bar-magnet field visualization ideal for Explore and very clear. |
| 20 | Magnetic attraction and repulsion 🧲 \|\| Magnetic Energy into 💪 Energy #scienceandfun #short - YouTube | Simple and accurate magnetic demonstration suited for Engage, with clean visuals and focused pace. |
| 21 | Sun vs Earth's Magnetic Field 🚀 🌌 #Space #shorts - YouTube | Accurate and visually simple, good for the Engage phase. |
| 22 | Magnetic field lines around a bar Magnet - YouTube | Offers a unique magnetic effect demonstration, useful for Explore, with clear visuals and minimal cognitive load. |
| 23 | Magnetic Fields & How They Work \| The Science of Magnetism #shorts #magnets #magnet - YouTube | Clear and simple magnetism demo suitable for Engage, though content is basic and somewhat redundant. |
| 24 | Dent in Earth's Magnetic Field \| COSMOS in a minute #35 - YouTube | Clear magnetic field visualization suited for Explore, though appears similar to the next duplicate. |
| 25 | How A Magnet Works 🤔 - YouTube | Accurate short demo ideal for Engage with strong visual clarity. |
| 26 | 😱 Have you ever seen magnetic field lines? \|\| magnetic poles #magnet #physics - YouTube | Engaging, accurate, and well-paced short demo, ideal for Engage. |
| 27 | MAGNETIC FIELD OF A BAR MAGNET #physics #trending - YouTube | Clear illustration of magnetic poles ideal for Explore. |
| 28 | Why Earth has a magnetic field 🧲 - YouTube | Accurate and clean magnetic demonstration suitable for Engage, with low cognitive load. |

| | | |
|---|---|---|
| 28 | Why Earth has a magnetic field 🧲 - YouTube | Accurate and clean magnetic demonstration suitable for Engage, with low cognitive load. |
| 29 | Magnetic Fields #electromagnetism - YouTube | Shows a unique demo clearly, useful in Engage or Explore. |
| 30 | Magnetic Forces - Attract and Repel - YouTube | Short, clear, and accurate; appropriate for Engage. |
| 31 | How Do Magnets Work - YouTube | Effective magnetic attraction demo, clear and simple, suitable for Explore. |
| 32 | https://www.instagram.com/reel/DRXVygQjxAu/?utm_source=ig_web_copy_link&igsh=NTc4MTIwNjQ2YQ== | Visually appealing and accurate demonstration, useful for Engage, though lacks depth for deeper conceptual work. |
| 33 | https://www.instagram.com/reel/DRZBfECDKSF/?utm_source=ig_web_copy_link&igsh=NTc4MTIwNjQ2YQ== | Clear magnetic effect demonstration suitable for Engage, but too brief for full conceptual explanation. |
| 34 | https://www.instagram.com/reel/DRXn1WlFhXl/?utm_source=ig_web_copy_link&igsh=NTc4MTIwNjQ2YQ== | Accurately shows magnetic repulsion, good for Explore, though limited in depth. |
| 35 | https://www.instagram.com/reel/DFyMlIBMA4i/?utm_source=ig_web_copy_link&igsh=NTc4MTIwNjQ2YQ== | Offers a slightly more advanced magnetic experiment, fitting for Elaborate, but may be challenging due to complexity. |
| 36 | https://vt.tiktok.com/ZSfVPdC1f/ | Engaging and scientifically correct, suitable for Engage, though may be too informal for structured lessons. |
| 37 | https://vt.tiktok.com/ZSfVfwrD3/ | Clear, quick demonstration of magnetism, useful for Explore, though very basic. |
| 38 | https://vt.tiktok.com/ZSfVPFpDx/ | Interesting magnetic interaction shown clearly, good for Engage, but content is limited. |
| 39 | https://vt.tiktok.com/ZSfVfvoy4/ | Accurate and visually clean; fine for Explore or quick recap. |
| 40 | https://vt.tiktok.com/ZSfVPYJQw/ | Clear and accurate but repeated later, fitting Engage. |
| 41 | https://vt.tiktok.com/ZSfVPLGPS/ | Duplicate content, offering no added instructional |

***Table 1.3:*** *Short-form video selection matrix*

| Video link no. | Accuracy | Relevance | Load | Quality | Multimedia | Pace/ Length | 5Es Fit | Redundancy | Final Result |
|---|---|---|---|---|---|---|---|---|---|
| **1** | | | | | | | | | Rejected |
| **2** | | | | | | | | | Rejected |
| **3** | | | | | | | | | Rejected |
| **4** | | | | | | | | | Rejected |
| **5** | | | | | | | | | Rejected |
| **6** | | | | | | | | | Rejected |
| **7** | | | | | | | | | Rejected |
| **8** | | | | | | | | | **Accepted** |
| **9** | | | | | | | | | Rejected |
| **10** | | | | | | | | | Rejected |
| **11** | | | | | | | | | Rejected |
| **12** | | | | | | | | | Rejected |
| **13** | | | | | | | | | Rejected |
| **14** | | | | | | | | | Rejected |
| **15** | | | | | | | | | Rejected |
| **16** | | | | | | | | | Rejected |
| **17** | | | | | | | | | **Accepted** |
| **18** | | | | | | | | | Rejected |
| **19** | | | | | | | | | Rejected |
| **20** | | | | | | | | | **Accepted** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **21** | | | | | | | | | Rejected |
| **22** | | | | | | | | | **Accept-ed** |
| **23** | | | | | | | | | Rejected |
| **24** | | | | | | | | | Rejected |
| **25** | | | | | | | | | **Accept-ed** |
| **26** | | | | | | | | | **Accept-ed** |
| **27** | | | | | | | | | Rejected |
| **28** | | | | | | | | | **Accept-ed** |
| **29** | | | | | | | | | Rejected |
| **30** | | | | | | | | | **Accept-ed** |
| **31** | | | | | | | | | **Accept-ed** |
| **32** | | | | | | | | | Rejected |
| **33** | | | | | | | | | Rejected |
| **34** | | | | | | | | | Rejected |
| **35** | | | | | | | | | Rejected |
| **36** | | | | | | | | | Rejected |
| **37** | | | | | | | | | Rejected |
| **38** | | | | | | | | | Rejected |
| **39** | | | | | | | | | Rejected |
| **40** | | | | | | | | | Rejected |
| **41** | | | | | | | | | Rejected |
| **42** | | | | | | | | | Rejected |

**B. Clean datasets**

***Table 2.1:*** *Means per criterion*

| ITEM | MEAN | VI | SD |
|---|---|---|---|
| *I. Content Quality* | | | |
| 1. The concepts are scientifically correct and are aligned with the SHS General Physics curriculum. | 3.67 | Very Satisfactory | 0.58 |
| 2. Concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives. | 3.67 | Very Satisfactory | 0.58 |
| 3. The factual information presented (e.g., visuals, on-screen text, narration, and demonstrations) is precise and error-free. | 3 | Satisfactory | 0 |
| 4. Content is up to date. | 4 | Very Satisfactory | 0 |
| 5. Content is logically developed and organized. | 3.33 | Satisfactory | 0.58 |
| 6. Content is free from cultural, gender, racial, or ethnic bias. | 3.67 | Satisfactory | 0.58 |
| 7. Content stimulates and promotes critical thinking. | 3 | Satisfactory | 0 |
| 8. Content is relevant to real life situations. | 3.67 | Very Satisfactory | 0.58 |
| 9. Language (including vocabulary) is appropriate to the target user level. | 3.33 | Satisfactory | 1.15 |
| 10. Content promotes positive values that support formative growth. | 3.67 | Very Satisfactory | 0.57 |

| | | | |
|---|---|---|---|
| *II. Technical Quality* | | | |
| 11. Audio enhances understanding of the concept. | 2.67 | Satisfactory | 1.15 |
| 12. Speech and narration (correct pacing, intonation, and pronunciation) is clear and can be easily understood. | 3.33 | Satisfactory | 0.58 |
| 13. There is complete synchronization of audio with the visuals, if any. | 4 | Very Satisfactory | 0 |
| 14. Music and sound effects are appropriate and effective for instructional purposes. | 3 | Satisfactory | 1 |
| 15. Screen displays (text) are uncluttered, easy to read, and aesthetically pleasing. | 2.67 | Satisfactory | 0.58 |
| 16. Visual presentations (non-text) are clear and easy to interpret. | 4 | Very Satisfactory | 0 |
| 17. Visuals sustain interest and do not distract the user's attention. | 4 | Very Satisfactory | 0 |
| 18. Visuals provide accurate representation of the concept discussed. | 3.33 | Satisfactory | 0.58 |
| 19. The design allows the target user to move freely and intuitively through the material (e.g., clear buttons, organized layout, and responsive links). | 2.67 | Satisfactory | 1.15 |
| 20. The material is self-explanatory and can be effectively used by the target user without teacher assistance (e.g., clear instructions, logical flow, and clear and easy-to-understand language (with explanations for unfamiliar terms]. | 4 | Very Satisfactory | 0 |

***Table 2.2:*** *Domain Averages*

| Domain | Mean | VI |
|---|---|---|
| Content Quality | 3.5 | Very Satisfactory |
| Technical Quality | 3.36 | Satisfactory |

**C. Development of Research Instrument**

The researchers used the descriptive research design utilizing the adopted and modified questionnaire from Calatrava (2022) to determine the acceptability of the developed learning playlist in terms of content and technical quality.

The study contains a rubric using a 4-point Likert scale as a research instrument. The scale is as follows:

1 = Not Satisfactory

2 = Fairly Satisfactory

3 = Satisfactory

4 = Very Satisfactory

The questionnaire comprised 10 questions each for content and technical quality. The learning playlist demonstrates high content quality, having a mean of 3.53 (Very Satisfactory). The key strengths highlighted are its timeliness and content relevance (Items 1, 2, 4, 8, 10) with a mean greater than 3.67. On the other hand, two areas, the precision of factual information and promotion of critical thinking, scored lower with a mean = 3.00. This indicates a need for an incorporation of higher-order thinking prompts on the material. The technical quality of the material scored an overall mean of 3.37 (Satisfactory). It pinpoints that the playlist excels in audiovisual synchronization, clarity of non-text visuals, engagement, and self-directed usability. However, primary areas for improvement are audio clarity and on-screen text designs.

**D. Statistical Treatment of Data**

Three physics educators were consulted to validate the learning playlist using the questionnaire. To determine the content validity of the items in the questionnaire, Aiken's V was computed. Aiken's V measures the agreement among the respondents regarding the appropriateness of each item on the rubric. The coefficient was calculated using Aiken's Formula (1985), wherein each rating is converted into a proportional score based on the distance from the lowest rating from the scale. The values computed were interpreted using the established criteria, where coefficients near 1.0 are considered high content validity.

**E. Results of Item Validities Using Aiken's V**

***Table 3.1:*** *Aiken V Coefficients on Content Quality construct of the instrument*

| Item | R1 | R2 | R3 | s1 | s2 | s3 | $\Sigma s$ | n(c-1) | V |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 4 | 3 | 3 | 3 | 2 | 8 | 9 | 0.89 |
| 2 | 4 | 4 | 3 | 3 | 3 | 2 | 8 | 9 | 0.89 |
| 3 | 3 | 3 | 3 | 2 | 2 | 2 | 6 | 9 | 0.67 |
| 4 | 4 | 4 | 4 | 3 | 3 | 3 | 9 | 9 | 1 |
| 5 | 4 | 3 | 3 | 3 | 2 | 2 | 7 | 9 | 0.78 |
| 6 | 4 | 3 | 4 | 3 | 2 | 3 | 8 | 9 | 0.89 |
| 7 | 3 | 3 | 3 | 2 | 2 | 2 | 6 | 9 | 0.67 |
| 8 | 4 | 4 | 3 | 3 | 3 | 2 | 8 | 9 | 0.89 |
| 9 | 4 | 4 | 2 | 3 | 3 | 1 | 7 | 9 | 0.78 |
| 10 | 3 | 4 | 4 | 2 | 3 | 3 | 8 | 9 | 0.89 |

***Table 3.2:*** *Aiken V Coefficients on Technical Quality construct of the instrument*

| Item | R1 | R 2 | R3 | s1 | s2 | s3 | Σs | n(c-1) | V |
|---|---|---|---|---|---|---|---|---|---|
| **11** | 4 | 2 | 2 | 3 | 3 | 1 | 7 | 9 | 0.78 |
| **12** | 4 | 3 | 3 | 3 | 2 | 2 | 7 | 9 | 0.78 |
| **13** | 4 | 4 | 4 | 3 | 3 | 3 | 9 | 9 | 1 |
| **14** | 4 | 3 | 2 | 3 | 2 | 1 | 6 | 9 | 0.67 |
| **15** | 3 | 3 | 2 | 3 | 2 | 1 | 6 | 9 | 0.67 |
| **16** | 4 | 4 | 4 | 3 | 3 | 3 | 9 | 9 | 1 |
| **17** | 4 | 4 | 4 | 3 | 3 | 3 | 9 | 9 | 1 |
| **18** | 3 | 4 | 3 | 2 | 3 | 2 | 7 | 9 | 0.78 |
| **19** | 4 | 2 | 2 | 3 | 3 | 1 | 7 | 9 | 0.78 |
| **20** | 4 | 4 | 4 | 3 | 3 | 3 | 9 | 9 | 1 |

**F. Content and Technical Validity Assessment using Aiken's V**

This study utilized Aiken's Content Validation Index to ensure the validity of the learning playlist, in terms of content and technical quality. Three expert validators, all physics educators, evaluated the relevance of each item using a 4-point Likert scale, wherein 1 indicated "Not satisfactory" and 4, as the highest rating, indicated "Very satisfactory." The degree of agreement among the respondents was measured using Aiken's V, which provides a quantifiable measure of the consistency on how the experts rated each item. The formula used to calculate the index is:

$$V = \frac{\sum s}{n(c-1)}$$

where s represents the difference between the experts' rating and the lowest possible score, n is the number of validators, and c is the total number of rating categories. The resulting values will range from 0 to 1.

According to Villanueva and Caalim (2024), items with values approaching or exceeding 0.80 index are considered highly valid. V between 0.70 and 0.79 are considered moderate and below 0.70 implies poor validity.

***Table 3.3:*** *Results of Content Validity Assessment using Aiken's V*

| Item (Content Quality) | Aiken's V | Interpretation |
|---|---|---|
| **1** | 0.89 | Highly valid |
| **2** | 0.89 | *Highly valid* |
| **3** | 0.67 | *Poor validity* |
| **4** | 1 | *Highly valid* |
| **5** | 0.78 | *Moderate validity* |
| **6** | 0.89 | *Highly valid* |
| **7** | 0.67 | *Poor validity* |
| **8** | 0.89 | *Highly valid* |
| **9** | 0.78 | *Moderate validity* |
| **10** | 0.89 | *Highly valid* |

The results presented in table 4 indicate that the learning playlist has an overall strong content validity. It has clear strengths and areas for improvement are identifiable. Most of the criteria,7 out of 10, were rated as high or moderate validity. Six items received an index of 0.89 or higher. This demonstrates to a strong expert that the magnetic field learning playlist is appropriate for several critical areas including scientific accuracy, relevance to real life situations, and timeliness.

Two criteria were interpreted as moderately valid. Item 5 and Item 9 scored a 0.79. These suggests that the flow of the playlist and the complex language of the videos collected could be slightly refined. The short videos, having a segmented nature, might have led the validators to question the cohesiveness of the playlist.

Two items were identified with an index lower than 0.70. Item 3, being poorly valid, necessitates a more meticulous review of all videos to ensure the precision of information delivery. This could involve errors in on-screen texts, narration, or the material itself. The short-form format, while engaging, might prioritize explanation over asking questions. Item 7's lower score suggests that the videos need to address active engagement in higher-order thinking. The videos may benefit from pause-and-predict prompts or short challenges to direct students into concept application.

***Table 3.4:*** *Results of Technical Validity Assessment using Aiken's V*

| Item (Content Quality) | Aiken's V | Interpretation |
|---|---|---|
| **11** | 0.78 | *Moderate validity* |
| **12** | 0.78 | *Moderate validity* |
| **13** | 1 | *Highly valid* |
| **14** | 0.67 | *Poor validity* |
| **15** | 0.67 | *Poor validity* |

| | | |
|---|---|---|
| **16** | 1 | *Highly valid* |
| **17** | 1 | *Highly valid* |
| **18** | 0.78 | *Moderate validity* |
| **19** | 0.78 | *Moderate validity* |
| **20** | 1 | *Highly valid* |

The Aiken's V results presented in Table 5 reveal that the learning playlist demonstrates excellence in audiovisual presentation but has identified room for improvement in key areas of design and visual clarity.

The playlist received a high score (V=1.00) in Item 20. This shows the crucial strength of the material in terms of functioning effectively as an independent learning tool without teacher guidance. The material may be appropriate as a resource designed for flexible and self-paced learning.

The playlist achieved an index of 1 on "Synchronization of audio with visuals", "clarity of visual presentations", and "visuals sustain interest and do not distract." This indicates unanimous agreement among validators that the sound and visuals were integrated seamlessly. It is a major asset that meets the expectations that the short-form video fosters high-engagement and sustained attention.

Several criteria fell into the moderately valid category, suggesting that they are functional but have room for improvement (Item 11,12,18,19). This implies that despite the appropriate visuals and clear audio, there may be inconsistencies in terms of narration in terms of pacing in some segments. Additionally, the layout for navigating between the videos could be slightly confusing. These areas need refinement to elevate the experience of the learners.

Two items were identified with poor validity (Item 14, 15) pointing out technical flaws of the material. The choice of music or sound effects on some videos may be inappropriate or simply mismatched with the tone of the content. In terms of aesthetics, the results also point out that the text displayed on some videos is difficult to read or unpleasant.

**G. Visualizations**

**Figure 2.1:** ***Aiken's V Coefficients on Content Validity***

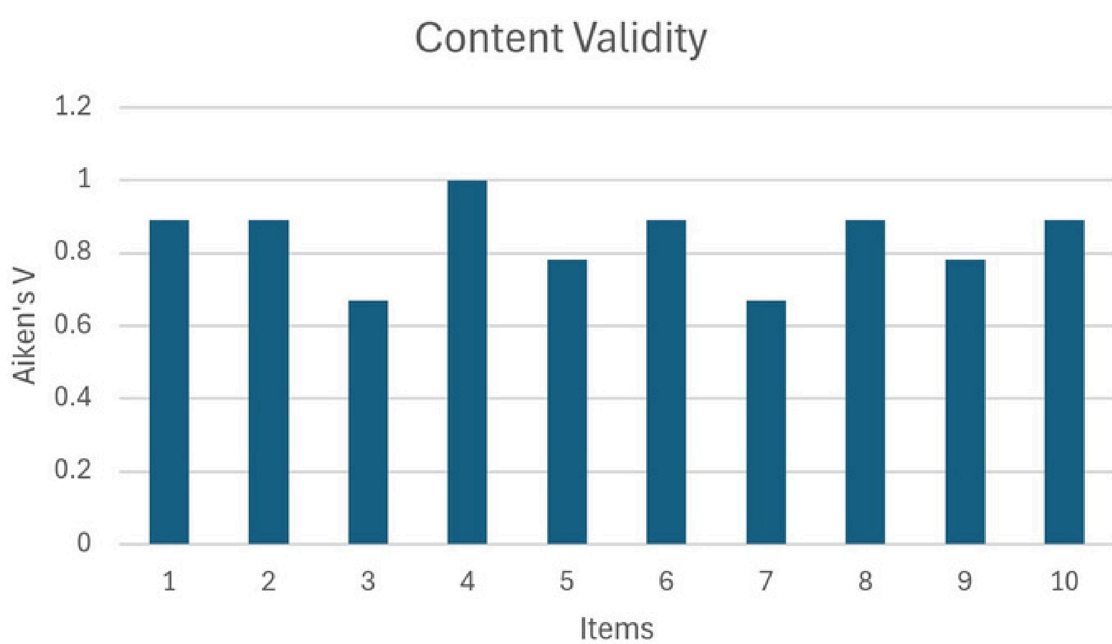
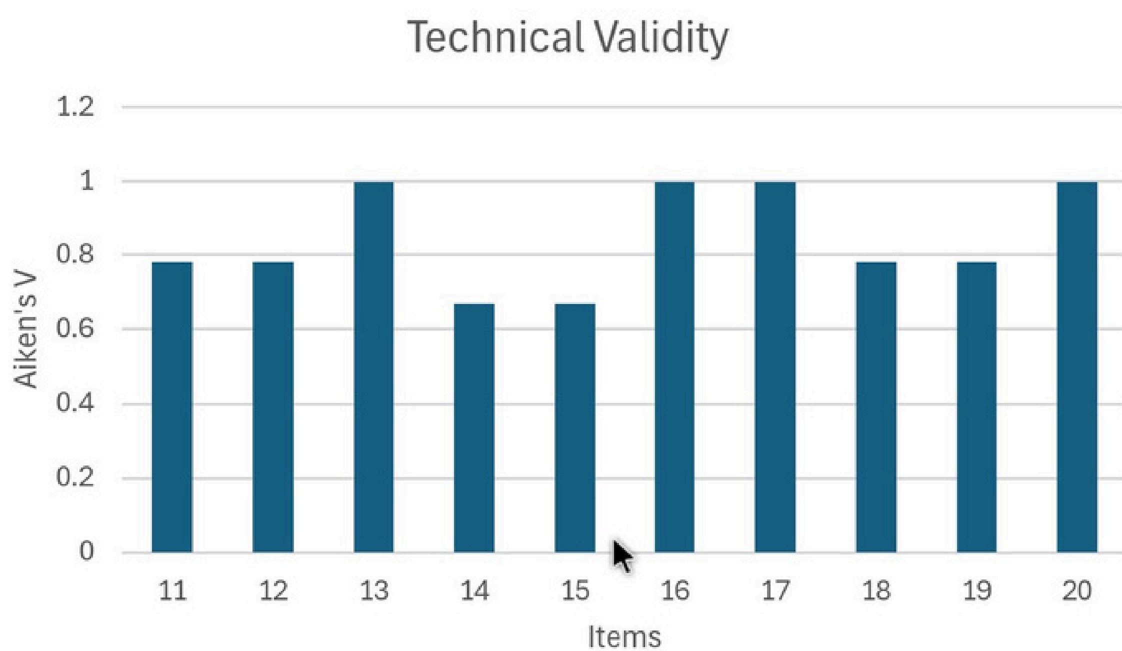


**Figure 2.2:** ***Aiken's V Coefficients on Technical Validity***



# CHAPTER 4

## NARRATIVE OF RESULTS AND DISCUSSIONS SECTION

### Theme 1: Learning Playlist for 5Es

The results revealed that the development of the short-form video learning playlist successfully aligned with the structure and cognitive intentions of the 5E Instructional Model. Engage, Explore, Explain, Elaborate, and Evaluate. For each phase, the researchers selected videos that were not only thematically appropriate but also consistent with principles of multimedia learning. The final playlist demonstrated coherence across phases: the Engage videos captured attention through visually striking demonstrations of magnetic attraction; the Explore videos presented observable phenomena such as iron filing patterns; the Explain videos provided structured and accurate explanations; and the Elaborate videos contextualized magnetism in real-world applications.

The playlist reflected clear adherence to the criteria set at the beginning of the selection process. All videos were short, mostly under two minutes, supported accurate physics content, and demonstrated low cognitive load. These characteristics align with Mayer's (2005) Multimedia Learning Theory, particularly the principles of coherence, signaling, and dual-channel processing, which recommend using simplified visuals and step-by-step narration to facilitate learning. Similarly, the short duration helped ensure that extraneous cognitive load was minimized, supporting Sweller's Cognitive Load Theory (Sweller, 1988) Overall, the findings show that a curated playlist when grounded in cognitive theories can systematically support the learning progression intended by the 5Es model, even without direct classroom implementation.

From the development process, the researchers inferred that short-form videos can effectively scaffold conceptual learning when they are carefully aligned with instructional phases. While short-form content is often associated with entertainment, emerging studies show that Gen Z learners engage deeply with fast-paced, visually rich content when used for academic purposes (Admin & Admin, 2025). This supports the researchers' observation that short videos, when intentionally selected, can play an instructional role beyond mere attention-grabbing.

The researchers also noted that the clarity and simplicity of the videos were critical in supporting comprehension of abstract concepts such as magnetic fields. This reinforces Mayer's (2005) assertion that reducing unnecessary details supports learners' working memory. For example, the Explain-phase videos that utilized diagrams and narration exemplified effective dual-channel processing, enabling learners to build mental models of magnetic field lines.

Moreover, the insights gained highlight the value of multimedia for addressing potential learning gaps. Literature shows that magnetism is a topic where misconceptions persist, particularly regarding field lines, poles, and invisible forces (Manjula & Suresh, 2025). The playlist directly targeted these misconceptions by progressively building understanding from simple demonstrations to more explicit explanations. Thus, the researchers inferred that purposefully chosen short-form videos may reduce cognitive overload, sustain learner motivation, and strengthen conceptual understanding, consistent with the theories supporting microlearning and multimedia instruction.

During the development of the playlist, the researchers reflected on how the process required balancing scientific accuracy, pedagogical purpose, and cognitive demands on learners. While selecting videos, the team realized that not all visually appealing videos were instructionally appropriate, many lacked clear explanations, were redundant, or introduced unnecessary details. This challenged the researchers to apply theoretical frameworks actively rather than superficially. Another reflection centered on how difficult it was to find videos that matched the exact intention of each 5E phase. The researchers experienced first-hand that the Engage phase required curiosity-driven media, while the Explain and Elaborate phases demanded structured content. This strengthened their understanding of the 5E model as a guide not just for lesson planning but also for media curation. The process also highlighted the responsibility educators have in selecting digital materials. Even though short-form videos are highly accessible, relying on them without careful evaluation may risk reinforcing misconceptions.

The findings suggest several important implications for science teaching and instructional material development. First, the success of the playlist demonstrates that short-form videos can serve as effective supplementary materials when they are aligned with cognitive principles and instructional frameworks. As microlearning studies indicate, brief videos improve engagement and retention when used strategically (Admin & Admin, 2025). This implies that teachers may integrate short-form content into classroom lessons without compromising depth, provided that they contextualize the videos with reflective questions and guided discussions. The playlist reinforces the importance of reducing cognitive load in teaching abstract physics concepts. Since students often struggle with invisible forces and symbolic representations, videos that break down visuals into simplified, sequential steps can enhance comprehension (Mayer, 2005). Teachers, therefore, should consider multimedia clarity and pacing when selecting digital resources. The implications extend to curricular design. The 5E-aligned playlist can model how science concepts from engagement to application can be built using multimedia scaffolds. This aligns with pedagogical recommendations that emphasize multimodal learning and inquiry-based exploration (Manjula & Suresh, 2025). Finally, the study underscores the need for continuous teacher training in media literacy. As digital platforms become more embedded in student learning, teachers must be equipped to evaluate content accuracy, manage cognitive load, and facilitate meaningful learning experiences.

**Theme 2: Validation of the Learning Playlist for 5Es**

The validation of the learning playlist reveals a strong foundation with room for growth. The high scores in content relevance and audiovisual quality confirm the short-form video platforms' strength in driving learning in an engaging modern format. This is in line with the principles of multimedia learning (Mayer,2005) wherein visuals and relevance effectively reduces cognitive load.

However, the moderate performance of the tool in stimulating critical thinking suggest that it facilitates passive consumption rather than active knowledge construction. Without a redesign, the resource risks underutilization of its potential in developing higher-order thinking skills (Brame, 2016).

Furthermore, the learning playlist is a valid and promising tool in teaching magnetic fields. Its core content is appropriate, and its score in key areas is high. The tool's validity as a self-directed learning resource implies that it can be utilized in flipped classrooms, remedial work, or self-paced learning. However, teachers must be aware of its limitations and should be prepared to do follow-up activities should they integrate the resource to target the critical thinking skills that the videos may not foster. Using the playlist as a springboard for introducing the concept of magnetism, they position themselves as a facilitator of an even deeper learning (Bergmann and Sam's, 2012).

This study aimed to develop and validate a short-form video learning playlist on Magnetic Fields using the 5E Instructional Model as a supplementary learning material for Junior High School Physics. Guided by Multimedia Learning Theory and Cognitive Load Theory, the researchers curated short-form videos based on accuracy, clarity, low cognitive load, and alignment with each phase of the 5Es. The development process revealed that short-form videos, when intentionally selected and pedagogically structured, can effectively support conceptual understanding of magnetic fields. An abstract topic where misconceptions are common.

Although SME validation was conducted under time constraints, the feedback gathered still provided meaningful insights on the clarity, structure, and appropriateness of the playlist. The overall process demonstrated that multimedia-based supplementary materials can be systematically designed even without direct student implementation, as long as they undergo expert review. The learning playlist stands as a functional prototype that can be integrated into classroom instruction and tested further in future studies.

The findings highlight the potential of short-form videos to enhance instructional delivery when used as part of a structured learning sequence. For physics teachers, particularly those handling abstract topics like magnetism, concise videos can serve as cognitive scaffolds that simplify complex ideas (Mayer, 2005). The playlist demonstrates that media can be used not only for engagement but also for guided exploration and explanation, supporting a more active and inquiry-based classroom environment.

The study reinforces the importance of aligning multimedia resources with cognitive theories. Materials designed with attention to coherence, dual-channel processing, and intrinsic load reduction are more likely to support effective learning (Sweller, 1988). The playlist also models how the 5E framework can structure media selection to ensure conceptual progression rather than random video consumption. This offers a replicable approach for developing similar playlists across other science topics.

As digital media becomes increasingly integrated into classroom practices, this study highlights the necessity of equipping teachers with skills in multimedia evaluation and curation. The playlist serves as evidence that short-form videos, when grounded in pedagogy, can supplement curriculum standards and help bridge learning gaps. It also suggests that microlearning strategies may be beneficial for Gen Z learners who thrive in fast-paced, visually driven environments (Admin & Admin, 2025; Manjula & Suresh, 2025).

## Recommendations

### *Recommendations for Teachers*

1. Use short-form videos as supplementary, not standalone, learning tools by pairing them with processing questions and follow-up discussions.
2. Evaluating videos using cognitive load principles favor concise, accurate, and focused multimedia content.
3. Integrate short-form videos within structured inquiry frameworks such as the 5Es to ensure conceptual progression.

### *Recommendations for Future Researchers*

1. Conduct classroom implementation or quasi-experimental studies to measure actual student learning outcomes and retention.
2. Expand the playlist to include differentiated versions for varied learning paces and abilities.
3. Investigate how different types of short-form videos (educational vs. entertainment-styled) affect cognitive processing in physics learning.
4. Replicate the development of learning playlists in other STEM subjects to test the adaptability of the short-form video playlist as a learning tool.

***Recommendations for Material Development and Curriculum Planning***

1. Encourage the creation of more locally contextualized short-form science videos that align with the MATATAG curriculum.
2. Provide teacher training on multimedia literacy and responsible curation of digital content.
3. Integrate microlearning strategies into lesson plans, especially for abstract, misconception-prone topics like magnetism.

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## APPENDIX A

## GANTT CHART

| Objectives | Target Activities | Target Accomplishments | Schedule |
|---|---|---|---|
| Develop a learning guide that includes guide questions, processing discussion, and short-form videos | 1. Developing the learning guide.<br>2. Creating the feedback form | • 1 draft of the learning for revisions and improvement<br>• 1 learning guide complete with contents and incorporated short-form videos | Week 1-6 |

| | | | |
|---|---|---|---|
| Validate the learning guides by obtaining feedback from at least 3 subject matter experts | 1. Creating the review rubric and feedback form<br>2. Presenting the learning guide to the subject matter experts<br>3. Collecting the feedbacks for analysis and revision | Obtain 3 feedback from 3 subject matter experts | Week 7-12 |

## APPENDIX B

## BUDGET

| EXPENSES | TOTAL COST |
|---|---|
| OPERATING EXPENSES | |
| Travel | ₱ 2,000 |
| RESEARCH MATERIALS | |
| Bond paper | ₱ 100 |
| TOKENS | |
| For 3 validators | ₱ 600 |
| PUBLICATION AND DISSEMINATION | |
| Printing and Binding of Thesis | ₱ 3,750 |
| Printing and Binding of Reports | ₱ 500 |
| TOTAL | ₱ 6,550 |

# APPENDIX C

## EXPECTED OUTCOMES AND IMPACT

The expected outcomes of this research are the following:

***Publication.*** This study will be written up and submitted for publication in highly regarded, peer-reviewed journals, especially to those who focus on educational studies.

***Product.*** The structured learning playlist guide will be utilized by schools, teachers, and students as an aid or alternative instructional material.

***Policy.*** The findings of this study will serve as documented evidence for the impact of integrating modern day learning preference and digital learning tools on learning and teaching physics.

***People Service.*** This study will benefit the students and teachers of physics as the learning playlist guide will enhance the quality of physics education by making the learning experience more digestible and engaging.

***Partnerships.*** Collaboration with schools, content creators, and students can be explored to further expand the implementation of the structured learning playlist guides.

***Patent/Copyright.*** The structured learning playlist guide and the created short-form videos may be copyrighted as an intellectual property, ensuring its proper use.

***Social Impact.*** This study aims to make Physics more accessible and appealing for students, sparking interest in STEM.

***Economic Impact.*** The implementation of the learning playlist guide can have a lesser cost than traditional instructional resources and can promote educational technology. Consequently, this can support the technology related workforce.

PHILIPPINE NORMAL UNIVERSITY
The National Center for Teacher Education

**CURRICULUM VITAE**

| | |
|---|---|
| **Name** | Aiza Mae S. Agunat |
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| **Place of Birth** | Parañaque City, Metro Manila |
| **Educational Attainment** | |
| **Collegiate** | Bachelor of Science Education with Specialization in Physics<br>Philippine Normal University |
| **Honors, Scholarships/Study Grants and Awards Received** | |
| | FSTEM Laurels Awardee |

**PHILIPPINE NORMAL UNIVERSITY**
The National Center for Teacher Education

## CURRICULUM VITAE

| | |
|---|---|
| **Name** | John Edward S. Otero |
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| **Place of Birth** | Subic, Zambales |
| **Educational Attainment** | |
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**Honors, Scholarships/Study Grants and Awards Received**

FSTEM Laurels Awardee