



Entrepreneurship Opportunities in Electronic Physics Learning Media: A Literature Review

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Abstract

Electronic physics learning is one of the rapidly growing fields in the current digital era. Electronic physical science learning media has turned into a compelling and effective option in the growing experience. The point of this examination is to lead a writing survey on business venture potential open doors in electronic material science learning media. Descriptive analysis is used as the research method, and secondary data is utilized. Entrepreneurship opportunities refer to the chance to run a profitable business. An entrepreneur needs to possess creative and innovative thinking, as well as the ability to take risks and seize business opportunities. Physics learning media is a tool used in the learning process to clarify the messages conveyed by teachers. Learning media that aligns with technological advancements, such as computer-based learning media and animations, can enhance students' interest in studying physics. Electronic-based learning (e-Learning) utilizes information and communication technology for flexible learning, involving networks, learning support services, and tutor assistance. Through e-Learning, students can learn anytime and anywhere. The development of digital media in e-Learning can leverage the latest technologies, such as animations, Android-based applications, and augmented reality.

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INTRODUCTION

Electronic physics learning is one of the rapidly developing fields in the current digital era. Electronic physics learning media has become an effective and efficient alternative in the learning process. As indicated by the Guideline of the Ministry of Education and Culture of the Republic of Indonesia Number 23 of 2015 concerning the Standard Course of Essential and Auxiliary Training, learning media refers to everything used to convey information or knowledge, including printed materials, visual materials, and audio materials [1].

As expressed by Martin Zwilling (2014), a technology business consultant, "Entrepreneurship is not about creating a company, but about creating something useful and profitable." Therefore, entrepreneurial opportunities in the field of electronic physics learning media can be utilized by developing creative and innovative ideas to deliver products and services that are beneficial to users [2].

In the current digital era, the development of technology and digitalization has opened up great opportunities for the development of more innovative and interactive electronic physics learning media. According to Michael Moore (1989), an expert in distance learning, good learning media should be interactive and help learners achieve a better understanding of a concept [3]. There are numerous pioneering open doors in the field of electronic physical science learning media that

can be used. One example is the development of an online learning platform that provides interactive and enjoyable electronic physics learning materials, such as instructional videos, interactive quizzes, and electronic physics simulations. Additionally, the development of electronic physics learning software, such as educational games, is also an attractive entrepreneurial opportunity to explore.

Many entrepreneurs have taken advantage of entrepreneurial opportunities in the field of electronic physics learning media. For example, there are entrepreneurs who develop mobile applications for electronic physics learning that are integrated with e-learning platforms, allowing students to learn flexibly and efficiently from anywhere. There are also entrepreneurs who develop hardware for electronic physics learning, such as laboratory equipment that can be connected to digital devices and connected to the internet.

In this article, a literature review will be conducted regarding entrepreneurial opportunities in electronic physics learning media. This writing survey will frame potential enterprising open doors that can be used in the advancement of electronic physical science learning media. Additionally, it will also present several examples of products and services that have been successfully developed by entrepreneurs in this field.

In conclusion, entrepreneurial opportunities in electronic physics learning media have great potential for development. These opportunities can be utilized by various parties, both individuals and educational institutions. Developing entrepreneurial opportunities in the field of electronic physics learning media requires creative and innovative ideas that can meet market needs and provide benefits to users.

METHODOLOGY

Descriptive analysis is used as the research method. According to Arikunto (2013), the purpose of descriptive analysis is to present analysis findings in clear, systematic, and detailed forms of words or sentences [4]. The explanations provided in this writing are based on relevant literature study findings related to the subject being discussed. The selection of writings depends on two rules, particularly the significance to the examined subject and considering the legitimacy and validity of the substance and items in the writings.

This research utilizes secondary data, which refers to data that is not directly observed. However, the information is obtained from research conducted by previous researchers. Optional sources of information referred to are books and essential or unique logical reports contained in printed or potentially non-printed articles or journals.

The initial step taken is to thoroughly review and survey fundamental and supporting writings to discover the main ideas from sources related to the subject matter of this review, becoming a specific investigation that can answer the question of entrepreneurial opportunities in electronic physics learning media.

RESULTS AND DISCUSSION

The accompanying depicts a survey of articles containing codes, years, kinds of showing materials and examination results which are summed up in Table 1.

Table 1. Summary of the article review

Code	Years	Types of teaching materials	Research Results
M1	2019	Module	The resulting product takes the form of an electronic physics module that has been successfully developed within the module. It encompasses various features, including content on momentum and impulse, an introduction, instructions for module usage, a main menu, learning objectives, fundamental competencies, concept maps, visuals, videos, summaries, examples, questions for each sub-chapter, experimental worksheets, practice questions

			with accompanying feedback, a bibliography, and author profiles. Moreover, the feasibility of using this electronic physics module has been assessed through validity and readability testing, confirming its suitability and effectiveness.
M2	2019	Worksheet	The outcome of this development is an electronic student worksheet equipped with guided inquiry-based PhET simulations focusing on the topic of light refraction. The components of this research include the Schoology website, student worksheets based on guided inquiry, and the PhET simulations. These parts were then approved by specialists, to be specific educated authorities, media specialists, and learning specialists. The approval results from the educated authorities showed an understanding score of 80% as satisfactory, the media experts scored 85% as highly acceptable in their interpretation, while the learning experts scored 74% as acceptable in their interpretation.
M3	2022	Mobile Learning	This exploration creates a legitimate and down to earth material science learning media in view of Android portable learning.
M4	2017	Electronic Module	The exploration has brought about an intelligent electronic book on quantum material science that can be utilized as a learning asset in both homeroom and self-concentrate on settings by twelfth grade understudies at SMAN 1 Pringsewu. The produced book has been deemed interesting, easy to understand, and beneficial based on questionnaire responses, and it has demonstrated a moderate level of effectiveness based on the N-gain values obtained.
M5	2023	Electronic Book	The exploration discoveries show that the eIUE (electronic Intelligent Comprehension of Material science) item is considered appropriate for use in physical science training at the secondary school level. Additionally, high school students responded very positively to the utilization of the eIUE product in physics learning.
M6	2023	Practicum Module	The analysis of the module's results indicates that the module is designed to provide a highly comprehensive description of the subject matter. The incorporation of technological innovations is necessary to enhance the visualization of video tutorial demonstrations. The design of the practical module innovation is developed based on the analysis results utilizing augmented reality in presenting experimental procedures.
M7	2021	Javascript	Firstly, JavaScript can be used in developing physics learning media for the topic of Static Electricity easily due to its open-source nature, high-level language, and offering convenience and flexibility. Secondly, the legitimacy examination results utilizing the record proposed by Aiken show that the legitimacy scores got from Well-informed authorities have a typical score of "0.82" in the "Extremely High" class, while the scores acquired from IT/Media Specialists have a typical score of "0.78" in the "High" class. Thirdly, the restricted testing results show that the level of Understudy Reactions is 86.56% in the "Excellent" class, and the typical rating of Educator Reactions is 3.42 in the "Upside" class. Therefore, it can be concluded that the development of physics learning media using JavaScript for the topic of Static Electricity has successfully become a valid and practical learning media.
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M8	2022	Edmodo	The examination results demonstrate that the item improvement has arrived at the assessment stage, with a typical approval score of 4.53, which falls into the "excellent" class. Essentially, the nature of the mixed learning virtual preliminary outcomes, in light of critical thinking from the two educators and understudies, is likewise evaluated as "generally excellent." In view of this data, a virtual mixed learning in light of Edmodo with compelling critical thinking systems has been created and is suggested for execution in the Fundamental Material science course.
M9	2022	Audiovisual Media	The understudy reaction survey results demonstrate that the formed media falls into the commonsense classification with a score of 80.59%. The adequacy of the item, in view of the N-Gain worth of 0.67, falls into the moderate classification. This examination proposes that the created varying media in view of the I-SETS approach is substantial, functional, and powerful for use in essential material science lab meetings. Besides, it might likewise have potential for advancement in different subjects or trains.
M10	2023	Electronic Module	The e-module combines features such as videos, audio, and interactive quizzes. The advancement cycle follows the ADDIE model, where the scientist assesses each move toward the improvement interaction. The e-module is created as per the CTL sentence structure. Validation of the e-module takes place during the development stage. The validation results by subject matter experts obtained a score of 85.09%, while the media experts obtained a score of 82.14%. The e-module is implemented in small groups consisting of nine students, and a score of 84.71% is obtained. These scores indicate that the e-module is considered suitable and of excellent quality.
M11	2022	Computer Simulation	The created swaying recreation programming meets the models and is reasonable for use in learning wavering frameworks. The advantage of this exploration is to decide the waveforms of reproduction engendering and their superposition, which can be utilized for material science research purposes and are reasonable for understudies to learn physical science

Entrepreneurial Opportunities

Entrepreneurial opportunities refer to a situation where an individual or a group has the chance to start a business. Business opportunities essentially entail potential profits. All the conditions presented to you are offers for business activities that are suitable for you to pursue and can potentially provide remarkable profits if the intended business opportunities are effectively utilized and presented in a way that yields the expected rewards. It is also important to emphasize that new business opportunities are spaces for independent creativity. Moreover, it is not merely an activity associated with following lifestyles and trends.

To establish a business and choose the right one based on the capital possessed by the prospective entrepreneur, one must have creative and innovative thinking to achieve optimal results. Not everyone is capable of recognizing opportunities, and those who do may not always have the courage to seize them, resulting in many missed opportunities. Only an entrepreneur who can think critically, take risks, and quickly respond to opportunities can truly exploit them. The doors opened by potential business ventures will undoubtedly bring consequences for the leaders. It can be said that it generates money if successful, but if not, it is part of the risks that need to be taken. Nevertheless, it can be an immensely satisfying experience.

According to Agus Budi Purwanto, "An entrepreneur is an individual who possesses the courage to face challenges, the ability to perceive and survey business opportunities, and demonstrates praiseworthy conduct in running a business while relying on their own capabilities." Entrepreneurship can also be described as a combination of economics, sociology, and fields related to history. In this context, the business venture concept is associated with fundamental ideas from different disciplines, forming a coordinated sociological discipline that is interconnected. Entrepreneurship, which refers to a person's behavior in carrying out a motivated activity, also includes the capacity to conduct business and produce goods or services by making use of the resources that are at one's disposal in order to achieve effective goals and maximize profits [5].

Opportunity analysis must be carried out prior to starting a business. The first step is to look into opportunities' sources, then look at success rates, business growth, and maintaining success. Opportunities are possibilities that arise spontaneously before they develop into ideas for starting a business [6].

Physics Learning Media

In general, the plural form of the word "medium," which refers to a medium or intermediary, is "media." The expression "media" alludes to different exercises or organizations, for example, attractive capacity media, heat move media, and message conveyance media. The terms "educational media" and "learning media" come from the use of the word "media" in education and teaching. Educational media or learning media can be defined in several ways. According to Rossi and Breidle (1966:3), learning media include things like books, magazines, radio, and television that can be used to accomplish instructional objectives. According to Rossi, educational media like radio and television become learning media when used and programmed for education .

Specifically, learning media has the following purposes: a) Representing specific objects or events: Important events or rare objects can be captured in the form of photos, films, or audio and video recordings, which can then be stored and used whenever needed; b) Transforming situations, events, or specific things: With the help of learning media, teachers can transform abstract content into concrete content that is easily understood and free from verbosity. Additionally, learning media can assist in presenting objects that are too small to be seen with the naked eye or too large to be displayed in the classroom; c) Enhancing students' enthusiasm and inspiration: The use of media can enhance students' learning inspiration, allowing their attention to be more expanded towards the learning material.

Any form of learning media that is used to convey messages or information that is beneficial and serves a learning purpose is considered as learning media. Meanwhile, according to Tafonamo [7], learning media is anything that can be utilized to convey the sender's message to the receiver, thereby evoking reflection, sentiment, consideration, deliberation, and student interest in learning, as stated by [8], learning media is an instructional aid for educators to deliver instructional materials, enhance students' imagination, and improve students' judgment in educational experiences.

Non-projected media, projected media, audio media, motion media, computer media, multimedia computers, hypermedia, and distance media are all common types of media utilized in learning, according to [9]. The following are examples of learning media: a) Pictures, photos, graphs, charts, diagrams, cartoons, posters, and comics are examples of graphic media; b) Three-layered media, which are media as strong models, sectional models, gathering models, working models, and lifelike models; c) Slides, film strips, films, and projection media like overhead projectors (OHP); d) The use of the environment as a teaching tool. Non-projected media, projected media, audio media, motion media, computer media, multimedia computers, hypermedia, and distance media are all common types of media utilized in learning, according to [9]. The following are examples of learning media: a) Pictures, photos, graphs, charts, diagrams, cartoons, posters, and comics are examples of graphic media; b) Three-layered media, which are media as strong models, sectional models, gathering models, working models, and lifelike models; c) Slides, film strips, films, and projection media like overhead projectors (OHP); d) The use of the environment as a teaching tool.

Learning media that are suitable for technological advancements are expected to overcome student boredom during the physics learning process. Media in learning serves as a tool to clarify the

messages conveyed by the teacher. Computer-based learning media, including the use of animation, is one of the media that meets the current needs of students, as it helps generate interest and engagement in physics learning materials taught by the teacher.

Physics education not only enhances students' cognitive, affective, and psychomotor skills but also requires knowledge of scientific processes, individual skills, and conceptual understanding of physics. Therefore, understanding physics concepts as the representation of learning outcomes becomes crucial. Physics, as a science subject, is often learned through a mathematical approach, which tends to be feared and disliked by children in general. Learning physics is not just about knowing mathematics but, more importantly, students are expected to understand the concepts, express them in physical parameters or symbols, comprehend problems, and solve them mathematically [10].

Continued understanding of physics concepts requires a process. To facilitate the transfer of physics knowledge, various methods, media, and approaches that lead students to master these concepts are needed, ultimately enabling problem-solving in physics.

The quality of physics education is greatly improved by the efforts of physics teachers. To lead a functioning, innovative, successful, and objective situated educating and educational experience, instructors need to plan physical science showing materials well. The syllabus, lesson plans (RPP), teaching materials, and student worksheets (LKPD). The implementation of the teaching process is the implementation of the lesson plans, including introductory, core, and concluding activities. These activities are designed using appropriate methods, diverse teaching approaches, engaging media, and effective evaluation instruments. In the teaching and learning process, teachers still often use teaching materials developed without specific models or strategies. Therefore, teachers need to be able to create appropriate teaching materials in accordance with the current curriculum development, local potentials, and students' characteristics.

Electronic-Based Learning

Electronic-based learning (e-Learning) was initially introduced by the College of Illinois in Urbana-Champaign in 1960, utilizing a computer-assisted instruction framework called PLATO, developed by Professor Wear Bitzer (Sudaryanto, 2010). Since then, e-Learning has continued to evolve. The idea of electronic learning is depicted utilizing different terms, for example, e-Learning, online distance instruction, web based learning, virtual learning, or electronic learning [11]. Dahiya (2016) says that e-Learning is using technology to let students learn whenever and wherever they want.

According to Hartanto (2016), there are at least three important requirements for electronic learning (e-Learning), as follows: a) The use of networks (limited to the internet) for learning purposes; b) Availability of supporting learning services, such as CD-ROMs or printed materials, which can be used by learners; c) Availability of tutor support services to assist learners when they encounter difficulties[12].

In addition, there are several additional requirements, including: a) Organizational and institutional support for e-Learning; b) Positive attitudes of students and teachers towards computer technology and the internet; c) Planning a learning framework that can be accessed and understood by every student; d) An assessment system for monitoring the progress or growth of learners. And e) Feedback mechanisms established by the implementing body.

The idea of learning with computers and networks makes it possible for students to actively participate in the teaching and learning process. This allows the development of knowledge to take place not only in the classroom where the teacher provides one-way instruction, but also outside of the classroom. Through online access to the system, they can continue to communicate anytime and from anywhere. Such a system will not only enhance the knowledge of all students but also facilitate teaching and learning for teachers as computer programs can take over many of their tasks.

A database can also be used to store the outcomes of the teaching and learning process. When revisiting previous teaching and learning strategies to enhance subject presentation, this data can serve as a reference.

The creation of digital media can make use of a variety of cutting-edge technologies, such as displaying media in front of students with the help of an LCD projector by utilizing Adobe Flash and Macromedia Flash software, 3D pageflip professional, Edmodo, and edu-media. Moreover, there are likewise media as Android-based applications like SISTA, appypie, and expanded reality.

Adobe Streak and Macromedia Blaze can assist educators with picturing ideas in effectively fathomable enlivened structures for understudies [13], [14]. These animations can be accessed by students through various applications. When using 3D pageflip professional, teachers can create modules that provide a flipping paper effect similar to a book, making it more realistic [15]. Furthermore, teachers can utilize platforms like Edmodo, edu-media, appypie, and web blogs to share materials, worksheets, and assessment questions [16]–[18]. Edmodo, edu-media, appypie, and web blogs can be accessed by students through the internet. On these platforms, students can access a collection of materials shared by teachers. Additionally, students can also access assessment questions that can be integrated with other platforms like Google Forms. The SISTA application can be used by teachers to conduct evaluations related to students' knowledge improvement [19]. Augmented reality is a medium created using Vuforia software that utilizes codes like QR codes to display images that may not be present in textbooks. Students can access augmented reality anywhere and anytime if they have the QR code.

Science education accounts for 60% of the development of learning media, followed by physics at 18%, biology at 16%, and chemistry at 6%. Supporting the teaching and learning process is the goal of the creation of learning media. In view of the above article survey, a SWOT examination can be directed on the created learning media. According to Rochman (2019), SWOT analysis looks at a company's strengths, weaknesses, opportunities, and threats. SWOT analysis can be used to analyze factors that influence strengths, weaknesses, efforts to improve, and threats that need to be addressed in sustainable management [20]. SWOT analysis is carried out through data collection (internal and external conditions), data analysis, and decision-making [6].

SWOT Analysis of the developed instructional materials:

1. Strengths:
 - a) Helps in delivering difficult subject matter effectively.
 - b) Can be customized to suit the needs of the classroom.
 - c) Can be designed using various models and teaching strategies.
 - d) Includes both tangible and digital media, making students more interested in learning.
 - e) Can be used to enhance specific skills.
 - f) Students' scientific knowledge improves after using the developed media.
 - g) Enhances the ability to view problems from different perspectives.
2. Weakness:
 - a) Lack of support for independent use without a teacher.
 - b) Requires other technologies for access, such as Android, laptops, and internet.
 - c) Developed for topics with easily observable phenomena by students.
3. *Opportunity*:
 - a) Student-centered education: Students participate more actively in classroom instruction.
 - b) Teachers can employ various learning models, approaches, and strategies.
 - c) Students can relate peculiarities in the media to extract ideas in science.
 - d) Students can relate peculiarities in the media to logical regulations. Student-centered learning - Students are more actively engaged in classroom learning.
4. *Threat*:
 - a) Passive students do not gain a good learning experience and understanding of the subject matter.
 - b) Passive students are unable to connect phenomena in the media with abstract concepts in science.
 - c) Limitations of technology such as android devices and laptops for students.
 - d) Limited access to the internet by students.

According to the preceding SWOT analysis, there are a number of flaws in the development of instructional media up to this point. These flaws include the need for additional technologies to access the media, the focus on phenomena that students can easily observe in their daily lives, and the lack of support for independent use by students without teacher guidance. The primary goal of creating informative media is to assist understudies with figuring out troublesome ideas. Some students have limitations in understanding written words and require visualizations. According to the Cone of Experience theory, learning using audiovisual methods and hands-on practice can result in 90% material absorption [21]. Therefore, the development of more effective science instructional media involves the use of interactive multimedia.

In the homeroom, educators consolidate questions that animate decisive reasoning among understudies while utilizing educational media. Enables students to develop the four C skills, which are critical thinking, creativity and innovation, collaboration, and communication [22]. Several recommended learning models in the 2013 curriculum, including Inquiry Learning, Discovery Learning, Problem-Based Learning, and Project-Based Learning, can be aligned with the use of science instructional media in the classroom [23]. The use of instructional media contributes to a reduction in the class's learning speed gap and enhances student learning quality [24]. Additionally, Aripin & Suryaningsih (2019) found that the use of media can lessen the number of communication errors that occur during the learning process [25].

CONCLUSION

Pioneering potential open doors allude to the opportunities to begin and maintain a business that can create benefits. An entrepreneur needs to be able to think creatively and in new ways, as well as be willing to take chances and respond to business opportunities. A tool used in the learning process to clarify teachers' messages is physics instructional media. Computer-based media and animation, two types of instructional media that are in line with technological advancements, have the potential to increase students' interest in studying physics. Electronic-based learning (e-Learning) is the utilization of data and correspondence innovation for adaptable learning. Networking, learning support services, and tutoring are all part of e-Learning. Through e-Learning, understudies can learn whenever and anyplace. The most recent technologies, such as augmented reality, Android-based applications, and animation, can be utilized in the creation of digital media for e-Learning.

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