

The Impact of TikTok on Pharmacy Education: Enhancing Drug Information Mastery Through Video Learning

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Abstract

TikTok, a well-known application for creating and posting short videos on social media, is an untested educational tool. This study examines ways in which TikTok has impacted pharmacy education with a specific focus on learning concerning drugs. The study compared two groups to see if there are differences between the group using traditional learning strategies – such as textbooks and online resources – and the group using the TikTok platform. Multiple-choice tests were used to evaluate the performance of the two groups. Results show a statistically significant difference between traditional and TikTok-supported learning groups regarding academic performance, highlighting the potential of TikTok-supported learning for improving learning outcomes. These results make valuable contributions to the study of teaching methods and provide evidence of encouraging impacts for implementing advanced social media-based learning strategies in traditional learning environments. This highlights the value of studying diverse and motivating techniques to improve student learning, particularly in pharmacy education.

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

INTRODUCTION

E-learning is a modern approach that combines online education and training, allowing people to learn and receive guidance regardless of their location and schedule. It combines a wide range of learning resources, including lectures, small-group or individual studying, and interactive projects [1].

Social networking sites are websites classified as online applications that allow users to create private profiles. Users can share their personalities, interests, passions, and personal information using these profiles. Being able to create a list of other users, described as "friends" or "connections," with whom they interact on the platform is one of the key aspects of social media platforms. Through these connections, users can build and maintain interactions with friends, family, colleagues, and others within an online environment. Social networking websites are online networks where consumers may share and discuss material such as messages, images, videos, and other forms of media. These platforms promote interaction, sharing of thoughts, and getting involved in group discussions [2].

Social media utilization has grown and is now amongst the most common activities individuals undertake on the internet. Globally, 4.26 billion users were regular consumers of social media in 2021. By 2027, it is expected that there will be close to six billion users worldwide [3]. In the list of mobile-focused countries with the most smartphone social media utilization, East Asia stands out on top worldwide. Next on

the list are digital powerhouses like the Americas and Northern Europe. Users spend 144 minutes a day, on average, on social networking and texting apps, demonstrating the value of social media in daily surfing. This is a significant escalation, exceeding 30 minutes in 2015 [4].

Educators are currently given an excellent opportunity to use the potential of social media and its mobile applications for teaching due to the platforms' increasing popularity. Teachers can involve students in innovative and interactive educational experiences through the utilization of these platforms. For students, social media creates an enjoyable and interesting atmosphere that encourages teamwork, information sharing, and discussions far beyond the traditional classroom. Educators can inspire their students to participate in class discussions and develop a sense of community by integrating

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social media into the lesson plan. By enabling connections between peers, sharing of resources, and requests for help, these structures encourage collaborative learning. Furthermore, social media has a variety of multimedia components that let teachers upload movies, pictures, and interactive data to improve learning [5, 6].

Teachers can take advantage of the impact of personalized learning through social media. These platforms consist of resources that allow for the delivery of individually tailored information, adaptive assessments, and feedback tailored to the demands and learning preferences of students. Social media also makes it easier for kids, parents, and teachers to share information, promoting knowledge exchange while developing a strong community of educators. Social media may also foster cross-cultural understanding and global awareness by bringing together students from many countries. Social media eliminates barriers and facilitates intercultural interactions among students, helping them develop a more global perspective [7]. Users in social media might generate and distribute their digital content, contributing to a huge and valuable resource. Students can connect with faculty members as well as other students through social networking sites, encouraging collaboration and knowledge exchange. Collaborative learning is made accessible by these platforms, which promote an environment where students may freely exchange their knowledge, opinions, and experiences. Social media additionally provides students access to specific information in their areas of interest. Additionally, social media allows students to participate in group projects, brainstorming sessions, and collaborative debates, which promotes a feeling of belonging and teamwork [8].

Platforms that allow users to share interesting content are becoming increasingly popular because young people prefer them for social media. These websites perform as smartphone apps that let users essentially create, edit, share, and watch short videos. The length of these videos ranges from a few seconds to a few minutes. Such platforms are perfect for quick and impulsive communication since users may simply and economically make creative material briefly. Their extensive spread and popularity on social media are made possible by the ease with which they may be rapidly and casually shared. Therefore, platforms for making short videos have become quite popular among youth as an instance of social networking [9].

TikTok is one of these platforms. It is a popular application for uploading films, which allows users to create and share short movies on a variety of topics. The videos may also be viewed via the web app, although the platform is mainly for smartphone and tablet users. TikTok offers users a wide range of creative alternatives with various tools, including filters, stickers, voiceovers, sound effects, and background music. Over time, the site has increased the maximum video duration from 15 seconds to 10 minutes. TikTok recently crossed the 1 billion monthly active user level and will soon replace

Instagram as one of the top social media networks. Since the app's launch, it has exceeded all other picture and video apps in the App Store in terms of downloads. By letting users record immediately and share anything that occurs in their everyday lives, TikTok has changed the process of making and sharing videos. Short videos need less time and effort to create and view because of their format. Users are immediately engaged in an endless stream of fascinating, engaging, and thrilling short films when they first use the app. Viewers may easily become interested in the content because videos constantly play in order due to the autoplay feature. Users frequently spend hours watching random videos on the network because of its addictive nature [9, 10].

Launched in 2016, TikTok has quickly become one of the most used social apps and video platforms worldwide. In 2021, TikTok had around 656 million users around the world. The number of global TikTok installs peaked in 2023, with over 834 million app downloads [4].

Skills in drug information (DI) are crucial for pharmacists who work in any clinical setting [11]. Due to the significant nature of these skills, the Accreditation Council for Pharmacy Education [12] requires that pharmacy programs give their graduates the knowledge and skills necessary to identify, assess, and interpret literature to give patients and healthcare professionals precise and up-to-date DI. This requirement ensures that pharmacists are capable of meeting patient demands while effectively supporting the healthcare team. Pharmacy colleges utilize a range of strategies and active learning opportunities to adhere to ACPE accreditation standards in DI courses. These programs are designed to enhance students' ability to find, analyze, and apply information on drugs to everyday tasks [12].

At the same time, it is generally agreed that pharmacy education is challenging since it involves placing a lot of pressure on pharmacy students to achieve academic success while simultaneously prioritizing their well-being. For students in this field of study, the demanding nature of the course and the requirement to maintain both personal health and academic success can cause enormous stress [13]. Stress levels among pharmacy students are higher compared to those among non-pharmacy students [14].

Literature Review

The scientific literature to date has mainly neglected the role and value of TikTok in education. The specific impact of TikTok on learning outcomes and teaching methods has not received much attention, even though there have been several research studies on the use of technology in educational settings. This knowledge gap indicates the importance of comprehensive studies on TikTok's potential as a teaching tool. Researchers will be able to learn more about TikTok's special qualities, such as its attractive video format, relaxed learning environment, and teamwork possibilities, by examining these aspects of the program. Despite a lack of research on TikTok's benefits for education, several research

papers have pointed out its potential relevance. Studies with positive outcomes highlight TikTok's ability to engage students, enhance vocabulary development, and facilitate collaborative learning. These publications indicate that TikTok may be utilized as an additional educational tool that creates new opportunities for boosting student engagement and understanding.

According to the findings of a study by Escamilla *et al.* (2021), there are several advantages to using TikTok as a teaching and learning tool in corporal expression classes for a bachelor's degree in sports science. TikTok use has been shown to enhance student motivation, provide a stimulating learning environment, and help students develop skills like creativity and curiosity. Due to its potential for having a positive educational influence and its compatibility with the imaginative and original nature of the course, TikTok is advised for integration in creative expression classes [15].

For the foreseeable future, the smartphone app TikTok can be used as an educational tool. This enables short training sessions in just a few seconds for the development and application of new education. The creation of the highest quality e-learning materials is facilitated by using TikTok content that can support educational practices based on the principles of nano-learning [16].

The findings from the studies on TikTok's efficacy can serve as a valuable reference for educators and administrators who are interested in exploring innovative teaching tools to enhance education and learning [17-20].

The studies indicate that educators who aim to assist their students in becoming better authors and speakers may incorporate the TikTok app in their English classes. Students have an opportunity to significantly improve their speaking and grammatical skills by utilizing TikTok [21-23].

The results of the study by Rahmawati and Anwar (2022) present an alternative approach for educators to use to teach vocabulary in the educational setting utilizing the TikTok application, taking into consideration the positive attitudes demonstrated by students. This study indicates the use of TikTok as a vocabulary-learning approach may be advantageous [24].

The research conducted by Reskianissa *et al.* (2022) aimed to assess the usefulness of utilizing TikTok as an innovative learning tool for enhancing computational thinking skills, particularly in online education. The planned respondents for the quantitative research technique were junior high school students in 9th grade. The average post-test score was 89.3%, an increase of 32.2% from the pre-test score of 57.1%, and the results revealed a notable rise in student performance. These results show that TikTok can be used as an innovative, efficient learning tool by sharing short videos [25].

In their study, Roza *et al.* (2023) utilized a qualitative descriptive examination to provide an in-depth description of what students learned and the information they acquired using the TikTok app. The group of participants was selected via a purposive sampling strategy from a population of 30 students. According to the results, the TikTok app has an impact on how students study, as 73.3% of them saw an upsurge in their results, 23.3% of students saw no impact at all, and just 3.3% of students saw a reduction [26].

The conclusions of the study by Hastomo *et al.* (2022) demonstrated that an overwhelming majority of students answered positively to the idea of using TikTok applications to learn English vocabulary. The large number of individuals who completed the questionnaire lends support to this result. Additionally, all the students believed that TikTok assisted them with building their vocabulary in English and praised the simplicity of being able to access TikTok wherever they desired to improve their vocabulary. Additionally, students appreciate that TikTok videos provide them with the option to select certain vocabulary subjects, letting them concentrate on areas they want to get better at. Students generally agree that TikTok allows them to remember new English terminology far more easily [27].

A summary of the study by Evans *et al.* (2022) shows that videos created by healthcare professionals (HCPs) were significantly more valid and reliable than those made by non-HCPs. Furthermore, videos developed by HCPs seemed to have different objectives and proved more relevant. It is important, however, that most of the videos that were evaluated were, in fact, created by non-HCPs. Using these results, it is recommended that HCPs investigate the provision of informative TikTok videos that are valid and reliable, enhancing patient comprehension through this social network [28].

On the other side, TikTok video viewing can have negative impacts that could make students more susceptible to addiction. The results of different studies strongly suggest an association between additional hours spent on TikTok and reduced academic achievement. Students should, therefore, be careful with the amount of time they spend on TikTok [18].

Importance and Purpose of the Study

With a focus on mastering drug information, the aim of this study is to examine TikTok's influence on pharmacy education. Given the increasing complexity of pharmacological knowledge, identifying innovative and effective methods to enhance students' retention and comprehension of drug information is essential. We aim to find out if TikTok can effectively involve student pharmacists, enhance student comprehension of medication-related content, and improve overall pharmaceutical understanding through investigation into the application of TikTok as an educational tool in this scenario. This study will assist in promoting moves towards the development of novel and efficient teaching strategies for the area of pharmacy by

offering relevant information about the potential benefits and limitations of adding TikTok into pharmacy education through actual research and analysis.

Hypothesis

The study hypothesized that student pharmacists who actively use TikTok videos as an additional learning tool will perform better on drug information tests than students who do not use TikTok for this purpose.

Research Question

Compared with different traditional teaching methods, how does utilizing TikTok impact pharmacy students' comprehension of drug information?

MATERIALS AND METHODS

The study's objectives were accomplished utilizing a quantitative method. The main information-obtaining procedures used in the study were structured online surveys.

Ten TikTok videos with important information based on ten different drugs (amphetamine, donepezil, nitroglycerine, alprazolam, amiodarone, warfarin, carbamazepine, doxazosin, fenofibrate, ropinirole) were created and released on the platform. The length of the videos varied between 30 and 45 seconds. The student survey consisted of 15 multiple-choice questions related to the provided information.

A total of 30 students enrolled at Chicago State University (CSU), with a mean age of 26.9 ± 2.8 years, and 13 male and 17 female participants completed the survey in the study. The participants were randomly divided into the TikTok platform group ($n=15$, mean age = 26.7 ± 2.7) and the traditional learning group ($n=15$, mean age = 27.1 ± 2.9).

Each participant was assigned written consent before the study got started, ensuring that they were completely conscious of the goals of the study and could make informed decisions regarding their participation. Before participating in the research, participants agreed to complete the informed consent form and were informed that the participation was voluntary. They were able to withdraw from the study at any point. To protect the participants' privacy, the researchers avoided gathering any personally identifying data, such as names, emails, or phone numbers. Therefore, the anonymity of the participants' identities was maintained. Only the research team had access to the study data, which were kept confidential and securely stored on computers via password protection.

Data was collected between February 06, 2023, and March 06, 2023. Students were invited to participate in the study by researchers via email. No rewards or honors were given to students for their participation. The age and gender of respondents were among the demographic data collected in the survey. Participants got comprehensive directions to ensure accurate completion of the survey, and all participants

were assured of the anonymity of the results.

The traditional learning group utilized traditional methods, including online materials and reading textbooks, whereas the TikTok platform group used TikTok videos as a tool to learn about drugs. Multiple-choice questions were used as a measurement tool in this study to facilitate the collection of data. This tool was created and utilized using Google Forms, which provided an efficient and useful method to gather answers from the participants. The multiple-choice format meant that getting organized and consistent data, which allowed us to evaluate and contrast the answers provided by the respondents effectively, was achievable. The study's hypothesis was analyzed by utilizing descriptive analysis and t-tests using SPSS software.

RESULTS AND DISCUSSION

Comparing the differences between the TikTok platform group and the traditional learning group involved the use of an unpaired t-test as the statistical method of analysis to achieve this. We could assess the means of the two groups utilizing the unpaired t-test to figure out whether there were significant differences in the results between the two methods of learning. The unpaired t-test results showed a highly significant difference between the TikTok platform group and the traditional learning group ($t = 6.4518$, $df = 28$, two-tailed $p < 0.0001$). This identified difference is highly statistically significant. The mean academic performance for the TikTok learners was 98.8%, whereas the mean performance for the traditional learning group was 77.6% (**Table 1**). The robustness of the results was further supported by the fact that the 95% confidence interval for this difference ranged from 14.5% to 28.0%.

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 TikTok platform group, the average percentage of correct responses was consistently high and ranged from 90.9% to 100% for every question (**Figure 1**). The mean percentage varied from 63.6% to 100% in the traditional learning group, meaning it was lower. In comparison to the traditional learning group, the TikTok learners' standard error of the mean was 0.8%, whereas it was 3.2% for the traditional group (**Figure 1**). This research indicates that increased student involvement in TikTok-based learning may be related to improved academic performance.

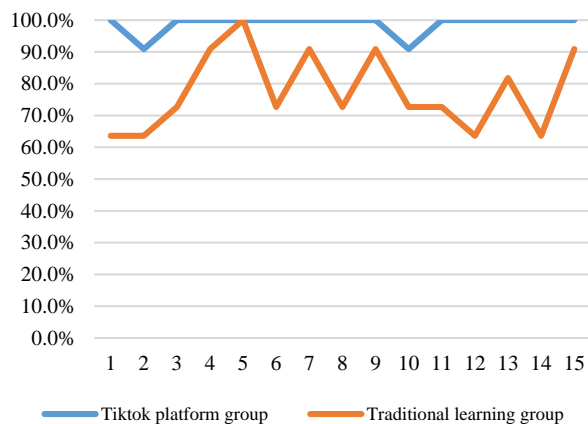


Figure 1. Test Results

The primary objective of this study is to assess TikTok's impact on pharmacy education, with a focus on drug learning. The main goal is to find innovative and effective methods to enhance students' understanding and understanding of challenging pharmacological topics. Ten informative TikTok videos providing important details about ten different drugs were made and shared on the platform to achieve this goal. Subsequently, a survey was given to the participants about the data provided in the videos. While the TikTok platform group depended on TikTok videos for their drug education, the traditional learning group used more traditional learning techniques, including internet resources and textbook reading. Data was easily obtained via Google Forms and collected with the use of multiple-choice questions, which proved an effective method. The difference in performance between the TikTok learners and traditional learning groups was statistically significant, showing the potential for TikTok-based learning to encourage educational success. These results make valuable contributions to the study of teaching methods and provide encouraging impacts for the implementation of advanced social media-based learning strategies in traditional learning environments. The statistically significant performance gap between learners who use TikTok and more usual learning groups could be explained by several factors.

Firstly, TikTok videos' short duration and eye-catching visuals attract students' attention and make learning more engaging and enjoyable. The material to be learned may be more easily remembered as well as comprehended because of this interaction. Secondly, TikTok movies are just a few minutes long, so information is provided in fragments, which makes it simpler for students to understand and remember important ideas. This method contrasts with standard training materials, which are often long and can be boring or overwhelming. Additionally, TikTok's multimedia design, which combines music and graphics, supports a range of learning different modalities. Some students find that this format makes it simpler for them to comprehend and retain knowledge than the usual written methods for learning. On the other hand, TikTok, an app easy to use on smartphones

and other devices, allows students to complete fast educational exercises while on their phones. Due to this accessibility, learning can happen frequently. Students may exchange and discuss academic material with other students using TikTok's social components, which promote a feeling of community and shared learning. Peer discussions can help to clarify lessons acquired and provide fresh viewpoints on the subject. TikTok videos are repetitive, and students often watch them more than once, which can help them remember the information and unintentionally go over topics several times.

However, the effectiveness of learning on TikTok might vary based on the topic, the complexity of the knowledge, and individual preferences. Short films may not be enough to give the necessary context and background information for in-depth knowledge. The briefness of TikTok videos can simplify complicated topics, resulting in a superficial understanding of the subject. This can inhibit critical thinking and in-depth learning. TikTok's attractive characteristics can cause distraction, and students may spend too much time there, putting their studies and other responsibilities on ice. Another crucial factor is that this portal cannot be used for individualized feedback or interactive discussions with teachers, which limits the depth of interaction between learners and educators in contrast to traditional classrooms or online learning platforms. TikTok and other social media platforms should not be used excessively because this can lead to issues like anxiety, stress, and a sense of insufficiency. Comparison with other individuals or the pressure to produce and distribute material may also have an impact on students. All these social media portals need an uninterrupted connection to the internet, which not every student may have access to. Additionally, viewing movies online may take up a lot of data, which can be problematic for students on limited data plans. TikTok should thus be used in addition to, not as a substitute for, complete educational materials to address these drawbacks. Possible disadvantages can be reduced by encouraging critical thinking about media content and implementing balanced media consumption habits.

Teachers, policymakers, and providers should plan for and be aware when monitoring the use of TikTok in pharmacy education or any other educational situation. It is essential to create and share reliable and genuine educational material on TikTok. Before providing students with the material, teachers should take the time to examine and verify it carefully. The drafting of policies by policymakers plays an essential role in ensuring that all content conforms to educational standards and encourages students to have practical learning experiences. The writers of educational TikTok material should always be credited by teachers and students.

CONCLUSION

TikTok must be purposefully included in the present curriculum for teaching pharmacists. It may be used as an extra tool to demonstrate practical examples or to clarify

rules. Teachers and educators should regularly track the use of TikTok by students to ensure it occurs responsibly and that the platform is being used as a tool for learning. Students should be actively encouraged to contribute to creating pharmaceutical-related TikTok content. The method will help in knowledge acquisition and communication improvement.

Suggestions for Future Research

This study highlights the potential benefits of TikTok-based learning and paves the way for further research into how new digital platforms could enhance academic outcomes in the technologically advanced world of today. The implications of these research projects are crucial for teachers, executives, and researchers working to enhance teaching methods and fulfill the many requirements for modern students in the digital era. Further research and studies on TikTok's educational value are required to understand its long-term effects on academic achievement better.

Limitations

It is essential to recognize the study's limitations, particularly its small sample size and focus on specific areas of study. It is necessary to do further research to verify and expand upon these results using more varied samples, larger in size and representative of other educational fields.

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