A Proposal Development of Model Design Interactive E-Book Using Generative AI

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Abstract

The objective of this research is to 1) study guidelines and develop a proposal model for designing an interactive e-book to get to know BCG with generative AI. 2) to collect specialist opinions through interviews. 3) to evaluate the design proposal model of an interactive e-book with generative AI. The researcher selected a sample group of 12 specialists using purposive sampling. This group was divided into two subgroups, as follows: Group One consists of specialists who are conducting interviews with 6 specialists to obtain their comments on the generated proposal model, and 6 specialists in Group Two are responsible for evaluating the proposal model. The research instruments included an e-book design proposal model using generative AI and an interactive e-book for getting to know BCG that used a proposal model in development. The instruments of data collection methods encompass specialist interviews from the fields of technology, education technology, and agricultural development, as well as certification evaluation forms for the proposal model. The researcher performed a content analysis of the interview and discovered that the specialists' comments were consistent, indicating that the proposed model was suitable. The innovative concepts and ideas were in line with the latest advancements in technology. The human role as an accuracy verifier had significant advantages, particularly in the context of agricultural media and other forms of media. This role also contributed to the creation of a growing body of new research. A proposal model evaluation determined that the interactive e-book proposal model had an excellent overall rating (Avg. 4.57 Std. 0.30). Data from evaluation forms using fundamental statistical measures like the average and standard deviation.

Keywords: interactive e-book, generative AI, design model, e-book development

Introduction

E-books are a digital format for distributing written content that offers the advantage of being easily accessible on various portable devices and capable of incorporating many forms of media. In the current digital era, e-books have become a popular publishing medium, especially for the educational community, due to their ease of creation and distribution in various formats. Therefore, it is crucial to create suitable e-books to deliver educational information effectively. According to data from We Are Social, e-books will be one of the top 10 digital media that Thai people spend the most money on acquiring by 2022. The predicted market share for this type of media is 10.8%, with expenditures exceeding 5.850 million baht (Kemp, 2023). As a result, it is critical to have the necessary creation tools, such as generative AI, for e-book development. This is because, depending on the type of work, generative AI is a flexible tool with numerous alternatives. For instance, in the Visual Art category, one can select to use Generative AI for artwork or video creation. Generative AI is also used in industries like fashion and architecture. (TCDC Resource Center, 2023)

TCDC Resource Center (2023) has defined generative AI as a technology that has emerged in response to the demand for producing diverse, rapid, and effective content. Making content in its original format requires significant effort and resources, and may not yield the desired outcome. Currently, several industries extensively employ generative AI. Particularly, artists, designers, and other individuals have been generating ideas in unique formats. Even throughout the educational community, there have been well-facilitated generative AI technologies. Warabuntaweesuk et al. (2024) have researched the utilization of generative AI in the film business. They explain that generative AI, capable of producing new content, finds numerous applications in the movie industry, such as the creation and design of locations. Generative AI aids in character creation, short film production, movie adaptation, and the integration of techniques. Phatanamahacharoen et al. (2024) used Midjourney to create characters based on the identities of Thai elephants. The pictures produced by Midjourney were then further developed into stunning 3D creations. The researchers also used Runway ML to create movies within e-books. Including Chat GPT, which supports researchers in this study for the creation of BCG Model content within e-books. This was accomplished by improving the content's cohesion and unity through revision and reorganization. These illustrations show the educational potential of generative AI and how well it works as a tool

for creating e–book designs. However there is a need for innovative concepts to help the process of development and design.

Instructional design, commonly known as the ADDIE Model, is a method for designing learning. According to Yongyut and Yentour (2021), the ADDIE Model was created by the University of Florida Educational Technology Center in the year 1975. The ADDIE Model became widely popular, particularly in educational media. The ADDIE Model operates on principles within five processes: 1) Analysis 2) Design 3) Development 4) Implementation 5) Evaluation (Phattarasatjatum, 2016) reveals a clear and direct correlation between the ADDIE Model process and media production. The development of such a model necessitates a comprehensive procedure that encompasses conceptual deployment, testing, and practical implementation. Design thinking, often known as the design thinking process, can facilitate the development process. Design thinking is a cognitive process that aims to address problems by gaining a deep understanding of user behavior and their responses to those challenges. Additional enhancements are made to adequately address their requirements. Design thinking and problem–solving are done using a five–step process: 1) Empathize 2) Define 3) Ideate 4) Prototype 5) Test (AdAddict, 2023) shows the similarity between these two ideas, though from opposing perspectives. Following these processes can potentially reveal the structure of the proposal model in its initial stages. So, it is crucial to utilize the ADDIE Model and Design Thinking to create the proposal model. As a result, it makes perfect sense to apply the ADDIE Model and Design Thinking while creating e–book designs.

The study has determined that creating an effective tool for designing e–books, a popular medium known for usage and functionality, necessitates a structured and methodical approach. ADDIE Model and Design Thinking will help provide a framework for development. Along with the use of efficient technology like generative AI, which can assist the design process thoroughly and include content, graphics, videos, voiceover, and background music. Due to these various factors, the researchers want to explore and develop a design proposal model for an interactive e–book to get to know BCG design with generative AI, and to create a proposal model for developing interactive e–books. By thoroughly examining the criteria for creating the preliminary model. Obtain specialist opinions and evaluation results from individuals with specialized knowledge and skills in areas relevant to model creation.

Research Objectives

1. To study guidelines and develop a proposal model for designing an interactive e-book to get to know BCG with generative AI

2. To collect specialist opinions through interviews

3. To evaluate the design proposal model of an interactive e-book with generative AI

Scope of Research

Content Scope

This research focuses on developing a proposal model for designing an interactive e-book with generative AI. The contents encompass a wide range of topics, including a review of many types of documentation, both primary data and secondary data, as well as research about the development of media production designs, e-books, generative AI technology, and the BCG Model. The e-books, created based on the proposal model, incorporate these topics as integral components. The content comprises 3 lessons formed by the operational plan of Thai development based on the BCG Economic Model from 2021-2027, BCG in Action, which are presented in an interactive e-book with generative AI. The goal of this format is to provide guidelines for the development of agricultural media and other media and to collaborate on generative AI in the future.

Populations scope

The population involved in the study is a technology or educational technology specialist and an agricultural development specialist who is experienced and has acknowledged academic work in educational institutions or universities that teach in the fields of agricultural technology or education and development throughout Thailand.

The sample group using purposive sampling comprised 6 educational technology specialists and 6 agricultural development specialists, for a total of 12 specialists.

Area Scope: In this study, the researchers collected data from various locations, according to the agency of specialists, as follows: 1) School of Agricultural Technology, King Mongkut's Institute of Technology Ladkrabang 2) Faculty of Agriculture at Kamphaeng Saen, Kasetsart University 3) Faculty of Agriculture, Kasetsart University 4) School of Education, University of Phayao 5) Faculty of Technical Education, Rajamangala University of Technology Thanyaburi 6) Faculty of Agriculture, Chiang Mai University 7) Office of Educational Technology, Sukhothai Thammathirat Open University

Time scope: The study took place for five months, from January to May 2024.

Literature Review

The researchers reviewed literature, the principles and theories of interactive e-books, the concept of generative AI, and the ADDIE instructional design model and design thinking process. This served as the foundation for the proposal model for creating interactive e-books, incorporating generative AI, that have content about economic development. All 4 theories and concepts formed the basis for a literary review to guide the study.

Interactive e-books

An interactive e-book is a digital publication generated by a computer program capable of bundling diverse content. comprises intricate components, text, photos, graphics, and sounds, and can be compatible with working. It boasts convenience and the ability to connect to other data sources. It is compatible with various devices, including portable devices and smartphones, and supports both online and offline in the same way as an e-book general type. Kumnuansin (2013) offers a precise definition of an e-book, which serves as the base for an interactive e-book. It is specified as an electronic publication created using a computer program. The interior encompasses a diverse range of information that can be perceived audibly, visually, or, in some types, it may be touched and connected to outside data. All the data is generated and stored in a digital format. It is compatible with mobile devices. When e-books and related interactive e-books have comparable patterns, the components are therefore similar. Penginta (2016) provides a detailed description of the component in the following manner: 1) A text or a number. 2) A still image refers to a graphic or photograph. 3) Animation is the introduction of a graphic image to produce motion. 4) Sound refers to a digital recording of audio that may be replayed. 5) Video is a multimedia format that allows for the simultaneous presentation of animated visuals and audio. 6) Interactive is where a user can respond to a multimedia system.

Ultimately, an interactive e-book is a distinct type of e-book that delivers content through various formats, utilizing internal media to connect books with other data sources. It is user-friendly and compatible with both conventional and mobile devices. Implementing this task necessitates the use of well-crafted design components and methodologies, which will differ depending on the content and the design tools.

Generative AI

Creative artificial intelligence, also known as generative AI, is a commonly used term to describe the field of artificial intelligence that focuses on creating new content. Cambridge Dictionary (n.d.) According to the University of Cambridge, generative AI is a computer characterized by possessing some properties that are also found in the human brain, such as the capacity to translate languages, recall images, and acquire knowledge from information. Additionally, they are capable of generating messages and images. The World Economic Forum (2023) has released an article stating that generative AI is a classification of AI algorithms capable of producing unique outcomes. TCDC Resource Center (2023) explains two benefits: 1) The benefits of Design Thinking include the ability to quickly collect and analyze substantial volumes of data from many sources, generate effective new ideas, and alleviate the workload of designers. It can generate templates for adaptable and customized experiments, thereby decreasing the time and expenses associated with experiments, and ultimately assessing test outcomes with precision. 2) The benefits of the design process support speedy and easy collaboration, as well as the ability to customize and alter information to suit various users in diverse circumstances. Additionally, it supports identifying and fixing design flaws and automating specific processes. Generative AI for creative work covers a range of categories, including content AI for designing content, visual art AI for making illustrations, video AI for producing videos, music AI for composing music, and voice AI for voiceovers.

In summary, generative AI refers to a sort of artificial intelligence that can generate new and unique data based on existing information. It can produce new information in various formats, primarily functioning as a tool that facilitates the brainstorming phase before design implementation, showcasing ideas, and contributing to the reduction of time and costs in the design process. Given these benefits, generative AI should be utilized in the process of developing e-book formats to optimize the visual appeal and make it much easier for those interested in developing e-books to access and create them.

ADDIE Instructional Design Model

ADDIE Model is an instructional design that enables more abilities and experiences by students or users. Globish (2021) argues that the ADDIE Model serves as the fundamental framework for instructional design, and can be used in design, media, activities, and courses, from start to finish. Ploysri (2017) stated that the instructional design process utilizing the ADDIE Model contains

five stages: 1) analysis, which involves comprehending the issues faced by students or users. 2) Design is the act of establishing the specifications for instruments, such as displays, information, colors, etc., that will be utilized in the learning process. 3) Development refers to the systematic process of developing and building a tool such as a multimedia project or a website. 4) Implementation of built-in tools in specific processes 5) Evaluation is the systematic assessment of the entire process, encompassing both comprehensive evaluation and evaluation for development.

In essence, the ADDIE Model is a design process that creates learning experiences through multiple tools such as teaching materials, videos, websites, and more. This correlates with the development of e-books, as the ADDIE Model consists of five stages: analysis, design, production, implementation, and evaluation, which may be utilized as a design process. For this reason, the ADDIE Model is suited for the development of e-book formats. However, the ADDIE Model may not be sufficient on its own, as there should be methods or approaches for thinking in the development phase to enhance the quality of the design, which coincides with the design thinking process.

Design Thinking

Design thinking is a method for developing tools, media, or products by considering the needs and issues of users. Meoupphakarn (2023) describes design thinking as a method of problem-solving that prioritizes human-centered design and repeats procedures that genuinely result in problem-solving. TCDC Resource Center (2023) specifies that the design thinking method has five processes that are necessary for problem-solving. consisting of 1) Empathize: To comprehend the user, it is essential to identify the user's requirements and collect relevant information, such as any problems or challenges faced by the user. 2) Define: data collection is crucial in understanding the problems that arise. This involves offering an overview of the problems, for instance, by employing a survey to inquire about users. 3) Ideate: the creation of ideas is the system process of generating concepts and principles that eventually contribute to user problem-solving in the define, such as brainstorming 4) Prototype: prototype creation identifies the problem through the prototype and can be improved to perfection before implemention 5) Test: testing is the process of presenting a prototype to a user or target group and soliciting feedback for improvement and correction.

In summary, design thinking is a problem-solving method that is centered on the needs of users, focusing on the making of tangible outcomes. This approach is excellent for this research study as it comprises full processes for generating media: empathize, define, imagine, prototype,

and test. These processes may support and enhance the ADDIE Model, leading to better development of the e-books model and ensuring quality in the processes of examining demands, as well as in developing ideas and designing models.

From a literature review of all concepts and principles, it was determined that the development of e-books should have a clear model. In this research, ADDIE Model processes have been updated in conjunction with design thinking. This new approach will combine generative AI to support multiple tasks, such as content generation and related media, facilitating faster work and significantly reducing the workload. This is related to the research results, which can be discussed through the proposal model produced by the researcher based on the ADDIE Model and design thinking, resulting in a refined proposal model that has increased in quality following the research. This information can be found in the research results.

Research Methodology

This research was conducted as research and development, which focuses on studying information from documents and collecting information from educational technology or technology specialists and an agricultural development specialist through the process of an interview and evaluation of the proposal model, The following details were considered

1) Documentary Study

The study compiled information from interactive e-book documentation and used generative AI to collect information, development guidelines, and tool advantages, including studies on the ADDIE Model and Design Thinking as a base for the proposal model. The findings revealed that streamlining the studied data can provide insights into creating interactive e-books using models.

2) Population and Samples

The population involved in this study consisted of technology or educational technology specialists and agricultural development specialists with academic experience and recognition at 7 academic institutions or universities that offered courses in technology or educational technology and agriculture development. These institutions included: 1) School of Agricultural Technology, King Mongkut's Institute of Technology Ladkrabang 2) Faculty of Agriculture at Kamphaeng Saen, Kasetsart University 3) Faculty of Agriculture, Kasetsart University 4) School of Education, University of Phayao 5) Faculty of Technical Education, Rajamangala University of Technology Thanyaburi 6)

Faculty of Agriculture, Chiang Mai University 7) Office of Educational Technology, Sukhothai Thammathirat Open University. The researcher divided a total of 12 specialists into two categories: technology and educational technology. 6 specialists and agricultural development 6 specialists. The purposive sampling method was used, with the selection criteria for specialists in technology or educational technology being at least 5 years of experience in the field or providing knowledge in the design or development of educational technology, along with recognized academic work in the field of education. The selection criteria for specialists in agricultural development required at least 5 years of experience in the field or providing knowledge in agricultural development, in addition to having recognized academic work in the field of education.

3) Research Instrument

1. Design the proposal model of an interactive e-book to get to know BCG with generative AI. The model was based on the instructional design, or ADDIE model, which provides guidelines for developing instructional media, lessons, or activities. While the ADDIE Model is useful for information collection and media development, the researcher observed that three out of the five processes lacked detail in design and systematic thinking. To address these limitations, the researcher integrated design thinking, which offers benefits in understanding and solving user issues. Design thinking also has a similar overarching structure to the ADDIE Model. The researcher combined the processes of the ADDIE Model with those of design thinking, adapting the processes to suit this research. Generative AI was then integrated into the created process, resulting in a process consisting of six processes: Process One: Researching relevant information (analysis & definition), Process Two: Defining components (ideate), Process Three: Designing (design), Process Four: Developing the media (development), Process Five: Implementation (implement), and Process Six: Evaluation (evaluation).

2. Semi-structured interview. specifically designed for specialists in the field of technology or educational technology. One edition comprised 6 primary questions, while for agricultural development specialists, one edition comprised 5 primary questions. The questions related to the overall proposal model, components of the proposal model, process of the proposal model, appropriateness of illustrations and content, relevance to agricultural development, and others based on the additional opinions of the specialists. These two semi-structured interview forms differed slightly since the interviewed specialists were from two specialization fields, therefore, the nature of

the questions emphasized various aspects. However, the questions covered all the information as indicated above. The interviews were conducted through an online one–on–one method, following the order of questions as indicated in the interview form and allowing specialists to give additional suggestions beyond the question. The collected opinions were subjected to content analysis and used to further enhance the proposal model for greater completeness. The researchers conducted a validity test on the interview to determine its content validity. The researchers presented the questions in an interview created for a total of 3 specialists to obtain improved validity by analyzing the evaluation of the index of item–objective congruence, or IOC. The Question Consistency Index was found to be higher than 0.6 for all queries and showed improvement based on specialist guidance.

3. Certification evaluation forms for the proposal model comprised 6 sections: Section I: Study into the Development of a Model for Interactive e–books design, Section II: Components of a Model for Interactive e–books design, Section III: The process of the design of interactive e–books, Section IV: the process of the development of interactive e–books. Section V: The practical uses of the model for interactive e–books. Section VI: Evaluating the model's use for interactive e–books. The Likert scale served as the rating scale. The Likert scale, comprising 5 levels, employed a total of 23 questions. In the process of reviewing the proposal model, the researcher provided the adjusted proposal model from the interviews to the specialists along with the certification evaluation forms. The evaluation results were evaluated using descriptive statistics by calculating the mean and standard deviation, followed by a discussion of the results. The researchers conducted a validity test on the certification evaluation forms to determine their content validity. The researchers presented the questions in certification evaluation forms created for a total of 3 specialists to obtain improved validity by analyzing the evaluation of the index of item–objective congruence, or IOC. The Question Consistency Index was found to be higher than 0.6 for all queries and showed improvement based on specialist guidance.

4) Data collection

The researchers had a diverse array of methods and processes at their disposal to collect data for research objectives. With the following processes:

(1) The researchers studied the ADDIE Model and Design Thinking by examining the methodology of each concept and establishing connections between the processes. They then

constructed the structure of the e-book by integrating the components developed by the generative AI. This was then summarized as a basic model.

(2) The researchers conducted semi-structured interviews with a sample of technology or educational technology specialists as well as agricultural development specialists, totaling 6 specialists. The specialists were selected through a purposive sampling process according to the specified conditions. The researcher began the interview process by providing the basic model and a sample of the e-books prepared by the researcher to the specialists before the start of the interview day. The interviews were conducted using online tools via Zoom and Google Meet, allowing the specialists to provide further feedback. Subsequently, information and feedback from the interviews collected were used to develop the proposal model to enhance its completeness according to the specialists' opinions.

(3) The interview data was summarized using the content analysis method to create a design proposal model for a design of interactive e-books for getting to know BCG with generative AI. The researchers enhanced the processes based on specialist input obtain a comprehensive proposal model. The proposal model consisted of six processes as follows:

Process One: Analysis & Define

Process Two: ideate

Process Three: Design

Process Four: Development

Process Five: Implement

Process Six: Evaluation

(4) A proposal model was provided to a sample group for certification evaluation. The proposal model for the design of interactive e-books for getting to know BCG with generative AI was presented to the sample group, which consisted of technology or educational technology specialists and agricultural development specialists selected through purposive sampling. A total of 6 specialists were included in the sample group according to the specified conditions.

(5) The data from the proposal model validation evaluation was collected to find the data's average and standard deviation.

5) Data Analysis

The researcher used the data collected through interviews with technology or educational technology specialists and agricultural development specialists. The researcher conducted a content analysis and used the proposal model certification evaluation data to summarize the concepts' results. Statistical measures, namely the averages and standard deviation, were applied to examine the information. The scores and performance levels were analyzed and understood. The interpretation was determined based on BEST's criteria. (Best & Kahn, 1986)

The average is between 4.50 and 5.00 Average Excellent

The average is between 3.50 and 4.49 Average is Very good

The average is between 2.50 and 3.49 Average Good

The average is between 1.50 and 2.49 Average Fair

Averages are between 1.00 and 1.49 Average Poor

According to approved criteria, it was rated at 3.50, indicating a very good level of quality.

Research Results

Objective 1: To study guidelines and develop a proposal model for designing an interactive e-book to get to know BCG with generative AI. The study found that there are ten important processes involved in the design and creation of e-books. In all ten processes, generative AI has been utilized in processes three through seven. Consisting of: 1) Creating a Storyboard 2) Interactive Design 3) Creating Content: This process involved leveraging existing content alongside generative AI tools in the Content AI group, such as ChatGPT and Gemini. 4) Creating Images and Illustration: Content was used as keywords to generate illustrations with generative AI tools in the visual art AI category. The researcher employed Recraft.AI for illustrations, and Midjourney and Leonardo AI for video illustrations. 5) Creating Voiceover: Generative AI tools in the Voice AI category, including Botnoi Voice, were used for this process. 6) Creating Music: Music AI tools, such as Music Gen, were employed to define the mood, genre, and theme of the music. 7) Creating Video: The researcher utilized video AI tools including Runway AI, Genmo, and Leonardo.AI, which can create videos from images and allow for adjustments to camera movements and lighting, etc. 8) Video Editing 9) Creating an Interactive Link 10) Combine all types of media and prepare the e-books for publication. Additionally, the researchers have studied the ADDIE model and design thinking,

specifically focusing on development guidelines. The researchers analyzed the processes of both concepts and summarized the proposal for the development of a model design interactive e-book as a preliminary, consisting of 3 components: 1) Knowledge: Knowledge required for e-book development. 2) Content: Getting data collection ready for use with generative AI. 3) Tools of the Future: Tools used throughout the entire process. All three components encompass six processes:1) Analysis & Define 2) ideation 3) Design 4) Development 5) Implement 6) Evaluation.

From the interviews with specialists for objective 2, the researcher conducted interviews with 3 specialists in technology or educational technology using a set of 6 primary questions and 3 specialists in agricultural development using a set of 5 primary questions. These specialists were selected based on specific criteria: they must have at least 5 years of experience and knowledge in the relevant specialization, namely technology or educational technology, and agricultural development, in addition to having recognized academic work in the field of education. Overall, it was found that the proposal model was appropriate. In the future, generative AI has the potential to enable the entire process of generating high-quality work, ranging from the beginning to the end. There was a strong likelihood that this proposal model would be used, as it has the potential to modernize agricultural media production. Furthermore, there was the potential to inspire and provide innovative ideas to a new generation of individuals in agriculture. The researchers summarized their opinions from the specialists into 4 aspects below.

1. Components and processes of the proposal model

The components and processes of the proposal model had qualities that had the potential to substitute standard media production, not just in agriculture but also in other groups or education in the field of generative AI. Researchers could use this proposal model as a reference in their academic work. Users should thoroughly study the proposal model before using it, particularly those in the agricultural field. Insufficient understanding of the tools may result in not achieving the expected benefits. Moreover, users must acquaint themselves with the copyright details associated with generative AI to guarantee compliance. Therefore, the proposal model should explicitly include this information to enhance its usefulness.

2. Content

The content was conducive to storytelling. The media could be understood at the desired point. The content created by the proposal model enhanced the user's perception of the content.

Another benefit was that generative AI could generate reference content directly from the supplied information. However, users should verify its correctness before utilizing the content created by generative AI. As generative AI had a chance to alter the content by producing new sentences and text that may deviate from reality.

3. Design

The design was visually appealing, captivating, and user–friendly. The artwork and videos featured in the e–book were aesthetically pleasing and harmonized well with the information. However, users of this proposal model should exercise caution in their utilization because the photos and videos created by generative AI may not align with particular needs. If the photos and videos were real and similar to photos and videos captured by the photography device, it is advisable to thoroughly verify their authenticity. Due to its limited grasp of visual realism, generative AI might have trouble correctly creating an image resembling a Thai person in Thailand. For example, creating an image that looked like a Thai native in Thailand harvesting might result in the picture being an Asian figure dressed in traditional attire from either Laos or Vietnam.

4. Development with Generative AI

The compatibility between generative AI and the proposal model was complete. However, to enable generative AI to create or generate objects in a certain order, it was important to have controlling keywords dedicated to the management of the specific generative AI. The tools were referred to as "prompts" which in the proposal model should have specified how to create additional prompts to produce work accurately and precisely. The prompt varied depending on the user. However, it was crucial for users to consistently consider that generative AI served only as a tool to assist users and had a high risk of error. A key feature of this proposal model was manually checking what generative AI created. This manual checking enhanced the quality of work derived from the proposal model. In the future, it may be improved to use more generative AI, because generative AI should be mostly used 100% inside the proposal model. The primary purpose of generative AI is to minimize costs and reduce people's working hours.

From the opinions of the 4 aspects, it was apparent that the benefits of generative AI could significantly enhance creativity and efficiency, as well as reduce working hours. This led to the proposal for the development of a model–design interactive e–book using generative AI, which could shorten the workflow. As in normal illustration design, designers needed to identify ideas that

connected with the content and design graphics themselves. But, in this new working process, designers could use generative AI to take on this function instead. Additionally, it could also be used for content design. The researcher would like to highlight the content design of the BCG Model, which was part of the e-book that the researcher had produced as an example of the proposal model. The researcher took content from reviewed literature and applied Generative AI to refine the language, structure the story for continuity, and enrich specific content, as well as asking about content that the researcher still lacked. However, as described in the example, the design must remain under the Generative AI user; otherwise, there was a large chance of mistakes, as opined by the specialists in the fourth aspect of development with generative AI.

Objective 3: To evaluate the design proposal model of an interactive e-book with generative AI derived from study guidelines and develop the proposal model based on specialist opinions collected via interviews. The proposal model was examined by six technology or educational technology specialists and agricultural development specialists. The rating scale contained the qualities of excellent, very good, good, fair, and poor. The researcher calculated the averages and standard deviations using descriptive statistics methodologies.

Table 1 Averages and standard deviations of opinion levels collected from certification evaluation forms by technology or educational technology specialists, as well as agricultural development specialists.

Question	Avg.	S.D.
Study problems to proposal model development	4.50	0.54
User group analysis	4.50	0.54
The proposal model objective	4.66	0.51
Concepts of proposal model development	4.83	0.40
Limitations on the proposal model	4.50	0.83
Components of an e-book structure	4.66	0.51
Component of content	4.83	0.40
Component of visual, video, and audio aspects	4.83	0.40
Component of interactive	4.50	0.54
Creating a storyboard	4.33	0.51
Interactive design	4.50	0.54
Creating content with content AI	4.33	0.51
Creating images and illustrations with visual art AI	4.83	0.40
Creating voiceover with voice AI	4.50	0.54
Creating music with music AI	4.66	0.51

Creating a video with video AI	4.50	0.54
Video editing	4.50	0.54
Creating an Interactive Link	4.66	0.51
Combine all types of media and prepare the e-books for publication.	4.66	0.51
Testing using an e-book development with a proposal model (try out)	4.33	0.51
Implementation with the process of collecting data from users of e-book	4.50	0.54
Evaluation and measurement	4.50	0.54
Satisfaction assessment	4.50	0.54
Total	**4.57**	**0.30**

According to the data in Table 1, the overall evaluation was divided into four groups. Group one: the design proposal model of an interactive e-book with generative AI, with an average score of 4.57 and a standard deviation of 0.30. This score was higher than the value that was considered acceptable. Additionally, when examining the question responses, it was found that the concepts of proposal model development, components of visual, video, and audio aspects, creating images and illustrations with visual art AI, and compilation received an excellent rating (Avg. 4.83 S.D. 0.40). Group two: the proposal model objective, Components of an e-book structure, Creating music with music AI. Creating an interactive link, combining all types of media and preparing the e-books for publication were excellent on average, although across different averages (Avg. 4.66 S.D. 0.51). Group three: study problems to proposal model development, user group analysis, limitations on proposal model, a component of interactive, creating voiceover with voice AI, creating video with video AI, video editing, implementation with the process of collecting data from users of e-books, evaluation and measurement, and satisfaction assessment. The average value was excellent (Avg. 4.50 S.D. 0.54). This group was regarded as having the biggest number of questions, and the lowest average question was Group four: creating a storyboard, creating content with content AI, testing using an e-book development with a proposal model (try out), with an excellent average. However, when compared to all other groups, this group of questions was the one with the lowest average. (Avg. 4.33 S.D. 0.51)

In addition, the specialist offered recommendations on how to execute the pattern improvement by grouping specialists according to their type.

1. Technology or educational technology specialists: The researcher should have added implementation components to determine the specific device or program for users to access an e-

book. In the field of interaction, design features related to the user experience may have been included, while the user interface primarily focused on the user's interaction with the e-books. While combining all types of media and preparing the e-books for publication, you may have been instructed to utilize a program for combining media. Generative AI should have been identified in each process of the flow chart so that the proposal model can be applied immediately. Additional information on the utilization of the ADDIE model and design thinking in the design process should have been provided about the prompt.

2. Agricultural development specialist: The researcher should have tried out with a wide range of users to get feedback and enhance the media for improvement. It should have had a precise indication of the number of individuals that would be included in the experimental procedure. The duration required to utilize the media should have been specified. The learning process design should have been added to each topic in e-books and evaluated after the end of each topic to see what the users had learned and understood. To facilitate learning on the upcoming topic, it is important to assess each individual's level of knowledge. Additionally, the use of generative AI to generate content should have been customized for the specific needs and features of the target group. Importantly, the process of combining all types of media and preparing the e-books should have been detailed in terms of their features and limitations, as well as guidelines on how to use them on various devices and web browsers that are appropriate for usage and should have been provided with guidelines on how to engage the target group in using these e-books.

Discussion

The research found that objective one, which is mandatory in the form, consists of 3 components: 1) Knowledge: Knowledge required for e-book development. 2) Content: Getting data collection ready for use with generative AI. 3) Tools of the Future: Tools used throughout the entire process. Are categorized into 6 processes. Consists of: 1) Analysis & definition 2) ideating 3) design 4) development 5) implement 6) evaluation, which is based on the ADDIE model and design thinking. According to Butsai (2022), it can be concluded that the guidelines for management and innovation in learning consist of 5 processes: 1) empathize 2) define problems 3) ideate 4) prototype 5) test based on design thinking. Consistent with Junwandee (2017), the results of the research have been

presented in the part of the study on learning activity design, which is from the ADDIE Model. Consisting of: 1) analysis 2) design 3) development 4) implementation 5) evaluation

The interview with a specialist confirmed the suitability of the proposal model and its comprehensiveness for a thorough academic process, as summarized in the following 4 key aspects for objective 2: 1) Components and processes of the proposal model have the potential for use in developing media, like the instruments able to publish the concept idea, and they also have the potential to be used in academic endeavors. 2) Content: straight to the point, generative AI enhances content unity, resulting in improved user comprehension. 3) Design: The text is visually appealing, legible, and does not cause visual disturbance. Due to the use of realistic images. Generative AI graphics enhance understanding by visually presenting content in the same way. 4) Development with Generative AI: Completely. The human review process decreases the likelihood of errors produced by generative AI completely. The human review process decreases the likelihood of errors produced by generative AI. Additionally, there are several potentials for continuing advancement, which will enhance the flexibility and efficiency of work, maybe leading to decreased expenses and labor requirements in the media development process. This is a highly good utilization of the benefits of generative AI. The following is consistent with the findings of Nondhawathana (2015), who conducted a study on the development of e-books for students in subjects related to innovation and technology. Found that the design and typography are visually appealing and very legible. The voiceovers are easily understandable. In addition, this is consistent with Pimpapian's (2017) research results on the topic of the design of e-books creative bamboo found that the infographic design combination of infographics and images to create a story that is contained can be presented clearly and with easy accessibility. From consistency with both researches, the content must be presented in a clear and easily readable manner. This can be achieved by implementing appropriate patterns, colors, fonts, images, and other components.

For the last objective, it was found that all the evaluation results and all the questions were at an excellent level. The highest score in the evaluation results will be found in the group of concepts of proposal model development, including components of content, visual, video, and audio, and creating images and illustrations with visual art AI. It is probably because of the concept of the proposal model from generative AI, which can produce various forms of content like images, videos, voiceovers, and music. This technology ended up becoming the proposal model's strongest point as

a consequence of the evaluation mentioned above. Leiker et al. (2023) conducted research on generative AI for learning: Investigating the potential of synthetic learning videos. The research found that the sample group was unable to see any distinction between conventional and synthetic videos. In the study by Phatanamahacharoen et al. (2024), they condensed their research findings on the utilization of artificial intelligence technology for character creation based on Thai identity. Generative AI Midjourney has been found to possess intriguing potential since it is capable of realistically generating visuals and modifying patterns according to user preferences. From the coherence of the research, it was found that the introduction of generative AI into the media production process is possible, as it is a potent and efficient tool. This aligns with the third objective and is supported by the findings in the specialist opinion of the interviews.

Conclusion

The research found that the proposal model developed by the researchers shows an excellent level of quality, as evaluated through proposal model evaluation. As a result of the study of the proposal model development, including the ADDIE Model and Design Thinking, a proposal model was produced that may be applied in the agricultural development of media and other media. The proposal model can also be adapted to match specific features of the media. Furthermore, proposal model development includes a thorough and broad process and application that encompasses information collection, component definition, design, development, implementation, and evaluation. When the researcher applied the proposal model via the media, it was found that a proposal model creates a unique identity for the media in 3 aspects: 1) Design, enhancing the aesthetic appeal of the developed media. 2) Content, which can help sort and personalize the content according to user preferences. 3) Development with Generative AI: this will enhance the effectiveness of media production and reduce the duration of communication production and work while facilitating researchers to create new concepts and tools. This research also helps in education. Able to produce media more conveniently and easily.

Suggestion

According to their research, the researchers propose the following suggestions:

1. Suggestions from research

Studies have found that proposal models are likely to be used in media production and may be used as academic references. The implementation of a proposal model requires knowledge of the subject related to the proposal model. Consequently, additional measures should be taken in the following ways: 1) Study the use of prompt commands to order more generative AI. 2) Further explore media design concepts in the field of art, including the appropriate utilization of colors, among other aspects, to ensure coherence in the generative AI command when executing the prompt. 3) Explore the media user needs well to get quality media and match the needs of the target group that the researcher needs.

2. Suggestions for future research studies

A survey of the target groups' demands is necessary to develop a proposal model. Given that each target group has different requirements, surveying to identify these requirements can enable the proposal model to produce a greater variety of media that responds to their specific demands. Further research should be conducted to expand on the proposal model, enabling the use of generative AI in media production from start to finish.

New Knowledge

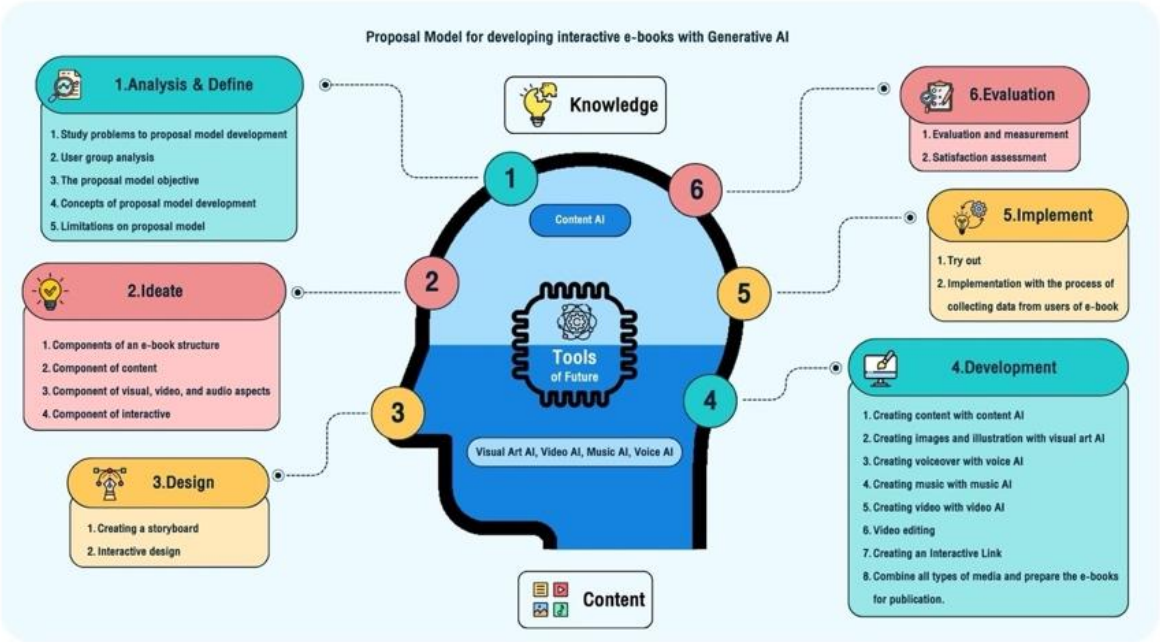

Figure 1 Proposal Development of Model Design Interactive E-book Using Generative AI.

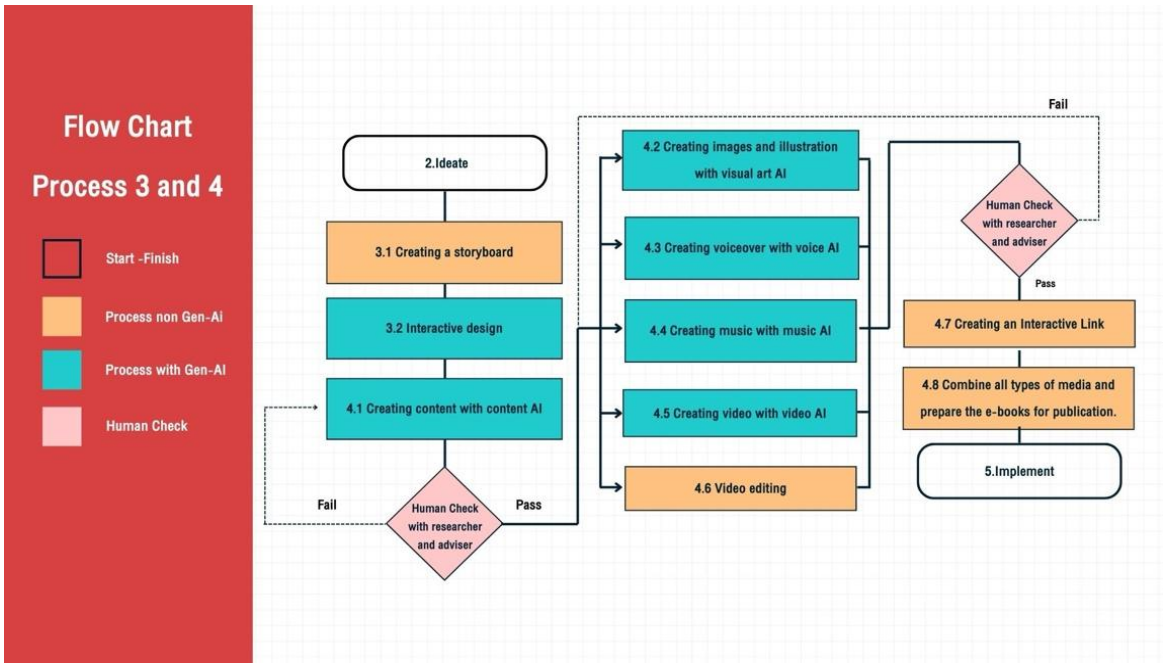

Figure 2 Flow Chart in Proposal Development of Model Design Interactive E-book Using Generative AI.

Figure 3 Examples of Interactive E-book Using Generative AI Get to Know BCG.

This proposal model highlights that the design proposal model of an interactive e-book with generative AI comprises 3 components: 1) Knowledge 2) Content 3) Tools of the Future, tools in which these components contain executable processes are 1) Analysis & define 2) Ideate 3) Design 4) Development 5) Implement 6) evaluation, and there is a crucial design methodology. Consisting of: 1) Creating a Storyboard 2) Interactive Design 3) Creating Content 4) Creating Images and Illustration 5) Creating Voiceover 6) Creating Music 7) Creating Video 8) Video Editing 9) Creating an Interactive Link 10) Combine all types of media and prepare the e-books for publication. Now, let's explore an example of an interactive e-book called "Get to know BCG." This e-book has been created using a proposal model for designing an interactive e-book with generative AI to generate the content following the processes outlined before. This knowledge supports the development of media production processes in a different format that is both easily and quickly accessible. Develops media production into something more versatile.

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