

Enhancing Entrepreneurship Education with Innovatively Designed YouTube Videos: Evaluating Student Learning and Effectiveness of Youtube Videos as Educational Tools

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Abstract

The use of video media, particularly YouTube videos, has emerged as highly popular and powerful educational tools in higher education due to its ability to provide rich and engaging content that enhances learners' understanding and retention of information throughout the learning process. Much of the current research highlights a need for more active learning strategies to maximize the educational potential of these videos because traditional Youtube videos tend to create passive learning experiences. However, when properly integrated with active learning strategies through innovative video design and development, Youtube videos can enhance student engagement, learning outcomes, and satisfaction. Therefore, this research aims to innovatively design and develop YouTube videos as educational tools and evaluate students' perceptions of their learning and the effectiveness of the video design and development in higher education involving 20 graduate students in the entrepreneurship education program. The data were analyzed using mean, standard deviation, and content analysis techniques. The findings showed that the innovatively developed Youtube videos were perceived to be highly appropriate (Mean= 4.52, S.D. = 0.13). Students reported that they learned entrepreneurship more effectively from various scenarios filled with choices and challenges in entrepreneurial paths. They also perceived the effectiveness of Youtube videos as educational tools to be very high (Mean= 4.58, S.D. = 0.72), noting that these videos were effective tools that promotes active and experiential learning experiences. In conclusion, this study indicates that Youtube videos, when innovatively designed and developed as educational tools with active learning strategies, can be implemented as a powerful tool in teaching entrepreneurship.

Keywords: entrepreneurship education, Youtube videos, student learning, effectiveness, educational tools

1. Introduction

Video media is widely regarded as one of the most popular, and powerful educational tools, that can capture, distribute and present information, provide students with rich and engaging content, enhance their learning process, and offer a stimulating learning environment, ultimately helping learners gain a clearer understanding and retain information for a longer period (Fern et al., 2011; Brame, 2016; Pérez-Torre- grosa et al., 2017; Owusu-Agyeman & Larbi-Siaw, 2020; Tawaqal & Rizqyan, 2023). Educators can incorporate this type of media into classroom instruction, use it as supplementary material for post-class review, or employ it as a replacement for in-person lectures in remote learning environments (Murray et al., 2015; Henderson et al., 2017; Kleftodimos & Evangelidis, 2018).

With technological progress facilitating video viewing, a video-based learning environment has become more prominent in today's higher education (Calandra et al., 2009; Chatti et al., 2016). According to Jackman (2019), video-based learning is a new digital resource that can be integrated into modern higher education pedagogy., providing an environment where videos are employed for various learning purposes. This is further strengthened by active learning strategies that use innovative video design and development, resulting in an effective approach that can complement and partially replace traditional learning methods. Learning is achieved through instruction delivered via videos (Sablíć, Mirosavljević, & Škugor, 2020) by using visual components as the main information source and audio elements to further explain the content (Majumdar, 2017), with the goal of engaging learners, deepening their understanding, and enhancing their problem-solving abilities in aspects of

personal life, work life, and study life (Wang, Gray, & Meister, 2014) while also improving their learning outcomes and satisfaction (Yousef et al. 2014).

One approach to incorporating videos in the classroom is utilizing YouTube videos (Yuen & Yuen, 2021), which have significant educational potential (Godwin et al., 2017), has been increasingly attracting significant interest from teachers (Maziriri, Gapa, & Chuchu, 2020) and has gained widespread popularity for educational videos among students (Rat für Kulturelle Bildung, 2019). As a leading video-sharing platform, Youtube offers potential for its educational videos, either by using existing videos or making new ones by utilizing its available functions to design and develop in an innovative way to better serve specific learning purposes. This platform makes it easy to watch videos at any place and at any time (Kohler & Dietrich, 2021), upload new content (Chintalapati & Daruri, 2017), give additional processing time to accommodate personal learning preferences (Brecht & Ogilby, 2008), accommodate learning pace, and be used as a complementary learning resources for educators (Alkhawaldeh et al., 2022). Most importantly, it provides free access to substantial number of educational videos (Buzzetto-More, 2014). Therefore, YouTube videos are commonly used as educational tools for teaching and learning (Smith, 2011; Schaper et al., 2014). They are seen as an innovative learning technology by the majority of students (Roodt & Villiers, 2011) and an effective way of supporting student learning (Tan & Pearce, 2012). As a result, when incorporating YouTube videos as educational tools into classrooms, students showed increased attention (Love, Park, & DeBose, 2011), engagement (Clifton & Mann, 2011), learning (Almurashi, 2016), academic performance (Orús et al., 2016), and satisfaction (Alon & Herath, 2014).

However, educational videos achieve their highest effectiveness when they integrate active learning strategies, such as prompting students to pause the video and respond to questions before continuing with the rest of the content (Hakk et al., 2011, Freeman et al., 2014, Brame, 2016). Currently, Youtube videos enable only basic interactions such as play, pause, and linking to other videos. This creates a passive learning experience for learners, as their videos are primarily linear and viewing remains passive unless innovatively redesigned to be interactive (MacWilliam, Aquino, & Malan, 2013; Kleftodimos & Evangelidis, 2018). By using available functions to innovatively develop Youtube videos in a way that requires students to actively engage with the video content, educators can create active learning activities that play a critical role in their learning outcomes (Karppinen, 2005).

Due to the significant educational potential of YouTube videos, particularly within higher education in Thailand, along with the scarcity of research on innovative methods for video viewing, this study seeks to investigate innovative ways of utilizing YouTube videos as educational tools to enhance teaching, improve student learning, and study the effectiveness of this instructional method. By doing so, the findings of this study will contribute to the existing empirical evidence and the broader body of knowledge regarding the use of Youtube videos as educational tools.

2. Objectives

The main objectives of this research were to innovatively design and develop YouTube videos as educational tools, study students' perceptions of their learning, and evaluate the effectiveness of the video design and development in the setting of higher education.

3. Method

The researcher used a quasi-experimental research design with mixed methods, making the research an exploratory study aimed at gaining valuable insights into the use of YouTube videos as educational tools to enhance student learning, as well as evaluating the effectiveness of video design and implementation in an innovative way. The quantitative research focused on utilizing YouTube videos innovatively as educational tools, leveraging their available functions. The qualitative research was concerned with experts' recommendations towards the innovative design and development of Youtube videos as educational tools, students' perceptions of their learning, and recommendations towards the effective use of Youtube videos as educational tools. The research was conducted using two phases according to research objectives: 1) the innovative design and development of YouTube Videos as educational tools and research instruments, and 2) the implementation of videos, the assessment of student learning, and the overall effectiveness of the videos. The details were as follows:

Stage 1: Innovative design and development of YouTube videos as educational tools and research instruments

This stage involved a comprehensive review of existing literature on the use of educational tools, particularly YouTube videos, to identify best practices and examine the functions YouTube offers for better designing and developing videos as educational tools. Additionally, this stage focused on developing research instruments to

collect data aligned with the research objectives.

Stage 2: Implementation of videos, the assessment of student learning, and the overall effectiveness of the videos.

In this stage, before implementation, three experts with expertise and experience in the fields of education and technology verified the videos and all research instruments, followed by a pilot test with 10 non-targeted students. Feedback from the experts and results from the pilot test were collected and analyzed to improve the videos. Subsequently, the revised videos were implemented with 20 graduate students from the entrepreneurship education programme in the higher education context to assess student learning and the effectiveness of YouTube videos as educational tools, using a reflective learning form to identify students' key learning points in entrepreneurship, their application of these points, and their learning through educational tools, as well as a YouTube video effectiveness questionnaire to explore the innovative use of YouTube videos as educational tools.

3.1 Population Overview and Sampling Procedures

This study targeted graduate students enrolled in the entrepreneurship education program at the higher education level, which aims to foster entrepreneurship in both business and educational contexts. As entrepreneurship is a dynamic field that requires the ability to manage both success and failure, it is crucial for graduate students to engage with learning materials that mirror these realities. These materials should immerse them in entrepreneurial journeys, helping them grasp key concepts of entrepreneurship. By encountering real-world scenarios in which they must apply their learning to navigate challenges and seize opportunities, students are able to reinforce the core objectives of the course. This is achieved through the innovative use of YouTube videos, designed to simulate these experiences effectively. The research sample comprised 20 graduate students chosen using a purposive sampling technique. They were selected because they were registered in the researcher's course and had access to the assigned YouTube platform, which was used to deliver active learning activities on entrepreneurship in this study. Participants were notified that they could withdraw from the study at any time without facing any consequences. The learning purpose was to introduce students to the factors contributing to the success and failure of businesses based on the choices and challenges made by entrepreneurs.

3.2 Instruments

A series of 13 interconnected YouTube videos were innovatively designed, based on literature review on the use of educational tools—particularly YouTube videos and its available functions for learning purposes. These videos were created to explore the factors contributing to the success and failure of businesses, with a focus on the choices and challenges made by entrepreneurs. By portraying both success and failure in these scenarios, the series encouraged graduate students to view failure as a learning opportunity, positioning entrepreneurship as a journey. This approach motivated students to reflect on each scenario and its outcomes, preparing them for real-world challenges in business environments. This aligns with the course's goal of shaping graduate students into adaptable entrepreneurs, who are capable of thriving in diverse situations. Each video in the series used YouTube's end screen feature, which added interactive elements in the final 5-20 seconds. In this design, two end-screen elements were incorporated into each video, giving viewers a choice between two entrepreneurial decisions. This structure aimed to assess how interactive videos influenced student learning by connecting each video to the next, creating cohesive entrepreneurial pathways. All videos were produced in .MP4 format, ensuring high quality and compatibility across most devices. Three experts with expertise and experience in the fields of education and technology evaluated the videos using a suitability questionnaire, developed from key elements of effective YouTube videos. This questionnaire featured a 5-point Likert scale (from lowest to highest) and an open-ended question for additional refinement suggestions. A score of 3.51 or higher on this scale was deemed acceptable for the videos. Other data collection instruments included a reflective learning form to gain deeper insights into students' perceptions of their learning, and a YouTube video effectiveness questionnaire based on key elements of effective YouTube videos to assess their use as educational tools in teaching entrepreneurship. The reflective learning form included three open-ended questions: 1) What did you learn from the YouTube videos? 2) How can you apply your key learning points to real life? 3) To what extent do you like using this type of teaching for entrepreneurship? These questions allowed students to reflect on their learning, while the YouTube video effectiveness questionnaire included nine items on a 5-point Likert scale and an open-ended question for recommendations that could not be captured by the scale. The index of item-objective congruence (IOC) for both instruments ranged from 0.67 to 1.00, based on expert evaluations. A pilot test with 10 non-targeted students yielded reliability coefficients of 0.96 and 0.92, respectively. Based on the pilot study results and expert feedback, the research instruments were validated as suitable for use with the targeted group.

3.3 Data Collection

The researcher, serving as the instructor, assigned graduate students from the entrepreneurship education program to watch a series of 13 interconnected YouTube videos. After completing the series, students were requested to evaluate their learning using a reflective learning form and to evaluate the YouTube videos' effectiveness as educational tools using a YouTube video effectiveness questionnaire. Finally, all research instruments were thoroughly checked for completeness and accuracy before data analysis was conducted.

3.4 Data Analysis

Data were collected from all research instruments and analyzed using mean, standard deviation, and content analysis. The quantitative analysis involved calculating the average and standard deviation to interpret the data. For qualitative analysis, the process included reducing and organizing the text by identifying, coding, and categorizing it into themes related to student learning and recommendations for the use of YouTube videos as educational tools.

4. Results and Discussion

The findings of this research were given below:

4.1 The Development of Youtube Videos as Educational Tools

The researcher developed a series of 13 interconnected YouTube videos as educational tools with specific objectives aimed at understanding core concepts of entrepreneurship, applying these concepts in real-world scenarios, and utilizing YouTube videos as educational tools for teaching entrepreneurship, aligning with the entrepreneurship education program's goal of fostering entrepreneurship in both business and educational contexts within higher education. The learning outcomes included demonstrating an understanding of entrepreneurship concepts through various video scenarios, applying these concepts in practical work situations, and effectively using YouTube videos as educational tools in teaching entrepreneurship. These learning objectives and outcomes were carefully aligned with the research objectives to ensure they were achieved. A series of 13 interconnected YouTube videos was then created, each was centered around core concepts of entrepreneurship and incorporating active learning activities. The videos depicted the journey of an entrepreneur who continually faces business decisions that lead to potential successes or failures. Each video was designed to reflect these entrepreneurial journeys, showcasing scenarios where entrepreneurs encounter multiple choices and challenges. Wrong decisions represent failures and setbacks, while correct decisions lead to successes and achievements. The videos utilized YouTube's two-end screen feature, offering viewers a choice between two different entrepreneurial decisions, each enhanced with text, graphics, and sound effects. The researcher logged into her YouTube Studio account and uploaded all the prepared videos, each lasting at least 25 seconds to meet the end screen feature requirements. Next, she navigated to the Content section on the left-hand menu and selected the previously uploaded video by clicking on its thumbnail. She accessed the End Screen option and selected Add Element, choosing to link two videos to the end screen. She arranged the start and end points of the videos in the timeline below the video preview to make them appear interconnected as a series depicting the journey of an entrepreneur. After previewing the end screen for any necessary adjustments, she saved the changes to apply the end screen to the uploaded videos. Examples of Youtube videos were shown in Fig. 1.

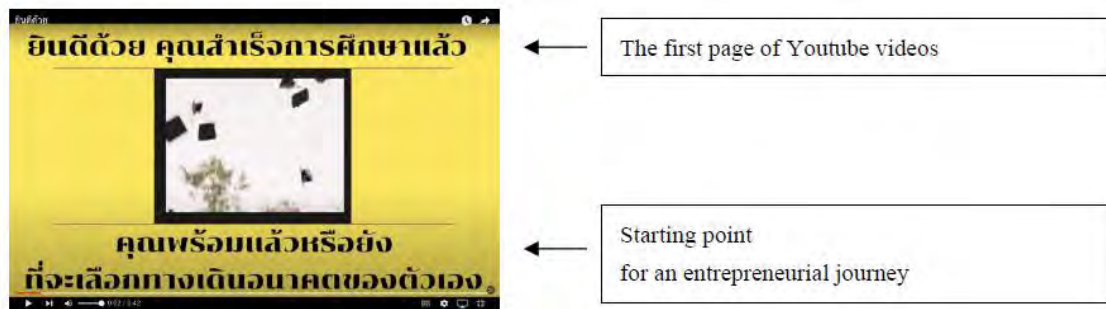


Figure 1. Examples of Youtube Videos as Educational Tools

Figure 1 presents examples of videos from YouTube that were utilized as educational tools. These videos were offered to graduate students in the entrepreneurship education program as part of the researcher's course. These videos were part of an entrepreneurship learning exercise. A review process was conducted by three experts with

extensive experience and expertise in education and technology to evaluate the videos for their entrepreneurship educational content, educational value, and video quality. Three experts were tasked with reviewing a series of 13 interconnected YouTube videos and providing recommendations for necessary changes before implementation with the target group. Their insights aimed to ensure the content was both effective and aligned with best practices in entrepreneurship education. The expert evaluations yielded very positive results (Mean = 4.52, S.D. = 0.13). The mean score for educational content was 4.67 with a standard deviation of 0.00, indicating a very high level of content relevance to entrepreneurship education. The educational value of the videos received a mean score of 4.56 with a standard deviation of 0.19, suggesting that the experts found the videos to be highly valuable educationally. Lastly, the educational video quality was rated with a mean score of 4.33 and a standard deviation of 0.33, reflecting a high level of video quality for learning purposes. The experts recommended incorporating a true story of an entrepreneur as the central case, presented in a storytelling format with an engaging narrative and compelling delivery. Additionally, the videos that were developed were trialed with a small group of students who were not part of the target population to gather preliminary feedback. This feedback was positive and led to adjustments, including adding more storytelling elements, reducing texts, and incorporating more graphics and sound effects, before implementing the videos with the targeted group. The necessary modifications were carried out to improve the YouTube videos considering all feedback, pilot test results, and expert recommendations.

4.2 Students' Perceptions of Learning

Students received a link to access the initial YouTube videos, which served as the starting point of their entrepreneurial journey. This exercise was framed as a narrative where students, having graduated from the entrepreneurship education program, faced decisions that would shape their paths as entrepreneurs. Figure 2 illustrates two video options—one on the left and one on the right—each representing a different trajectory leading to either success or failure in their entrepreneurial endeavors.

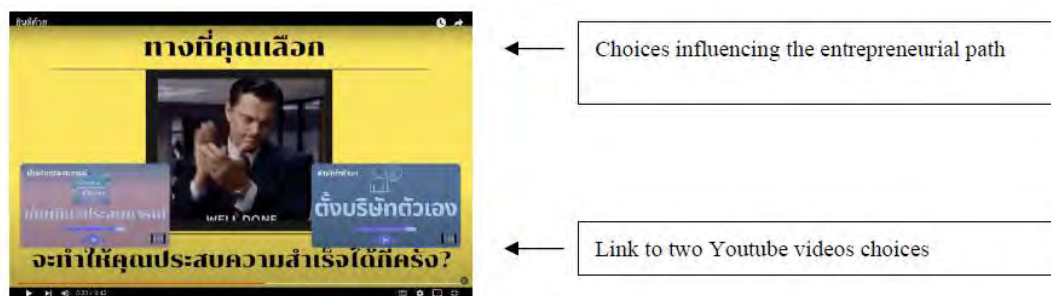


Figure 2. Examples of Youtube Videos Augmented with Active Learning Activities

After engaging with the videos, students were asked to reflect on their learning and the insights gained from this active learning activity. They provided feedback on their perceptions of learning after participating in the entrepreneurial journey using YouTube videos as educational tools. Their reflections were as follows:

Question 1: What did you learn from Youtube videos?

Key Learning Points of Core Concepts of Entrepreneurship:

Graduate students highlighted several important key learning points regarding core concepts of entrepreneurship. They learned strategies that can lead to success in challenging decision-making situations, understanding which choices result in success and which lead to failure. For example, one graduate student stated that

“I learned which choices led to success and which to failure.”

They also recognized that entrepreneurs must possess certain qualities, such as resilience, risk-taking, dedication, determination, and patience, to navigate the challenges that may lead to either success or failure. For example, one student stated that

“Entrepreneurs must possess certain qualities to overcome challenges and achieve success”

Encountering various scenarios was seen as an inevitable and experiential part of the entrepreneurial path, and they emphasized the importance of being prepared for these challenges and experiences ahead. For example, one graduate student stated that

“The entrepreneurial path is an experiential process that requires preparation for the challenges and experiences ahead”

They also acknowledged that failure is not the end of a business venture; instead, it offers a learning opportunity to restart and achieve different outcomes. For example, one graduate student stated that

“There is always an opportunity to come back; failure is not the end of a business if we learn from it”

Decision-making involves both successes and failures, and it's crucial to accept the results and continue striving for success, even after experiencing setbacks. For example, one graduate student stated that

“Decision-making involves both success and failure. Accept the consequences and move forward”

Lastly, they understood that the life of an entrepreneur is filled with situations requiring constant and appropriate decision-making. For example, one graduate student stated that

“Entrepreneurial life is filled with various situations. Different actions lead to different outcomes”

Graduate students frequently reflected on the dynamic nature of entrepreneurship, describing it as a journey of navigating both successes and failures. Many of them expressed that these experiences offer valuable learning opportunities. This indicates a common mindset among students: entrepreneurship is seen as a continuous process of experiential learning, where setbacks contribute to personal and professional growth. Their reflections also revealed an understanding that different actions lead to different outcomes, illustrating how decision-making plays a pivotal role in entrepreneurial success. Preparation for challenges and learning from the experiences of other entrepreneurs are therefore crucial. These insights suggest that students are internalizing the concept of adjusting strategies based on past experiences and anticipating future challenges based on the experiences of others.

Question 2: How can you apply your key learning points to real life?

Application of Key Learning Points in Core Concepts of Entrepreneurship:

Graduate students emphasized the importance of continuously seeking experiences to enhance their understanding of entrepreneurship and to learn how to successfully start and run a business. They also discussed how to apply these key learning points to real-life entrepreneurial endeavors. For example, one graduate student stated that

“Apply entrepreneurial skills and seek out experiences to maximize learning”

They highlighted the value of scenario planning to anticipate challenges that entrepreneurs might face and to prepare accordingly. Additionally, they stressed the need to be ready to tackle the problems and obstacles that arise in business operations. For example, one graduate student stated that

“Consider various business scenarios in advance to better prepare for them”

Learning from the experiences of other entrepreneurs was also seen as a valuable strategy, reducing the need to rely solely on personal trial and error. For example, one graduate student stated that

“Learn from the practices of other entrepreneurs to increase the likelihood of success and reduce the chances of failure”

They recognized the necessity of adapting the strategies that lead to success or failure to fit their specific contexts, as entrepreneurial environments differ from one individual to another. For example, one graduate student stated that

“Entrepreneurial environments vary; adapt your approach to fit your specific context”

Lastly, they underscored the importance of developing key personal qualities that contribute to effective and efficient business management in the role of an entrepreneur. For example, one graduate student stated that

“Develop personal qualities that support your effectiveness as an entrepreneur”

Graduate students repeatedly emphasized the importance of scenario planning and learning from the experiences of others as essential strategies in entrepreneurship. Their reflections suggest a proactive mindset, wherein they aim to mitigate risks by anticipating potential business challenges and preparing accordingly. Additionally, they recognized that entrepreneurship is not a uniform process—one size does not fit all. Many students reflected on the necessity of adapting to specific environments and contexts as a critical factor in achieving entrepreneurial success. These findings reveal how students are internalizing the concept of applying theoretical concepts to real-world entrepreneurial settings, and recognizing the value of learning from both their own and others' experiences.

Question 3: To what extent do you like using this type to teach entrepreneurship?"

The use of Youtube videos as educational tools in teaching entrepreneurship:

The entrepreneurship education program has a dual focus: learning about entrepreneurship and learning how to teach it. Consequently, graduate students are expected to not only gain knowledge about entrepreneurship but also develop the skills to teach it effectively. It is therefore important for them to assess YouTube videos as educational tools for teaching entrepreneurship to understand how these videos can be used to convey entrepreneurial concepts and practices effectively.

Most of graduate students (16 students) provided positive feedback on the use of YouTube videos as educational tools, highlighting their excitement and engagement in their learning process. They appreciated the active learning approach, which encouraged critical thinking and participation, and valued the innovative, non-traditional method of learning. Despite the shorter duration, students felt they learned a lot, praising the efficient and interesting design. The videos were considered easy to understand, fun to learn from, and required active decision-making, which enhanced their overall learning. A sample of students' feedback is shown below:

"The learning design, like watching and interacting, was found to be interesting, entertaining, and engaging."

"The videos required active participation, as students had to think critically and make difficult decisions throughout the learning process."

"Despite the short duration, the videos provided a substantial amount of learning."

However, four graduate students provided negative feedback for improvement. They provided some constructive criticisms of their learning experience from Youtube videos, noting discomfort with the unfamiliar learning design and the fast pace, which made timely decision-making difficult. They also expressed a desire for more interaction, such as the ability to ask questions and seek additional information. Additionally, some felt that the focus on success in the learning activities did not adequately reflect real-life scenarios where failure is also a possibility. A sample of students' feedback is shown below:

"I am not familiar with learning through YouTube videos in this manner."

"I need a teacher present to ask questions, get more information, and seek guidance."

"The focus is solely on success, but in reality, entrepreneurs often experience failure."

Graduate students generally provided positive feedback regarding the use of YouTube videos, describing the format as engaging and conducive to active learning. They emphasized that the interactive elements within the videos allowed for greater involvement, encouraging them to participate actively in the learning process. This reflection suggests that they view the format as effective in promoting a hands-on approach to entrepreneurship education, enhancing their critical thinking and decision-making skills. However, several students expressed discomfort with certain aspects of the YouTube-based learning design. Those who felt uneasy with the fast pace or found the design unfamiliar highlighted a need for additional time and space to reflect on the content. This feedback suggests that while the format is largely effective, it may require adaptations to better accommodate different learning paces. The notion that YouTube-based learning can be challenging for some students reflects a diversity of learning preferences, with some needing more time for thoughtful reflection to fully grasp the material. Moreover, students pointed out that the focus on success in the videos did not accurately mirror the realities of entrepreneurship, where failure is often a critical part of the process. This critique indicates that integrating narratives around failure and setbacks in the entrepreneurial journey could provide a more realistic and comprehensive understanding of the challenges entrepreneurs face. By incorporating these perspectives, the videos could offer a more balanced depiction of entrepreneurship, aligning more closely with students' expectations of learning from both successes and failures in their entrepreneurial pursuits.

4.3 Students' Perceptions of Youtube Videos' Effectiveness

Graduate students were given a YouTube video effectiveness questionnaire to assess their use as educational tools in teaching entrepreneurship after completing a series of 13 interconnected YouTube videos. Table 3 illustrates students' perceptions of the effectiveness of YouTube videos as educational tools for teaching entrepreneurship.

Table 3. Mean and Standard Deviation of Students' Perceptions of YouTube Videos' Effectiveness

Students' Perceptions of YouTube Videos' Effectiveness	<i>M</i>	<i>SD</i>	Interpretation
Content of Entrepreneurship			
1. Content is appropriate for learners' level	4.50	0.69	High
2. Content is appealing	4.50	0.83	High
3. Content is relevant to entrepreneurship	4.50	0.69	High
Content Presentation as Entrepreneurial Path			
4. Choices are consistent and coherent in content	4.70	0.47	Very high
5. Different choices lead to different content	4.70	0.66	Very high
Content Delivery on Youtube platform			
6. Learners consistently interact with the video content through YouTube's end screen feature.	4.60	0.68	Very high
7. Learners remain actively engaged in the decision-making opportunities presented throughout the video content.	4.40	0.82	High
8. Learning activities are simple and easy to understand without needing additional explanations	4.89	0.32	Very high
9. Learning challenges leading to different outcomes, reflecting success or failure from the choices made	4.40	1.05	High
Total	4.58	0.72	Very high

Table 5 illustrates that the perceived effectiveness of YouTube videos as educational tools was rated at a very high level (Mean = 4.58, S.D. = 0.72). Students perceived the effectiveness of YouTube videos in delivering entrepreneurship content as high (Mean = 4.50, S.D. = 0.67). The effectiveness of content presentation as an entrepreneurial pathway and content delivery on the YouTube platform were perceived at very high levels (Mean = 4.70, S.D. = 0.52, and Mean = 4.56, S.D. = 0.61, respectively). Students found this approach to be an active learning experience, recognizing it as a dynamic yet easy-to-understand new type of learning activity. They also viewed YouTube as an interesting learning platform that can support learning activities in an innovative way. Some of the graduate students expressed the following:

"YouTube videos can be used as an active learning activity, stimulating the practice of entrepreneurship in various scenarios"

"I like this active learning approach. It involves experiencing and practicing through various scenarios"

"A new way of using YouTube as an educational tool, serving as a learning platform that can incorporate learning activities in an innovative way"

Graduate students unanimously recognized YouTube videos as effective active learning tools that stimulate their engagement in entrepreneurial practices. The videos foster an environment where students can immerse themselves in various scenarios, thereby enhancing their practical understanding of entrepreneurship. They noted that using YouTube introduces a fresh perspective on learning, enabling the integration of interactive elements that facilitate a more engaging and effective learning experience. By experiencing and practicing through various scenarios presented in the videos, they feel better equipped to navigate the entrepreneurial landscape. This suggests a significant alignment between educational content and the skills needed for real-world entrepreneurship, emphasizing the importance of practice-based learning.

However, they recommended adding more entrepreneurship content to extend the entrepreneurial path, providing more than 2 choices and including challenging scenarios to increase engagement and reflect real-life dynamic situations. They also suggested allowing more time for content absorption and reflection, and facilitating the exchange of experiences and outcomes among other graduate students. Some of the graduate students expressed the following:

"Real-life situations are full of exciting and challenging choices, not just two options"

"The life of an entrepreneur is a long journey toward success"

"Time is important; you can't rush learning"

"Sharing learning points between students will be beneficial"

Graduate students underscored that real-life entrepreneurial scenarios are often multifaceted, characterized by a range of exciting and challenging choices. This acknowledgement reflects a deeper understanding that

entrepreneurship involves navigating a spectrum of decisions that can lead to various outcomes. The recognition of this complexity suggests that effective entrepreneurship education should prepare students for a variety of potential paths and outcomes, reinforcing the importance of adaptability and critical thinking in real-world contexts. Understanding entrepreneurship as a journey rather than a destination may encourage students to embrace challenges and setbacks as integral parts of their development. However, students emphasize that genuine understanding requires adequate time for reflection and assimilation of knowledge. This insight points to the necessity for educators to design learning experiences that allow for deeper exploration of concepts, as well as the importance of pacing in curricula to avoid superficial learning outcomes.

The main findings indicated that when YouTube videos were augmented with active learning strategies, such as offering viewers choices that would influence their path as entrepreneurs when facing challenges in business, viewers became active participants, not just passive observers. This interaction with the video content throughout their learning process—facilitated by innovative design and development using YouTube's features, such as the end screen—proved to be an effective learning method, leading to better learning outcomes. These findings align with Kohter & Dietrich (2021), who found that passive viewing, where viewers consume content without active engagement, can hinder deep thinking and reflective learning, which are essential components of effective education. Pre-existing YouTube videos that were not designed and developed for specific learning purposes lack interactive elements that encourage active learning. Innovatively redesigned YouTube videos, by utilizing their available functions, can provide more active and engaging learning experiences. This reflects a broader trend in educational theory, which increasingly values learning experiences that simulate real-world challenges and decision-making processes (Ratten & Jones, 2018). It also aligns with recent educational theories that advocate for experiential and active learning approaches, which are believed to be more effective in preparing students for the uncertainties of entrepreneurship (Neck et al., 2020).

Moreover, high ratings and detailed feedback from experts were pivotal in ensuring the effectiveness of the video design and development. The adjustments made based on their recommendations were essential in refining the videos, making them more suitable, practical, and impactful for graduate students, ultimately promoting the desired learning outcomes. The process of validating video content through expert input should, therefore, be considered a fundamental part of the design and development phase, ensuring that improvements are grounded in expert-backed evidence before implementation.

According to Brame (2016), one of the key elements for video design and implementation in moving learners towards the desired learning outcomes is active learning, which provides a solid base for the development and use of videos as an effective educational tool. In this study, videos designed and developed with active learning strategies helped graduate students grasp the core concepts of entrepreneurship. They highlighted the importance of strategies for success, resilience, risk-taking, and adaptability, especially when facing setbacks in their entrepreneurial journey. Students recognized that entrepreneurship is experiential and requires thorough preparation for various challenges encountered in business. Key learning points included the inevitability of facing diverse scenarios and the role of failure as an opportunity to learn, restart, and pursue success. To apply these lessons effectively, graduate students emphasized the importance of continuous learning, scenario planning, and learning from the experiences of successful entrepreneurs. They also noted the need to adapt strategies to individual contexts and develop essential personal attributes for successful business management. These results were consistent with Golchai et al. (2012) and Malhotra & Verma (2020), whose findings indicated that multimedia, like videos, improved students' learning outcomes compared to traditional teaching methods. This is also in line with Noetal et al. (2021), who investigated how student learning was affected by videos in higher education; their findings indicated that videos frequently improved learning outcomes. Moreover, better learning outcomes were associated with tailor-made content produced by the researcher (as an instructor), rather than using pre-existing YouTube videos that were not specifically designed and developed to serve the entrepreneurial path.

Additionally, the findings indicated that graduate students perceived YouTube videos as effective educational tools for delivering entrepreneurship content, recognizing their potential for active and experiential learning when well and creatively designed. They felt positively about using YouTube videos as educational tools. Therefore, YouTube videos can be served as a powerful tool for teaching entrepreneurship in an interesting and innovative manner. These findings align with Yousef et al. (2014), who stated that YouTube videos are a powerful model for improving learning outcomes and student satisfaction, and with Masats & Dooly (2011), who demonstrated that using video for educational purposes introduces innovative and creative teaching perspectives. According to Alwehaibi (2015) and Jones & Cuthrell (2011), students' learning outcomes are improved by integrating videos into instruction. The findings also conform with Flores et al. (2013), who

asserted that the effect of videos was superior to other learning resources. Tawaqal & Rizqyan (2023) suggested the inclusion of educational media as a valuable part of teaching and learning to create an engaging and effective learning environment, thereby increasing the productivity and dynamics of learning. Smith (2019) also suggested that integrating media into entrepreneurship education can better prepare students for the complexities of entrepreneurial ventures. Moreover, the findings helped instructors discover a new way of using YouTube videos as educational tools and provided strong evidence on how to use YouTube videos to enhance active learning for better learning outcomes. This aligns with Klefodimos & Evangelidis (2016), who emphasized the importance of integrating interactive elements into educational videos, and Vural (2013), who indicated that videos should be designed to engage students in the learning process through interactive activities. However, Maziriri, Gapa, & Chuchu (2020) reminded that effectively using videos requires effort and planning on the part of instructors, who must creatively use the available functions to innovatively design and develop effective educational videos for multiple engaging ways to enhance learning experiences.

5. Conclusion and Recommendation

The findings of this research indicated that Youtube videos had positive impact on student learning and students recognized its effectiveness when using as educational tools in teaching entrepreneurship. With its high potential if effectively designed and developed in an innovative way, it can be implemented as a powerful tool to teach entrepreneurship. Students recognized that the entrepreneurial journey is experiential and requires thorough preparation for various challenges in various situations faced in the life of entrepreneurs.

However, this study was conducted with a small sample size, which restricts the ability to draw definitive conclusions about the effectiveness of teaching and learning through YouTube videos. While the findings provide preliminary insights, they cannot be generalized to a broader population. Extending the research to include a broader group of students would enhance our understanding of the effectiveness of YouTube videos in teaching entrepreneurship, thereby improving the generalizability of the findings. Additionally, incorporating more complex and extended learning designs could further investigate the outcomes on a larger scale. However, a small subset of graduate students expressed concerns. This suggests that while the use of YouTube videos in the learning process is generally effective, it may not fully address the diverse preferences and learning needs of all students, indicating some limitations in the current video design and development. Given the diverse needs and preferences of students when using YouTube videos as educational tools, future studies should explore the impact of adding more complexity to scenarios and extending them into longer series to enhance entrepreneurial skills. This approach could better prepare students for the complexities of real-world entrepreneurship. Additionally, offering more flexibility for deeper reflection on the content would help cater to a broader range of learning styles and preferences.

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Authors contributions

The author was responsible for conducting the research and wrote the manuscript. She read and approved the final manuscript.

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Data sharing statement

No additional data are available.

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