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Effectiveness of YouTube Videos in Learning Database Courses among University Students

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Abstract: This research explores the effectiveness of YouTube videos as supplementary resources for students studying database subjects. With the growing use of digital media in education, it is vital to understand how these resources impact learning outcomes. Using a mixed-methods approach, the study collects quantitative data through surveys and qualitative insights through interviews. The results indicate that YouTube videos significantly improve students' understanding, engagement, and retention of database concepts. The study concludes with recommendations for educators on effectively incorporating YouTube into their teaching strategies. This paper investigates the effectiveness of YouTube videos as a learning tool for students studying database subjects. With the increasing availability of online resources, it is essential to evaluate how these resources impact student learning outcomes. The study utilizes a mixed-methods approach, combining quantitative data from surveys and qualitative data from interviews with students. The findings suggest that YouTube videos enhance understanding, engagement, and retention of database concepts, while also providing flexibility and accessibility. Recommendations for educators on integrating YouTube into curriculum design are discussed.

Keywords: *Database Course, Multimedia Learning, YouTube Videos, Higher Education.*

1. Introduction

Several online resources have been adopted as a result of the move to digital education, with YouTube emerging as a crucial platform for educational information. Videos on a variety of topics, including intricate areas like databases, can be found in its vast library. YouTube is becoming a more popular learning tool for students, thus it's critical to evaluate its efficacy, especially in specialized fields. According to Abbas and Qassim (2020), YouTube primarily creates knowledge by providing multimedia educational resources.

The advent of online learning platforms has transformed traditional educational methodologies. YouTube, with its vast repository of instructional content, has emerged as a significant resource for students. This study aims to assess the effectiveness of YouTube videos specifically in the context of learning database subjects, which are often perceived as complex and challenging.

In recent years, the landscape of education has evolved dramatically due to advancements in technology and the increasing accessibility of online resources. YouTube, as one of the largest video-sharing platforms, has become a pivotal tool in the educational domain, offering a vast array of instructional videos across various subjects. With over 500 hours of video uploaded every minute, YouTube has become an indispensable educational tool globally (YouTube, 2022). As the largest video-sharing platform, it provides an accessible repository for learners seeking supplemental content in various subjects, including technical courses like databases. Given the complexity of database concepts, this study seeks to understand the extent to which YouTube videos serve as an effective learning tool among these, database management has emerged as a crucial area of study, essential for students pursuing careers in information technology, data science, and related fields. However, database concepts can be intricate and challenging, often requiring students to grasp abstract principles and complex technical skills.

For students who want to work in data science and information technology, database courses are crucial. However, because of their technical complexity and abstract character, these subjects might be difficult. The purpose of this study is to assess how useful YouTube videos can be as teaching resources in this situation. The following are the main research questions.

How effective are YouTube videos in enhancing students' understanding of database concepts? What are students' perceptions of YouTube as a learning resource? Which characteristics of YouTube videos contribute to their effectiveness? By addressing these questions, this research aims to provide insights to help educators effectively integrate YouTube into their curriculum.

The integration of YouTube videos into the learning process presents an opportunity to enhance student engagement and understanding. Video content allows for dynamic presentations of information, catering to diverse learning styles through visual and auditory stimuli. Previous research suggests that multimedia resources can significantly improve comprehension and retention (Mayer, 2009; Guo et al., 2014). Despite this potential, there remains a gap in the literature specifically addressing the effectiveness of YouTube videos for learning database subjects.

This study aims to explore the effectiveness of YouTube as a supplementary learning resource for students studying databases. It seeks to assess students' perceptions of using YouTube videos, evaluate how these videos impact their understanding and retention of database concepts, and identify specific features that enhance their learning experience. By examining these factors, the research intends to provide actionable insights for educators on integrating YouTube into their curriculum effectively.

Ultimately, understanding the role of YouTube in learning database subjects can help educators tailor their teaching strategies to better meet the needs of their students, thus fostering improved academic outcomes in this vital area of study. As digital resources continue to proliferate in educational settings, this research contributes to a more nuanced understanding of how to leverage online video content to enhance learning experiences.

2. Literature Review

Previous research indicates that multimedia resources can facilitate learning by catering to different learning styles (Mayer, 2009). In particular, video content can enhance engagement and improve comprehension (Guo et al., 2014). However, few studies have examined the specific impact of YouTube videos on database learning, highlighting a gap that this research aims to address.

Multimedia Learning

The impact of multimedia learning has been extensively studied, with Mayer's Cognitive Theory of Multimedia Learning suggesting that combining visual and auditory elements enhances comprehension and retention (Mayer, 2020). Videos, as a type of multimedia, engage learners through dynamic presentations, making complex subjects more accessible (Mayer, 2020). Moreover, according to Guan et al. (2018), numerous studies have demonstrated the value of multimedia technology in education and the broad use of these tools. Technology is typically used in multimedia, and because of its many advantages, multimedia applications are widely used in education (Almara'beh et al., 2015).

The cognitive theory of multimedia learning, which makes three assumptions about how individuals learn from instructional multimedia content, is one theory that must be understood to use multimedia for learning. These presumptions might be expressed as active processing, dual-channel, and limited capacity (Alemdag and Cagiltay, 2018)

YouTube has become a significant educational resource, allowing students to access content flexibly and at their convenience. Research shows that students often prefer video-based learning due to its interactive nature (Berk, 2020). However, challenges remain, such as identifying credible sources amid the vast array of available content (Mackey & Jacobson, 2017).

Visual Aids in Learning Database

Visual learning aids, such as charts, graphs, pictures, and diagrams, have been shown in studies to improve student learning results in a range of settings (Qasserras & Qasserras, 2023). According to Pateşan et al., (2018), several studies have verified that visual aids can enhance the quality of instruction by helping students

retain important information for longer periods, clarifying difficult concepts, and catering to their preferences for visual processing.

In the context of database education, visual aids have been shown to improve understanding (Cheng et al., 2020). Despite YouTube's growing popularity, limited research has focused on its effectiveness in this specific area. This study seeks to address this gap by examining student experiences and learning outcomes related to YouTube videos in database subjects.

3. Methodology

This study adopts a mixed-methods approach, combining quantitative survey data with qualitative insights from interviews. A sequential explanatory design was implemented, collecting survey data first, followed by interviews for deeper insights.

Participants

The participants for this study consisted of 89 undergraduate students enrolled in a database management course at Universiti Teknologi MARA (UiTM) Malacca. The sample was diverse, with students from various academic backgrounds and differing levels of familiarity with database concepts. This variety ensures that the study captures a wide range of experiences and perceptions regarding the use of YouTube videos in learning database management.

Data Collection

Data were collected in two stages.

Surveys: The first stage involved an online survey distributed to all 89 participants. The survey was designed using a structured questionnaire, which included sections on demographics, YouTube usage patterns, perceived effectiveness of YouTube videos, and challenges faced while using the platform. Students rated their learning experiences using a 5-point Likert scale, which measured their level of agreement on various aspects of YouTube's role in learning database concepts. The survey was conducted anonymously to ensure honest and unbiased responses.

Interviews: After the survey, semi-structured interviews were conducted with five volunteers to collect qualitative data. These interviews provided an opportunity to explore the participants' experiences with YouTube videos for learning database concepts in greater depth. The open-ended questions focused on the types of videos the students found most useful, their perceived learning outcomes, and any challenges or limitations they encountered while using YouTube. This qualitative component was crucial for providing context to the quantitative survey results and uncovering additional insights not captured by the surveys.

By using a mixed-methods approach, the study ensures that the results are both grounded in measurable data and enriched with personal experiences, providing a nuanced understanding of the role of YouTube videos in the academic learning process.

4. Results and Discussion

The survey conducted for this study aims to examine the influence of YouTube videos in learning database courses. It is divided into three main sections: demographic information, the frequency and type of YouTube usage, and the perceived effectiveness of YouTube in learning database concepts. The demographic section collects data on the respondents' age, gender, and academic background. The second part explores how often and what types of YouTube videos students use for learning database topics. Lastly, the effectiveness section focuses on how students perceive YouTube videos in terms of understanding, engagement, and retention of course material. Table 1 provides a summary of the demographic information and survey results.

Table 1: Survey questions and results

Question	Option	Result (%)
Section 1: Demographic Information		
Age :	18-24	96.6
	25-34	2.2
	35-44	1.1
	45-54	0.0
	54 and above	0.0
Gender :	Male	43.8
	Female	56.2
Part :	1	41.6
	2	0.0
	3	34.8
	4	0.0
	5	12.4
	6	9.0
	7 and above	2.2
Section 2: YouTube Usage		
How often do you use YouTube for learning database concepts?	Never	21.3
	Occasionally (1-2 times in a week)	32.6
	Sometimes (3-5 times in a week)	33.7
	Often (6-10 times in a week)	12.4
	Always (more than 10 times in a week)	0.0
What type of YouTube videos do you find most helpful for learning databases?	Tutorial Videos	87.6
	Lectures by Professors	60.7
	Real-World Applications	42.7
	Q&A Sessions	25.8
	None	1.1
Section 3: Effectiveness of YouTube Usage		
YouTube videos enhance my understanding of database concepts. (1 = Not likely at all, 5 = Very likely)	1	9.0
	2	6.7
	3	28.1
	4	42.7
	5	13.5
I feel more engaged when learning from YouTube videos compared to traditional lectures	1	11.2
	2	10.1
	3	50.6
	4	22.5
	5	5.6
I retain information better after watching YouTube videos.	1	7.9
	2	9.0
	3	30.3
	4	43.8

	5	9.0
YouTube videos provide relevant real-world examples that help me understand database concepts.	1 2 3 4 5	6.7 9.0 36.0 37.1 11.2
What challenges do you face when using YouTube for learning databases?	Difficulty finding credible sources Overwhelmed by the amount of content Distraction from unrelated videos Difficulty understanding certain topics Other:_____	58.4 47.2 55.1 59.6 2.2

Table 1 provides a detailed summary of these survey results, showcasing trends such as the high preference for tutorial videos and the frequent challenge of finding credible sources. The results also reflect the significant role of YouTube in enhancing students' comprehension and engagement in learning database concepts.

The demographic data indicates that a majority of the respondents (96.6%) fall within the age range of 18-24, which aligns with typical university student populations. The gender distribution is fairly balanced, with 56.2% female and 43.8% male respondents. This provides a representative sample for the target population, making the findings more applicable to a broad student demographic. The varied responses in the “Part” section (referring to the level of academic engagement) suggest that students with different levels of exposure to database subjects participated, adding depth to the survey results.

In terms of how often students use YouTube for learning database concepts, the survey reveals that a majority of students utilize YouTube regularly, with 66.3% using it occasionally (1-5 times a week). This suggests that YouTube is a commonly used supplementary resource in their studies.

Regarding the types of YouTube videos students find most helpful, 87.6% prefer tutorial videos, followed by lectures from professors (60.7%), and real-world applications (42.7%). This highlights that students are seeking both conceptual understanding and practical application in their learning, and they value tutorial-style content that breaks down complex database concepts into digestible formats.

The third section of the survey focuses on the perceived effectiveness of YouTube in learning database concepts. A significant portion of students (42.7%) agreed that YouTube videos enhance their understanding of these topics. Additionally, 43.8% of respondents indicated that they retain information better after watching YouTube videos compared to traditional lecture formats.

However, the effectiveness of YouTube is not without its challenges. 58.4% of students reported difficulty finding credible sources, and 55.1% mentioned distractions from unrelated content. This suggests that while YouTube is a valuable resource, students often struggle with information overload and quality control.

In summary, the results confirm that YouTube is a valuable educational tool for university students studying database courses, though it requires structured use and quality control to maximize its effectiveness. The findings provide a foundation for educators to integrate YouTube videos more effectively into their teaching strategies.

5. Conclusion and Future Research

The findings of this study indicate that YouTube is an effective supplementary tool for enhancing learning in database courses among university students. The use of tutorial videos, in particular, has proven to be beneficial in simplifying complex concepts and improving student engagement and retention. The survey results also

highlight that students appreciate the flexibility and accessibility of YouTube as a learning platform, allowing them to revisit content at their own pace.

However, the study also reveals challenges such as difficulty in identifying credible sources and the distractions caused by unrelated content. These issues suggest the need for structured guidance from educators in navigating the vast amount of information available on YouTube. By incorporating curated playlists or recommended channels into their teaching, educators can help students optimize their learning experiences.
Future research could examine the long-term impacts of YouTube use on academic performance and explore strategies for enhancing the credibility of educational content available on the platform. By leveraging the strengths of YouTube, educators can create more engaging and effective learning environments for their students.

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