

TikTok's Influence on Pharmacy Education: Enhancing Drug Information Mastery through Distance Learning

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Abstract

TikTok, a popular platform for sharing short videos on social media, has not yet been fully explored as an educational tool. This research examines how TikTok has influenced pharmacy education, particularly concerning drug-related learning. The study compared two groups: one utilizing conventional learning methods, such as textbooks and online resources, and the other incorporating TikTok as part of their learning approach. Academic performance was assessed using multiple-choice tests. The findings showed a significant difference in performance between the two groups, with the TikTok-supported group performing better, suggesting that TikTok-based learning can improve educational outcomes. This study provides valuable insights into teaching methodologies and supports the potential of integrating social media-based learning into traditional education settings. This study emphasizes the importance of exploring innovative and engaging strategies to enhance student learning, especially in pharmacy education.

Keywords: Educational innovation, TikTok, Distance learning, Pharmacy education, Social media

Introduction

E-learning represents a contemporary method that merges online education with training, providing individuals the flexibility to learn and receive guidance regardless of time or location. It integrates various learning materials, including lectures, individual or group study sessions, and interactive projects [1].

Social networking sites are digital platforms that allow users to establish private profiles. These profiles enable individuals to share their personal details, interests, hobbies, and passions. One key feature of these platforms is the ability to create connections, or “friends” or “contacts,” enabling interaction with other users. These

online connections facilitate continuous interaction with family, colleagues, friends, and others in a digital space. Social networking platforms allow users to share and exchange media, such as images, messages, videos, and other forms of content. These sites promote social interaction, the exchange of ideas, and participation in group discussions [2].

The usage of social media has surged and is now one of the most frequent online activities. In 2021, there were 4.26 billion active social media users globally, with projections suggesting nearly six billion users by 2027 [3]. East Asia leads the world in terms of mobile social media engagement, followed by regions such as the Americas and Northern Europe. On average, users spend 144 minutes per day on social media and messaging platforms, reflecting a notable increase from the 30-minute average in 2015 [4].

The increasing popularity of social media presents a significant opportunity for educators to harness these platforms and their mobile applications in teaching. Through these platforms, teachers can create innovative, interactive educational experiences that engage students.

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Social media offers an exciting environment for students, encouraging collaboration, sharing information, and engaging in discussions outside the traditional classroom setting. By integrating social media into the curriculum, educators can motivate students to actively participate in class conversations and cultivate a sense of community. These platforms promote cooperative learning by fostering peer connections, sharing resources, and facilitating requests for assistance. Additionally, the multimedia features of social media enable teachers to upload videos, images, and interactive content to enhance the learning experience [5, 6].

Social media also allows teachers to benefit from personalized learning, as these platforms offer resources that provide tailored content, adaptive assessments, and feedback that cater to individual student needs and learning styles. Moreover, social media enhances communication between students, parents, and teachers, promoting knowledge exchange and building a supportive educational community. It also aids in promoting cross-cultural awareness and global understanding by connecting students from diverse countries. By eliminating geographical and cultural barriers, social media fosters intercultural interactions, helping students develop a broader global perspective [7]. Social media platforms allow users to generate and share digital content, contributing to the creation of valuable resources. These platforms promote collaboration and knowledge-sharing among students and faculty, creating an environment where information, opinions, and experiences can be freely exchanged. Students can access specific content related to their areas of interest and participate in group projects, brainstorming sessions, and collaborative discussions, strengthening their sense of community and teamwork [8].

Short video-sharing platforms, which allow users to create and upload brief videos, have become particularly popular among young people on social media. These platforms, often used through smartphone apps, enable users to create, edit, and share videos that typically last from a few seconds to several minutes. The short duration of these videos makes them ideal for spontaneous and quick communication. Their ability to be easily and rapidly shared contributes to their widespread popularity, making them a favored tool for social interaction among the youth [9].

TikTok is one such platform, renowned for allowing users to create and share short videos on a wide array of

subjects. While the platform can be accessed through the web, it is primarily designed for mobile and tablet use. TikTok provides a plethora of creative options, such as filters, stickers, sound effects, voiceovers, and background music, enabling users to produce unique content. Over time, the maximum video length has been extended from 15 seconds to 10 minutes. TikTok recently surpassed 1 billion monthly active users and is poised to outpace Instagram as one of the leading social media platforms. Since its inception, TikTok has outperformed other video and photo apps in the App Store in terms of downloads. The app has transformed the process of video creation and sharing by allowing users to record and instantly share real-time moments from their lives. The short video format requires minimal time and effort to produce and view, resulting in increased user engagement. Upon using the app, viewers are immediately immersed in a continuous feed of captivating and exciting short clips. The autoplay function further enhances user engagement, keeping videos playing in sequence, which often leads users to spend extended periods browsing through random content due to its addictive nature [9, 10].

TikTok, launched in 2016, has rapidly emerged as one of the most widely used social platforms and video-sharing apps globally. By 2021, it boasted around 656 million active users worldwide, with global app downloads peaking at over 834 million by 2023 [4].

Proficiency in drug information (DI) is vital for pharmacists across all clinical environments [11]. Recognizing the importance of these skills, the Accreditation Council for Pharmacy Education [12] mandates that pharmacy programs equip their graduates with the necessary knowledge and abilities to identify, evaluate, and interpret scientific literature to provide accurate and current DI to both patients and healthcare professionals. This requirement ensures that pharmacists are prepared to meet patient needs and collaborate effectively with healthcare teams. Pharmacy schools implement a variety of strategies and active learning opportunities in DI courses to meet the standards set by the ACPE accreditation process. These programs aim to strengthen students' capacity to locate, analyze, and apply drug-related information in real-world scenarios [12].

Simultaneously, it is widely acknowledged that pharmacy education is demanding, as students are required to balance the pressures of academic achievement with the need to maintain their well-being.

The rigorous nature of the program and the expectation to excel both academically and personally can lead to significant stress for pharmacy students [13]. Studies show that pharmacy students experience higher stress levels compared to their non-pharmacy peers [14].

Literature Review

The academic literature thus far has generally ignored the role of TikTok in education. While many studies have explored the use of technology in educational environments, there has been little focus on how TikTok specifically influences learning outcomes and teaching techniques. This gap highlights the need for more in-depth research on the app's educational potential. Investigating its unique features—such as its captivating video format, informal learning atmosphere, and collaborative elements—could shed light on how TikTok could be effectively integrated into educational settings. Despite the lack of extensive research on TikTok's educational advantages, some studies have highlighted its promise. Research that shows positive outcomes points to TikTok's capacity to engage students, aid in vocabulary development, and foster collaborative learning. These studies suggest that TikTok could function as an additional tool to enhance student interaction and comprehension.

Escamilla-Fajardo *et al.* [15] found that using TikTok in corporal expression courses for a sports science bachelor's program brings several benefits. TikTok has been shown to boost student motivation, foster an inspiring learning environment, and help students develop important traits like creativity and curiosity. Because TikTok aligns well with the creative nature of the course and holds the potential for positive educational impact, it is recommended for inclusion in creative expression classes [15].

Looking ahead, TikTok presents an opportunity as a learning tool, offering the ability to deliver short instructional videos in just a few seconds. TikTok's content can be used to create effective e-learning materials, supporting educational strategies centered around nano-learning [16-20].

The results from studies on TikTok's effectiveness provide valuable insights for educators and administrators seeking innovative teaching tools. These findings suggest that incorporating TikTok into English courses can help students improve their writing and speaking skills. TikTok provides a platform for students

to significantly enhance their speaking abilities and grammar [21-23].

Rahmawati and Anwar [24] introduced a fresh approach to teaching vocabulary using TikTok, based on the positive feedback from students. Their research suggests that TikTok could be an effective method for vocabulary acquisition in educational settings.

A study by Reskianissa *et al.* [25] explored TikTok's potential as an innovative tool for improving computational thinking skills in an online learning context. This research targeted 9th-grade junior high school students, showing a remarkable improvement in student performance, with post-test scores averaging 89.3%, a 32.2% increase from pre-test scores. The findings indicate that TikTok can be an efficient and creative educational tool for learning through short videos [25].

Roza *et al.* [26] conducted a qualitative study examining how TikTok influenced students' learning. Their research, involving 30 students, showed that TikTok had a positive effect, with 73.3% of students reporting improved results, 23.3% seeing no change, and only 3.3% indicating a decline in performance.

Hastomo *et al.* [27] found that most students had a positive response to using TikTok for learning English vocabulary. The study revealed that all students felt TikTok helped them improve their vocabulary and appreciated the flexibility of accessing the platform at any time. The ability to choose specific vocabulary topics allowed students to focus on areas where they needed improvement, making it easier for them to retain new words.

A study conducted by Evans *et al.* [28] found that healthcare professionals (HCPs) produced videos with significantly higher validity and reliability than those created by non-HCPs. Additionally, HCP-produced videos often had distinct objectives and were more relevant to viewers. However, it is important to note that a majority of the evaluated videos were created by non-HCPs. Based on these findings, the study recommends that healthcare professionals explore the creation of informative and reliable TikTok videos to improve patient understanding through this platform.

On the other hand, excessive TikTok video consumption can lead to negative consequences, such as increased susceptibility to addiction. Several studies indicate a correlation between more time spent on TikTok and lower academic performance. Therefore, students are advised to monitor the amount of time they dedicate to

TikTok to prevent negative impacts on their academic success [18].

Study Importance and Objective

This study aims to explore the potential of TikTok in enhancing pharmacy education, with a particular focus on mastering drug information. As pharmacological knowledge becomes more complex, finding innovative and effective teaching methods to improve student retention and understanding of drug information is crucial. The study investigates whether TikTok can actively engage pharmacy students, improve their understanding of medication-related content, and enhance overall pharmaceutical knowledge. This research will contribute to the development of novel, efficient teaching strategies in pharmacy education, offering valuable insights into the benefits and drawbacks of incorporating TikTok as an educational tool.

Hypothesis

The hypothesis for this study is that pharmacy students who engage with TikTok videos as an additional educational resource will perform better on drug information assessments compared to those who do not utilize TikTok.

Research Question

How does the use of TikTok as a learning tool compare to traditional teaching methods in enhancing pharmacy students' comprehension of drug information?

Materials And Methods

The study employed a quantitative approach, primarily utilizing structured online surveys to gather data. A series of ten TikTok videos were produced, each focusing on a different drug (amphetamine, donepezil, nitroglycerine, alprazolam, amiodarone, warfarin, carbamazepine, doxazosin, fenofibrate, ropinirole). These videos varied in length, ranging from 30 to 45 seconds. The survey consisted of 15 multiple-choice questions designed to assess participants' understanding of the video content. A total of 30 students from Chicago State University (CSU) participated in the study, with an average age of 26.9 years (± 2.8), including 13 males and 17 females. The students were randomly assigned to one of two groups: the TikTok group ($n = 15$, mean age = 26.7 ± 2.7)

and the traditional learning group ($n = 15$, mean age = 27.1 ± 2.9).

Before the study commenced, participants were required to sign an informed consent form, confirming that they understood the purpose of the study and agreed to participate voluntarily. They were also informed that they could withdraw at any time. To ensure confidentiality, no personally identifiable information, such as names, emails, or phone numbers, was collected. The data was securely stored and only accessible to the research team. The data collection occurred between February 6, 2023, and March 6, 2023. Invitations to participate were sent via email, and no compensation was provided for involvement. The survey gathered demographic information such as age and gender, and participants were given clear instructions to complete the survey accurately. The anonymity of the responses was guaranteed.

The traditional learning group engaged in conventional study methods, including textbook reading and online resources. In contrast, the TikTok group used TikTok videos as their educational tool. Data was collected through a multiple-choice questionnaire created with Google Forms, which helped organize the responses for easy analysis. This format allowed the researchers to efficiently compare and evaluate the participants' answers. The hypothesis was tested using descriptive statistics and t-tests conducted with SPSS software.

Results and Discussion

To compare the outcomes between the TikTok platform group and the traditional learning group, an unpaired t-test was conducted. This statistical method enabled the evaluation of whether there was a substantial difference in academic performance between the two groups. The analysis revealed a highly significant distinction, with the TikTok group scoring an average of 98.8%, in contrast to the 77.6% average of the traditional learning group ($t = 6.4518$, $df = 28$, two-tailed $P < 0.0001$). Furthermore, the 95% confidence interval for the difference in scores ranged from 14.5% to 28.0%, reinforcing the validity of these findings (**Table 1**).

Table 1. Measurement of the results

Measurement	Tiktok platform group	Traditional learning group
Mean	98.8%	77.6%
Standard deviation (SD)	3.2%	12.3%

Standard error of the mean (SEM) 0.8% 3.2%

In the group that used TikTok as their learning platform, the accuracy rate for responses remained consistently high, ranging between 90.9% and 100% for all questions (**Figure 1**). In contrast, the traditional learning group showed a wider variation in performance, with accuracy percentages ranging from 63.6% to 100%. The TikTok group had a lower standard error of the mean (0.8%) compared to the traditional learning group, which had a higher standard error of 3.2% (**Figure 1**). These findings suggest that greater engagement with TikTok-based learning may contribute to enhanced academic performance.

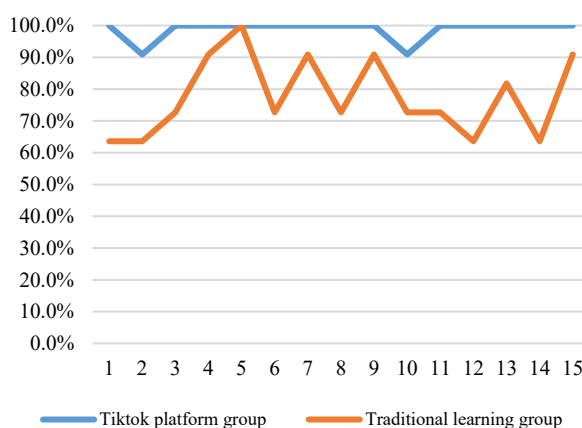


Figure 1. Test results

The primary aim of this research is to evaluate the role of TikTok in pharmacy education, focusing on drug learning. The objective is to explore novel and effective strategies for improving students' understanding of complex pharmacological concepts. To achieve this, ten TikTok videos containing crucial information about ten different drugs were created and posted on the platform. Participants were then asked to complete a survey regarding the content shared in these videos. While the TikTok group relied on TikTok videos for their drug education, the traditional group employed more conventional learning methods such as reading textbooks and using online resources. Data collection was facilitated through Google Forms, using multiple-choice questions, which proved to be an efficient tool. A significant difference in performance was observed between the TikTok group and the traditional learning group, highlighting the potential of TikTok-based learning to foster educational success. These findings

provide important insights into teaching methods and suggest promising implications for integrating social media-based learning strategies into traditional educational settings. The observed performance gap between TikTok users and traditional learners may be attributed to several factors.

Firstly, the short, visually engaging TikTok videos capture students' attention, making learning more interactive and enjoyable. This type of engagement may improve both the retention and understanding of the material. Additionally, TikTok's brief video format presents information in smaller, digestible segments, which aids comprehension and memory retention. This approach contrasts with traditional educational materials, which can be lengthy and overwhelming. Furthermore, TikTok's multimedia features, including music and graphics, appeal to various learning styles, and some students find it easier to understand and remember the content compared to conventional written learning materials. The app's accessibility on smartphones and other devices allows students to engage in brief educational activities at their convenience, making learning more frequent and flexible. TikTok's social elements also foster peer interaction, enabling students to exchange and discuss academic content, which can deepen understanding and offer new perspectives. The repetitive nature of TikTok videos, where students often re-watch them, reinforces the material and provides multiple exposures to the topics.

However, the effectiveness of TikTok as a learning tool may vary depending on the subject matter, the complexity of the content, and the preferences of individual learners. Short videos may not always provide the necessary depth or background information, potentially leading to a superficial grasp of the material. This could hinder critical thinking and deeper learning. Moreover, TikTok's engaging features may cause distractions, leading students to spend excessive time on the platform, which could detract from their other academic responsibilities. TikTok also lacks features that support individualized feedback or interactive discussions with instructors, limiting the level of engagement between students and educators compared to traditional classrooms or other online platforms. Excessive use of TikTok and similar social media could result in negative outcomes such as stress, anxiety, and a sense of inadequacy. The pressures of comparison and content creation on these platforms may also affect students' mental well-being. Additionally, the need for a

stable internet connection and the potential for high data usage may present challenges for students with limited access or data plans. Therefore, TikTok should be seen as a supplement to, rather than a replacement for, comprehensive educational resources to mitigate these drawbacks. Encouraging critical thinking about the media consumed and promoting a balanced approach to media use can help minimize these issues.

It is crucial for educators, policymakers, and content providers to carefully monitor the use of TikTok in pharmacy education or other educational contexts. The creation and dissemination of trustworthy and accurate educational content on TikTok must be prioritized. Before sharing content with students, instructors should take the necessary time to review and verify its quality. Policymakers play a key role in ensuring that all content aligns with educational standards and promotes meaningful learning experiences. It is also important that the creators of educational TikTok content are properly credited by both educators and students.

Conclusion

TikTok should be strategically incorporated into the current pharmacy education curriculum. It can serve as an additional resource to illustrate practical examples or clarify specific regulations. Educators must regularly monitor students' use of TikTok to ensure that it is being used responsibly and effectively as a learning tool. Moreover, students should be actively encouraged to create and share pharmaceutical-related content on TikTok, which can enhance both their knowledge and communication skills.

Recommendations for Future Research

This study demonstrates the potential advantages of incorporating TikTok into the learning process and opens the door for future research on how emerging digital platforms can further enhance academic performance in today's tech-savvy world. The insights from these future studies will be invaluable for educators, administrators, and researchers aiming to improve teaching strategies and meet the evolving needs of students in the digital age. To gain a more comprehensive understanding of TikTok's long-term impact on academic performance, further studies are needed to explore its educational benefits.

Study Limitations

It is important to acknowledge certain limitations of this study, particularly its small sample size and narrow focus on specific academic areas. Future research should involve larger, more diverse sample sizes and explore other fields of education to validate and broaden the findings.

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