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A Study of Educational Technology Startups in India

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ABSTRACT

Background: EdTech startups are shaping the Indian education industry with the aim of making education truly interesting. The covid-19 pandemic has affected all businesses except EdTech sector. EdTech industry is among those sectors that has observed rapid growth during covid-19. EdTech startups has witnessed a flood of users, funding, and stakeholders like never before. All these reasons make EdTech an interesting topic to study. In order to know EdTech, this study makes an attempt to carry out sentiment analysis of customer reviews on apps of leading educational technology (EdTech) startups.

Purpose: The objective of this paper is to study the sentiments of people towards different EdTech startups in India. The objective is achieved by conducting sentiment analysis of app reviews of three leading EdTech startups operating in India.

Methods: The study uses qualitative research where descriptive research design is used. Data is collected in the form of consumer app reviews from google play store. Reviews were taken for last six months. Total sample of 750 reviews were taken in the study which include 300 reviews for Byju's learning app, 220 reviews for Unacademy and 230 reviews for Physicswallah. Purposive sampling is applied in this study. Sentiment analysis techniques is applied with the help of Azure Machine Learning MS Excel add-in.

Results: The results of the study suggest that majority of users have negative sentiments towards Physicswallah app, Byju's learning app, and Unacademy learner app.

Conclusions: The results of this study would be useful to predict people sentiment about Edtech startups apps. The findings of this study give information to management of Edtech startups about positive or negative opinions of their application users so that they can develop strategies exclusively. Further research can include greater number of reviews and also consider demographic data of the reviewers.

1. Introduction

The education industry of India is expected to achieve a market size of $225 billion by 2025 (PGA Labs, 2020). Education Technology or EdTech within the education industry, represents the segment empowered by technological advancements. EdTech is a combination of "Education" and "Technology" and refers to the use of technology, whether in the form of hardware or software, to enhance educational outcomes. Higher education institutions can integrate existing EdTech solutions into their systems in order to enhance their teaching models and build resilience against future threats in the field of education (Jager, Falk, & Lenz, 2021). The EdTech industry in India is characterized by approximately more than 4,000 players. EdTech start-ups are shaping the Indian education industry with the aim of making education truly interesting. These EdTech start-ups such as Byju's, unacademy, Physicswallah, and vedantu are making it easier for students to study for any competitive examination. These EdTech start-ups are helping learners in understanding complex concepts with ease through use of emerging technologies. EdTech industry is among those sectors that haves observed rapid growth during covid-19 (Mukherjee and Ganguly, 2021). Investors are recognizing the potential of EdTech as the next big thing, especially with advancements in Artificial Intelligence. All these reasons make EdTech an interesting topic to study. In order to know EdTech, one of the ways is to analyzse the reactions

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of learners towards these EdTech start-ups. Researchers are using online reviews of their products and services and feedbacks of consumers for analyzsing consumer reactions (Lin *et al.*, 2017). Customer reviews on the social media or product review sites affect purchase decision of customers (Jalilvand *et al.*, 2011). During the purchase stage, people see reviews or comments of others on social media and then decide their choices (Naz, 2015). Customers can reduce uncertainty in their purchase through online reviews and product information (Sharma *et al.*, 2011). Customer reviews are capable of creating positive effect on retailers as well as can remove all negative information about the retailers (Chatterjee, 2001). Looking at the effects of online customer reviews, thus. it is important for marketers to manage this electronic word-of-mouth communication. Marketers are trying to provide timely feedback on the online platforms to customer reviews in order to develop and retain the brand trust (Bhandari and Rodgers, 2018). Thus, it is important for companies and researchers to carefully examine the online customer reviews and feedbacks. Segregation of such customer reviews into positive and negative can help future buyers to reach at a better decision (Singla *et al.*, 2017). Growing text analytics applications are broadening the understanding of the online reviews through new tools. Such tools are helping researchers in gaining new insights through customer reviews on the attitude of the consumers. One such tool is sentiment analysis. Sentiment Analysis has emerged as an important tool in text analytics (Geetha *et al.*, 2017). Sentiment is a feeling, consciousness or thought about something. Sentiment analysis is a process for determining whether a review is expressed to be positive, negative or neutral. Sentiment analysis can be defined as a study to determine public opinion about products, services, movies, etc. (Widyaningrum *et al.*, 2019). Sentiment analysis involves classifying opinions in text into categories like positive or negative or neutral. Sentiment analysis is considered important for decision making by companies (Kang *et al.*, 2018). Sentiment analysis is used to extract valuable and relevant information from customer reviews which can ultimately benefit both consumers and manufacturers.

This study makes an attempt to carry out sentiment analysis of customer reviews on apps of three educational technology (EdTech) start-ups i.e. Physicswallah, Unacademy, Byju's. The reason of studying EdTech industry is the fact that it is one of the sectors that has seen rapid growth during covid-19. The pandemic has affected all businesses except EdTech sector. EdTech start-ups haves witnessed a flood of users, funding, and stakeholders like never before. According to Google Trends, 'EdTech' searches were among the top that gained 60 percent on the Indian internet. This paper is organized into six sections. Section I talks about introduction and section II provides a review of related work. Section III and IV describes the objective and research methodology respectively. Section V describes the results of the analysis and section VI discusses the conclusion, limitation and scope for future work.

2. Literature Review

EdTech start-ups are shaping the Indian education industry with the aim of making education truly interesting. EdTech is a combination of two words i.e. Education and Technology. EdTech refers to technology (hardware or software) designed to enhance educational outcomes. Some examples of EdTech are interactive screens, online classes and MOOCs. EdTech start-ups are those start-ups which use technology to make education easier for all. These EdTech start-ups are helping learners in understanding complex concepts with ease through use of emerging technologies. Byju's, an Indian EdTech start-up, has grown into one of the top EdTech companies in the world. Byju's has a revenue of 520 crores INR and employs more than 9,000 employees. Watson *et al.* (2023) unveiled two distinct categories of factors exerting an influence on EdTech usage i.e. structural factors and non-structural factors.The authors also talked about the well-being of children, particularly in relation to their eyesight, and the potential risk of children accessing material unsuitable for their age group. Yan and Li (2023) pointed out that digital education technology has the potential to ignite students' intrinsic motivation, prompting them to engage in learning more enthusiastically, and ultimately augmenting their cognitive skills. Lufungulo *et al.* (2023) suggested some EdTech innovative approaches and strategies centered around lecturers, lessons, resources, and students, employed by educators when conducting online teaching in a resource-constrained university environment. These can play a crucial role in effectively managing the challenges of online teaching and learning. Bargavi and Shanmugam (2022) emphasize the need for collaboration among various stakeholders, including governmental organizations, the private sector, and EdTech start-up partners, to identify appropriate digital technologies for interventions in the EdTech value chain.

Ali *et al.*, (2017) categorized social media into four types based on their application usage: the first is content communities, which include Youtube and Instagram: the second is social networking, which include Facebook and LinkedIn: the third one is blogs, which include Quora, and the last one is micro-blogs, which include Twitter. The online platforms like Instagram, Twitter, Facebook, WhatsApp, and various other social media platforms have transformed the people's behaviour and expectations (Gupta *et al.*, 2020). Such social media platforms give a

plethora of opportunities for the consumers to express their views, feedback and comments about the products. Studies on customers' online reviews bring out various dimensions of customer behaviour. A product's feedback on the social media or on any product review site will have both positive and negative effect on customers' purchase decision (Jalilvand *et al.*, 2011). Companies can improve their products and services through the feedback given by consumers on social media (Drus and Khalid, 2019). The length of a review affects the ratings given by the consumers (Yoon *et al.*, 2019). Customers while purchasing a product see reviews or comments of others and then take decision accordingly (Naz, 2015). Uncertainty in the purchase decision is reduced through the help of online reviews by customers (Sharma *et al.*, 2011). Ghasemaghaei *et al.* (2018) suggested that longer reviews are often associated with better product performances. Digital reviews play an important role in influencing consumers' buying patterns (Singla *et al.*, 2017).

Sentiment analysis is one of the text analytics applications which determine whether a review is expressed to be positive, negative or neutral. Text analytical tools help the researchers to explore the online consumers' reviews (Miley and Read, 2011; Lakshmi *et al.*, 2017; Li *et al.*, 2018).Sentiment is a feeling, consciousness or thought about something which influence the purchase decision. Sentiment analysis is a technique that identifies whether sentiments expressed in text represent positive or negative feelings toward a specific product or service (Nasukawa& Yi,2003). Sentiment analysis is an approach that uses Natural Language Processing (NLP) to extract, convert and interpret opinion from a text and classify them into positive, negative or neutral sentiment (Agarwal *et al.*, 2015). Mansour (2018) defined sentiment analysis as a process that automates mining of opinions, speech, attitudes, views and emotions from text through Natural Language Processing (NLP). There are two main methods of sentiment analysis, i.e., the machine learning approach and the lexicon-based approach. The machine learning approach utilizes algorithms to extract and detect sentiment from a data, while the lexicon-based approach works by counting the positive and negative words related to the data (Drus and Khalid, 2019). Sentiment Analysis can be defined as a computational study that extracts subjective information from the text. (Singla *et al.*, 2017). Sentiment scores can be used as a proxy to measure customer satisfaction (Al-Otaibi *et al.*, 2018). Sentiment analysis can be applied by companies to better understand their customers and make the necessary decision to improve their products or services (Gursoy *et al.*, 2017). Sentiment analysis can be applied in E-commerce, in healthcare, in identifying sentiment needs of people during a disaster and prepare an appropriate response to rescue, in predicting political election, and in finding the level of depression of a person by observing and analysing emotions from text (Ebrahmi *et al.*, 2017; Ali *et al.*, 2017; Ragini *et al.*, 2018; Hassan *et al.*, 2017; Joyce *et al.*, 2017). Need of sentiment analysis is growing substantially, especially with the rise of social media as a medium for the public to express their opinion (Widyaningrum *et al.*, 2019).

Previous studies on EdTech have discussed the significant transformation brought about by the widespread adoption of digital technology in the teaching-learning process in India, the future of EdTech companies, the need for enhanced EdTech in higher education institutions, the disruptive potential of EdTech start-ups, the potential for collaboration between higher education institutions and EdTech companies, and the Covid-19 pandemic role in accelerating the growth of Education Technology (EdTech) start-ups. However, the author could not find studies related to sentiments towards EdTech start-ups. This study makes an attempt to fill this gap. Also, it can be seen that most of the research on sentiment analysis has been done on customers' reviews extracted from micro-blogging sites specifically Twitter. Very few studies have talked about reviews of apps on Google Play Store. Thus, this study attempts to conduct sentiment analysis of app reviews of few EdTech start-ups operating in India.

3. Research Objective

The objective of this paper is to study the sentiments of people toward different EdTech start-ups in India. This objective is achieved by conducting sentiment analysis of app reviews of EdTech start-ups operating in India.

4. Research Methodology

The study uses qualitative research where descriptive research design is used. Data is collected in the form of consumer app reviews. The consumer app reviews are collected from google play store where each review represents a collection of words that reflects the user's opinion about the app. Total sample of 750 reviews were taken in the study which include 300 reviews for Byju's learning app, 220 reviews for Unacademy and 230 reviews for Physicswallah. Purposive sampling is applied in this study. Sentiment analysis techniques is used for analysing the data. Sentiment analysis is more cost and time efficient as compared to traditional market research methods like surveys or opinion polls (Geetha *et al.*, 2017). This study uses Azure Machine Learning MS Excel add-in to conduct sentiment analysis.

4. Results

Sentiment analysis for Physicswallah: Table 1 shows the result of sentiment analysis for Physicswallah app. From table 1, it can be concluded that out of 230 reviews, there are 76 positive reviews, 150 negative reviews and 4 neutral reviews. The study shows that 65% of the users have negative sentiments towards Physicswallah app and only 33% of the users have positive sentiments towards Physicswallah app. Thus, it can be concluded that majority of users have negative sentiments towards Physicswallah app.

Table 1: Sentiment analysis results for Physicswallah App.

Type of Sentiment	Number of Sentiments (230)
Positive	76 (33%)
Negative	150 (65%)
Neutral	4 (2%)

Sentiment analysis for Byju's Learning App: Table 2 shows the result of sentiment analysis for Byju's learning app. From table 2 it can be concluded that out of 300 reviews there are 87 positive reviews, 201 negative reviews and 12 neutral reviews. The study shows that 67% of the users have negative sentiments towards Byju's learning app and only 29% of the users have positive sentiments towards Byju's learning app. Thus, it can be concluded that majority of users have negative sentiments towards Byju's learning app.

Table 2: Sentiment analysis results for Byju's Learning App.

Type of Sentiment	Number of Sentiments (300)
Positive	87 (29%)
Negative	201 (67%)
Neutral	12 (4%)

Sentiment analysis for Unacademy Learner App: Table 3 shows the result of sentiment analysis for unacademy learning app. From table 3 it can be concluded that out of 220 reviews, 40 are positive reviews, 161 are negative reviews and 19 are neutral reviews. The study shows that 73% of the users have negative sentiments towards Unacademy app and only 18% of the users have positive sentiments towards the app. Thus, it can be concluded that majority of users have negative sentiments towards Unacademy learner app.

Table 3: Sentiment analysis results for Unacademy Learner App.

Type of Sentiment	Number of Sentiments (220)
Positive	40 (18%)
Negative	161 (73%)
Neutral	19 (9%)

Conclusion

The objective of this paper is to study the sentiments of people towards different EdTech startups in India which is achieved by conducting sentiment analysis of app reviews of EdTech startups operating in India. The study uses qualitative research where descriptive research design is used. Data is collected in the form of consumer app reviews from google play store. Total sample of 750 reviews were taken in the study which include 300 reviews for Byju's learning app, 220 reviews for Unacademy and 230 reviews for Physicswallah. The findings of the study concluded that majority of users have negative sentiments towards Physicswallah app, Byju's learning app, and Unacademy learner app. These results indicate that the startups and their services are not welcomed and accepted by the users. The findings of this study give information to management of Edtech startups about positive or negative opinions of their application users so that they can develop strategies exclusively. The results of this study would be useful to predict people sentiment about Edtech startups apps. The study has taken less data and also has not considered the demographic data of the reviewers. Thus, future research works shall include a greater number of reviews and also consider demographic data of the reviewers. The future study could also analyse acceptance and service quality of EdTech startups along with sentiments.

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Authorship contribution

Dr. Dinesh and Kalpana conceived of the presented idea. All authors contributed in the data collection, analysis and interpretation of results. All authors reviewed the results and approved the final version of the manuscript.

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