

Identifying Usability Issues of the Most Popular Mobile Education Apps from User Reviews

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ABSTRACT

The study of mobile apps is a hot research topic because of the expanding use of mobile devices around the world. App user reviews provide a channel of communication between app developers and their end users. They are the best source for understanding user opinions and concerns. Analysis of mobile education apps from various angles and contexts is revealed by several literature reviews. However, there is hardly any study analyzing the emerging issues of Adults education apps in the body of literature. The goal of this study is to identify the main topics related to emerging usability issues in user reviews of the apps on the Google Play Store. The study analyses 2,28,660 negative reviews and 9,93,460 positive user reviews of the top five popular education-related apps (Coursera, Edx, LinkedIn, Skillshare, and Udemy) using Natural Language Processing tasks such as Latent Dirichlet Algorithm (LDA). The results identify several inherent topics in the negative reviews such as account login issues, security and privacy issues, payment issues, content-related issues, app usability issues, customer service issues, and bug-fixing issues. On the other way, the analysis of positive reviews reveals ease of use, the best learning app, user-friendly and great platform.

Keywords: Mobile Education, Adult Apps, Topic Modelling, Latent Dirichlet Allocation (LDA), User Reviews

INTRODUCTION

Mobile technologies are widely used today even in places where there are few books, schools, or computers. In order to achieve SDG 4 – Education 2030 and create shared futures of education beyond 2030, digital technologies will be used as a common good [1]. Smartphones are a type of handheld device, and they contain mobile apps that users can download and install based on their preferences [2]. Behind the adoption of smartphones, the essential thing is the appearance of app stores, where third-party developers publish mobile apps that users download on their devices[3]. Mobile apps are software programs created specifically for mobile devices. Mobile apps come in a variety of genres and can be downloaded through app stores [4]. The utilization of these apps



has increased as a result of the Internet's accessibility on mobile devices (such as smartphones, tablets, and laptop PCs)[5].

The dramatic growth and expansion of computers and mobile devices have eased mobile education and mobility due to wireless network connections[2]. The decreasing cost of smartphones and their increasing capabilities, constant access to internet services, and the growth of specialty marketplaces like the app store from APPLE and the play store from Google have all led to an increase in the number of users of these software programmers. This encourages more people to use mobile learning apps on a regular basis[6]. According to 2015–2019 report of Global Education Apps Market, there are over 3.17 million applications available in different stores, and over 15% of them fall under the category of education[7]. The expanding trend of online education imparted through mobile systems leads to the increase of mobile education applications globally. Digital technology-based applications have changed teaching and learning by creating a wide range of opportunities[8]. The interaction between apps and learners is intricate, dynamic, and constantly changing, necessitating critical analysis[5].

1.1. Mobile Education Apps

An "education application" is a software program that can be downloaded and installed on tablets or mobile phones and includes learning resources [9]. Students and educators can access content anywhere, at any time, with the aid of education apps. Parents, teachers, and students have grown more accustomed to using educational apps on touch-screen smartphones and tablets[10]. According to a CNET report published on Sept 1, 2020, shows that due to the pandemic coronavirus schools push the usage of education apps for teaching purposes. According to the NMC Horizon Report (2017 Higher Education Edition), mobile devices are essential to new teaching paradigms, allow students to access course materials from any location, and give them new opportunities to engage with the material. Mobile apps, for instance, enable two-way communication in real-time, assisting educators in effectively meeting the needs of students.

According to [11], mobile devices are most commonly used among elementary schools and higher education for learning and mobile learning focuses on primary and secondary education rather than higher. As per the literature, a large number of studies analyzed the content of mobile education apps for children [12] & [13] and focused on app design [14]. A study on the uses and gratifications of educational apps identified seven gratifications for using these apps are academic assistance, convenience, entertainment, social influence, novelty, engagement and activity for learners [10]. Even though numerous studies on higher educational apps have been conducted. The adoption and use of mobile devices for learning have been examined in earlier studies on educational technologies and interventions [15]&[16]. Mobile devices aid in completing academic work, but according to a survey of undergraduate students, they might also distract from learning objectives [17]. Also, to comprehend mobile learning, research frequently apply general



theoretical models such as the Technology Acceptance Model for information system adoption and usage [18].

1.2. User Reviews

Application markets offer a medium of contact for app developers and their end users through app reviews, which let users give comments on the apps. The greatest approach to assess how users feel about an app is through user reviews, and that feedback influences the development of the app later. User reviews are the best source to get feedback from users to analyze their opinions and concerns. Users feedback is an essential element for continuous development of app. Users can write reviews after using the app including 1- to 5-star ratings. So, end user reviews are the feedback to these apps regarding their app success. [19].As per literature [4], this study examines few number of user reviews to identify inherent topics of mobile learning apps. In the study [20], analysis the user reviews of two competing products.

1.3. Context and significance of study

Among various app stores, two of them Google play store and Apple app store are the most popular. These markets provide several apps for end users to find, download and purchase. There are numerous education apps available on these stores. The leading app stores collectively provide more than 6 million apps, with Google Play holding the majority of those. But there is still little research on these apps for Adult learners. So, it is important to comprehend how educational apps are used by Adult learners. The literature offers a limited understanding of the emerging issues from users' reviews and ratings of these apps.

A lot of research has been done, there is hardly any study to examine the user reviews of mobile learning apps for Adult learners. Studying user evaluations will give practical knowledge about the positive aspects, advantages, problems, and restrictions of these apps. This study analyses user opinions of five popular apps from the Google Play Store. To learn more about the characteristics that users will find appealing and that will affect usage and the usefulness of these apps, we employed topic modelling. Based on user ratings, we examined reviews labelled as "negative" and "positive". We conclude with some emerging topics from both negative and positive reviews that can be used as a suggestion and recommendations for further enhancement of these apps in future.

METHODOLOGY

The purpose of this study is to highlight the major themes and problems relating to the issues and challenges faced by the adult users of mobile education applications on the Google Play Store. This study pinpoints the areas where additional app development could enhance app use and



support identifying the themes that users frequently discuss in their reviews of these apps and the user ratings for each of them. To build the dataset of user reviews of mobile education applications, this work aims to choose the "top free" lists of 'Education Apps of Adults' from the google play store. We select the five (Coursera, Edx, LinkedIn, Skillshare, Udemy) most popular apps from the education category with similar ratings greater than 4.1 and over 1 million downloads. There is no such category of 'adult education apps', but we select the apps that are not under the category of kids. We apply our search string in the google play store as 'Adults education apps.' The tool used for choosing the applications was AppGrooves. In August 2022, AppGrooves was used to identify five top apps from google play store. By combining quantitative analysis (a data-driven algorithm first filters out high-quality apps) and qualitative analysis (an independent editorial staff further refines the selected apps) during the review process, this tool gathers, evaluates, and scores applications[21]. While collecting data of mobile apps, the following Table 1 shows the inclusion criteria of mobile education apps for adults. The description of apps used in the study shown in Table 2.

Inclusion criteria	The app must be free
	The content of apps must be in English
	The app must require data related to personal details
	The app must have 10,000 downloads and should be minimum 3.5-star rating app on Google play store

Table (1)- The Inclusion Criteria

Name	Installs	Total reviews	Ratings
Udemy- Online Courses	10M+	456K+	4.4
LinkedIn Learning	10M+	163K+	4.8
edX: Online Courses	5M+	103K+	4.6
Coursera	10M+	241K+	4.4
Skillshare: Online Courses	1M+	74K+	4.4

Table (2)- Dataset Description



We used python-based web scrapping tool to extract the user reviews and we scraped only English written reviews. These reviews were crawled by using a python application based on the API of Google Play scraper as it does not require any dependencies. The following Fig shows the working methodology of this study.

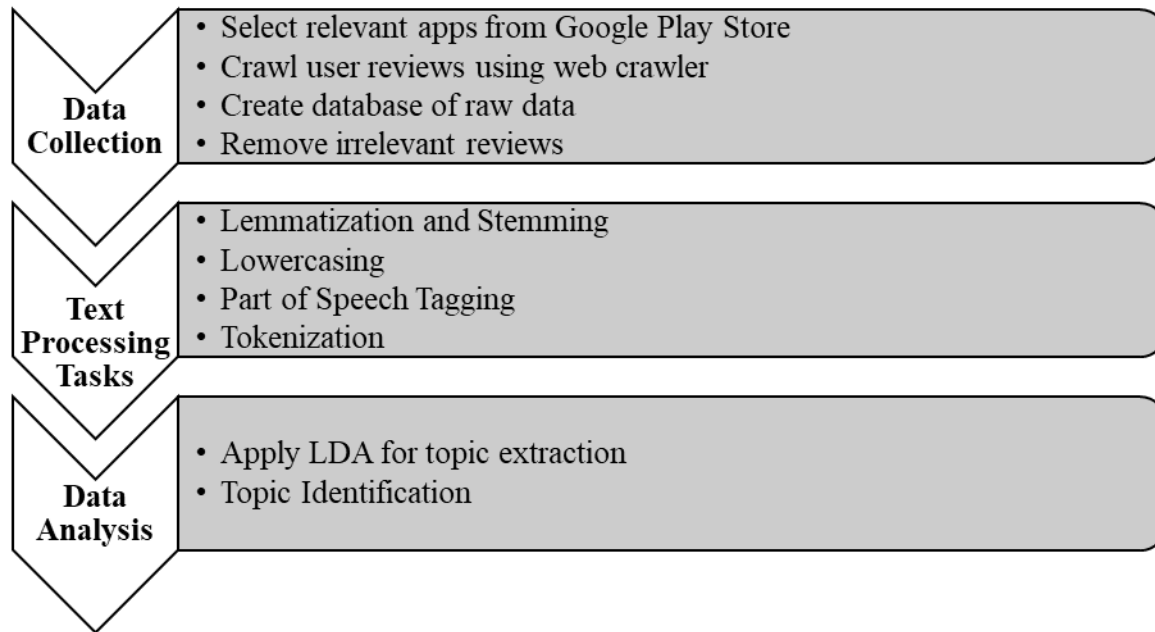


Figure – 1. Methodology Workflow

The study methodology is followed as initially user reviews extraction using python script, then text processing tasks (Lemmatization and Stemming, Lowercasing, Tokenization, Part of Speech Tagging) using NLP (Natural Language Processing), then Latent Dirichlet Algorithm (LDA) and Topic Modeling text-combining techniques are used in this study to analyze about 13,72,424 reviews. Topic modeling is a category of statistical modeling for identifying and characterizing topics inside a collection of documents. Latent Dirichlet Allocation (LDA) is a popular technique within NLP community that treats the text documents as probabilistic distribution sets of terms or topics[22]. The topic modeling approach helped to identify distinct topics and found underlying themes that impact user experience.

RESULTS AND ANALYSIS

The reviews for the following apps: Coursera, eDx, LinkedIn, Udemy and Skillshare were all extracted for this study from the Google Play Store, which contained a total of about 13,72,424 reviews. The studies considered only English-language reviews. For further analysis, Natural Language Processing tasks (Lemmatization and Stemming, Lowercasing, Tokenization, Part of

such as usability issues, content issues, billing issues, login issues[24][25][26]. This study highlights the issues in Adults Mobile Educational Apps users' reviews.

Topic 1: Security and Privacy issues

The user reviews also show some privacy and security related issues in their comments of the educational apps such as accessing or collecting user data, password related information, credit card details etc. The sample of comments is shown below:

“Permissions. Why does this app need access to my calendar and contacts? There are many other security threat vectors.” (Security issue)

“Norton Mobile Security now flags this app as HIGH RISK. The permissions are far too intrusive for an app like this. Beware!”(security issue)

“Could be great, however privacy policy awful” (privacy issue)

“Wants your private password to your email account DON'T TOUCH IT !!!!!!!” (Privacy issue)

“Warning! Overpermissioned app. Permission creep in updates. Explain your need and use of privacy sensitive perms CONTACTS/ACCOUNTS and PHONE.” (Privacy issue)

“will steal all your money from your personal accounts Guys. Totally bunch” (Privacy issue)

Topic 2: Account login issues

Users in their reviews also highlight the account login issues like user is not able to login into his/her account even the network is there but continuously showing there is network error or not able to login into account e.g. login, sign up, log out. The sample of comments is shown below:

“one of the best app you can ever find for learning new skills or for improving your skills. however,after updating the app i got some serious issue regarding login and i can not even login to my own account.The ridiculous thing is that i can not even change my password by "forget password" option from their link provided via gmail.They updated app to improve security and bug fix. So, i wonder how you improve your security?” (Login issue)

“I can't log in to my account. There's a prompt that tells "network error" but our net is fine” (Login issue)



Topic 3: Payment issues: Transaction related and Refund related issues

This topic highlights the user reviews related to billing or subscription and refund related issues. The sample of comments is shown below:

“Worst app. I made payment and it showed error but money is deducted. But from my bank side it is a successful transaction. I have created 3 support tickets and Coursera people closed it without resolution. They are telling money is not credited. So I asked for the proof and guess what nobody is responding now... I highly recommend don't use this.. they don't have a proper support system.” (Transaction issue)

“This is the worst app. The refund for one of my course never happened. Another course payment didn't even confirm. Your help center is just FAQ's. What scam is this. (Refund issue)

This company is a SCAM! I went to cancel my 7 day free trial and they already charged my card. There is no contact email or phone number to dispute this. 100% SCAM” (Subscription cancellation issue)

Worst app. Made payment but due to technical glitch on their side, access for the course was given after 4 days. But, counted the deadline as on the date on which payment was made.” (Transaction issue)

“Horrible refund policy. My state requires a 30 day refund for payments, but I can't even contact them to raise the issue. Let it slip a day and they will not offer a refund, you can't even find a contact to ask. It is impossible to find a contact for help on the site or in the app.” (Refund issue)

“Canceled a subscription immediately after viewing the first video in the course, but was charged anyway after the free trial. As per their unfair refund policy, I can't refund the money they essentially stole so I'm basically screwed.” (Refund issue)

“My credit card was debited twice to register standing instruction of Rs 2/- for free one month learning however app does not reflect any update.. also there is no option to register complaint and get it fixed. Their help center in the app does not work.. horrible app.” (Transaction issue)

“THEY CHARGE YOU AND DONT LET YOU CANCEL. No chance to cancel subscription. No option to request help to cancel subscription, keep moving to Play store to manage subscription, where it does not even come up. Have been charging me æ20 a month without any way out.” (Subscription cancellation issue)

“Send my money back! I uninstalled this app because I don't use it, they took my money today for a full year!!!! Do not trust this app nor the developer. Be aware of bad apps on Google play” (Refund issue)



Topic 4: Content related issues

User reviews also highlight the content quality issues like video quality issue, content downloading issue or limited content issues. The sample of comments is shown below:

“You have a block on viewing content on the mobile phone. Why did you create this app? To literally gaslight your members. Then try to locate customer support. Contact email is buried deep in a forest of useless FAQs. I had to email the privacy team to reach a human. I do not expect to remain with this service unless some things change pretty quickly.” (Content issue)

“Please give us the ability to change video quality!!!” (Video quality issue)

“The videos are not getting load, and the download speed from the app of the videos are slow too. Please fix it soon.” (Video downloading issue)

Topic 5: Usability issues

This topic highlights the usability issues of educational apps such as interface related issues, platform related issues, battery drain related issues. The sample of comments is shown below:

I'm not liking this app at all. The videos do not auto rotate even if I turn on landscape mode. Now I can't seem to find my program I'm running. The UI is dull. I cant enable dark mode, the app is just too white and bright. Doesn't make learning fun. Needs improvement in the user interface area. Also for an app that services a lot of app development courses and all, this is not a good representation of the resources you guys have.” (Interface issue)

“And good mobile app. Works nice, you can download the courses on Wi-Fi and the battery drain is quite reasonable” (Battery drain issue)

Don't sign up for free courses. They never start. They just use your email to spam you with advertising. Avoid! (Free subscription issue)

Topic 6: Customer service issues

User reviews under this theme highlight the issues related to customer support and services. The sample of comments is shown below:

“Worst app ever. No proper customer support available. I had not verified my ID and name verification was doing great for a couple of certificates. I had my whole name on the certificates. I didn't fiddle with my Name verification and went for ID verification and automatically only my surname is getting printed on my certificate. I tried contacting the team via their contact us



messaging feature but no replies yet. And they have mentioned that ID verification is permanent. I don't know why. (Poor customer service)

Topic 7: Bug fixing issues

This topic shows the issues like connectivity problem, app crash problem, app loading problems. The sample of comments is shown below:

“Buggy and keeps saying “page not found”. Terrible app. Website on computer is better. Please fix it. Not happy.” (Connection issue)

“I recently updated my coursera app and it logged out my account. I tried to log in but it keeps crashing. I also reinstalled it but it's crashing. Please fix it immediately. Thank you!” (Crash issue)

“Absolutely the worst app ever. Doesn't load or takes ages to load. I wish the quality of this horrible app can match the otherwise great content.” (Loading issue)

Analysis of positive reviews

On the other hand, majority of users providing feedback in positive reviews were generally pleased with the apps they use. People found these apps useful, helpful, and knowledgeable.

Topic 1: Ease of use

This topic highlight that the usability of app is very easy and provide lots of content. The sample of comments is shown below:

“Very useful app for those who are eager to learn anything eg. Computer science, programming language, business studies, humanities, communication skills, languages, from the top professors from the best colleges and universities around the world. With this u can be independent learner all u need to do is to maintain the consistency and practice regularly whatever you learned.”

“I really love the app and the courses provided. I have a passion for learning languages and thanks to this app I have done 6 diplomas in different languages. App is very easy to operate and I really enjoy using it. Been using this app for a long time and never had any problems. Just one suggestion. Is there any chance to add Korean language to the list please? I really recommend this app. Thank you.”

Topic 2: Best learning app

User reviews highlights the best learning app experience as shown below in their comments.



“Best learning app ever!”

“Best learning app and I learn graphic design concepts, Digital marketing, Email marketing and English communication skills. It's very helpful my career and self development”

Topic 3: User-friendly

The users reviews also shows the friendliness of educational apps.

“Great app, really works well with the course material, and the captions that are displayed beneath videos are very user friendly.”

“Very useful app. I was able to complete my lectures while traveling a long distance from my residence to workplace. It helps me to fully utilise those ~3hr of time spent in daily commuting. Very user friendly way to complete the courses.”

Topic 4: Great Platform

Reviews of users also highlights these educational apps as great learning platforms as shown below:

“Actually one of the best learning platforms existing. Top notch material, plenty of choice and fare prices. Also, they kindly provided me with financial aid needed for my career. I hope to stay in long relationships with my beloved Coursera. Thank you for the opportunity to get better with you! Always recommend you to friends who want to learn and develop.”

CONCLUSION

The study discussed how learners interacted with mobile apps. It is distinctive in the way it examines user reviews of mobile educational apps for Adult learners on Google Play Store. The study has sought to bridge the observed literature gap by studying the large number of user reviews to identify the emerging issues among top five mobile education apps. This work contributes to determine how to use users' feedback for additional changes and further recommendations and enhancement for app developers. Consequently, future research can be done on not so popular mobile education apps to identify user challenges.



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