

Integration of Technology In Education and Existing Innovative Best Practices Developed By Education Technology Startups

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Abstract

The ability of technology to level the playing field for students is one of the most significant aspects of technology in education. Technology has the potential to significantly alter how people learn. It may support the development of relationships between teachers and students, help us rethink how we learn and collaborate, close long-standing equity and accessibility gaps, and modify the learning process to accommodate the requirements of all students. In the previous 100 years, there haven't been any (groundbreaking) innovations in education. Since there haven't been any advances that enable faster or better learning or teaching, we primarily teach and learn in the same manner as our ancestors did. As a result, the need for improved educational technology (edtech) in the field of education is increasing. This article investigates which creative business models are created outside of higher education institutions (in the edtech industry), particularly by entrepreneurs, because innovation frequently emerges from startups. The present study provides an overview of technology integration and also analyse the elements of innovative business model in the field of education technology startups in higher education and also to identify the original practices in learning and teaching. This study is descriptive in nature, all of the necessary and relevant information was gathered from various publications, journals, and websites.

Keywords: Ed tech startups, technology integration, business model

Introduction

Education reformers increasingly agree that fundamental and structural changes to the way middle and high school education are organised are necessary to improve students' readiness for the 21st century, including postsecondary education and careers. Every aspect of the social order was subjected by technology, which is now and will be for a very long time the heart and soul of modern society today. It will continually change in order to meet the evolving requirements of society. The iGen, or people born in or after 1995, have a hard time imagining a world without technology. The education sector appears to be the most affected by the introduction of technological breakthroughs across industries. Since the beginning of learning and development, technology has actually played a significant role at the forefront of education, from the carving of symbols and figures on cave walls to Gurukul education, where students were taught how to use the technology available at the time, to the use of artificial intelligence (AI) and virtual reality (VR).

The idea that learning should be effective through a focus on students and their mastery of specific competencies, and by giving them technology assistance, rather than through outdated school structures and arbitrary, age-based benchmarks, is a key driver behind the integration of technology in education. Many school reformers concur that technology use and digital media have fundamentally changed all aspects of our lives and can and must play a significant role in current initiatives to personalise education.

Concept on Integration Technology

Integration of technology provides students to have an access to a range of tools that are appropriate for the work at hand and provide them the chance to develop a deeper understanding of the subject matter and that are engaging with technology on a daily basis . Another important prerequisite for successful technology integration is the ability to adapt to change. Technology is constantly and quickly changing. It requires continuing learning because it is a process. A wide range of digital devices, including computers, tablets, multi-touch screens, interactive whiteboards, mobile devices, cameras, DVD and music players, audio recorders, games, e-book readers, and older analogue devices, like tape recorders, record and

cassette players, light tables, projectors etc., are included in the definition of technology tools. . Technology is considered integrated when it seamlessly integrates into the curriculum or lesson plans of a teacher. As a result, rather of being a separate layer in the classroom, technology is included into the pedagogy and lesson plan design. The teacher creates the learning activities in this method, while the students use technology to create their own learning. For instance, students design, organise, and display their learning using computer applications. They also use technology to search for information. As a result, the teacher acts as a facilitator and the student as a constructor of his or her own learning. Such a strategy stresses the student's use of technology, authentic assessments and activities employing technology in the classroom, and views technology as a tool rather than an end in and of itself. It also defines the role of the teacher as a facilitator and designer of the learning environment (Grabe and Grabe cited in Charania, 2011).

"Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of how the classroom functions -- as accessible as all other classroom tools." (**National educational technology standards for students, international society for technology in education**).

This paper also provides an overview of the existing edtech innovation outside of higher education institutions by identifying the top educational start-ups acting as digital pioneers, by identifying innovative best practises, and by analysing these best practises using an adapted Business Model Canvas (BMC). This overview can help higher education institutions understand what is being created in this field and apply best practises to include edtechs into their teaching methods. There are numerous studies on how precisely higher education institutions are implementing edtechs in their organisations because not only institutions of higher learning but also governmental institutions are tackling the new trends and problems in higher education. While Orr et al. (2018) observe that the majority of the examined higher education institutions are still at the beginning of creating and adopting new technologies, Wannemacher et al. (2016) identify blended learning scenarios already in use.

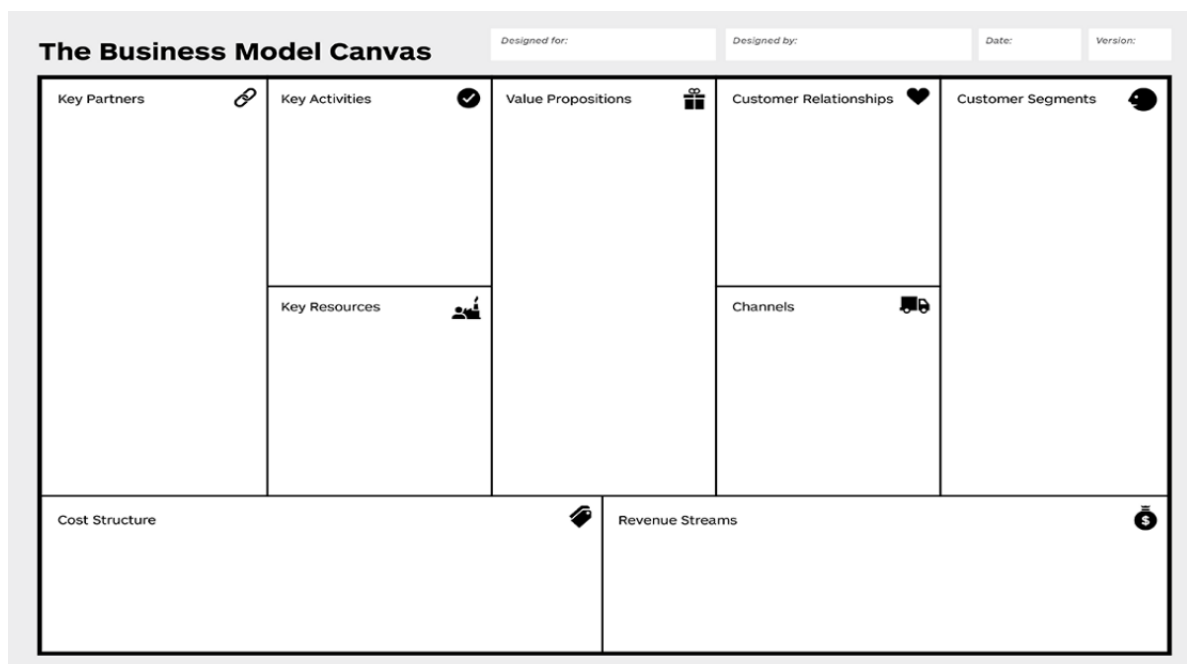
These two studies, which both compare and contrast various digital solutions, focus on those developed by higher education institutions themselves. According to Christensen and Overdorf (2000), organisations can adapt or acquire new business models in addition to new organisational skills or structures. It is crucial to consider startups tackling the new trends and difficulties in the education sector since the values, assets, and cost structures of start-ups "add up to the ability to embrace and even instigate disruptive change" (Christensen, & Overdorf, 2000, p. 7).

In contemplation to uncover cutting-edge best practises and present their business models, this study focuses on the research of various edtech start-ups that are functioning as digital pioneers in the field of education. To increase their ability and to adapt and integrate the business models offered, higher education institutions are given the opportunity to adapt and integrate the study's findings. This will help them become more resilient in the face of the digital revolution.

Conceptual Framework

The most crucial features of the listed start-ups are illustrated using a business model Canvas. The BMC developed by (Osterwalder, 2004) was used as a foundation because of its structure, which shows how an organisation develops, delivers, and captures value. Key partners, key activities, key resources, value proposition, customer relationships, customer segments, channels, cost structure, and income streams are the primary characteristics of BMC.

Main features on Business Model Canvas (BMC)



- The adaptation of BMC will most effectively represent the chosen edtech start-ups. This extension offers a better overview of the educational and technological components of edtech organisations and a more in-depth review of those organisations.
- The value proposition, or what an organization's product offers are, outlines the areas in which the good or service creates value (Cawood et al., 2018). Value propositions for edtech could be in the areas of teaching, research, higher education, organisation, and communication.
- The many groupings of people or organisations that an enterprise aims to contact and service are referred to as customer segments (Osterwalder & Pigneur, 2010). After that, customers can typically be divided into students, governments, or industry.
- For the key resources of business models, it is crucial to understand three key organisational characteristics: how the organisation supports the values offered (Cawood et al., 2018); whether the organisation places a focus on the technological product itself or on the service provided; and whether the organisation places a greater emphasis on higher education or on edtech (Wendler et al., 2017).
- The essential partners help deliver value, they can assume various responsibilities inside the organisation, and they can have diverse impacts.

In addition to what has been stated above, out of the original nine criteria mentioned it can be supplemented with a few more factors, resulting in a modified business model. These modifications make the model more appropriate for the edtech sector as well as the description and comprehension of organisations operating in this field. Therefore, In order to broaden the ability of the model, 'blended learning' has been considered as an additional criteria. Blended learning in short refers to the combination of online and offline education. It offers face- to- face in classroom setting as well as digital learning.

Emerging edutech startups in current scenario

In India, edtech startups are quickly becoming a significant business sector. India's education market is projected to grow to \$101.1 billion in FY19 from an anticipated 91.7 billion dollars in FY18.

Although there are numerous ed tech startups emerging in India, we have considered the top five ed tech startups that are currently emerging and changing the world regarding education scene in India as they have identified as innovative best practices. The adjusted BMC was used to give more specific information on these five start-ups. The information required to finish the BMC was obtained from the start-ups' own websites or on social media platforms like Facebook or LinkedIn.

Results

The business models of the identified edtech start-ups are described in the sections that follow.

1. Byju's

The company, originally known as Think and Learn Pvt Ltd, was established in 2011 with the aim of providing students with online classes. In 2015, "BYJU's The Learning App" was released. The business specializes in offering each of its users a customized learning experience based on their learning preferences and size. The software combines teachers, interactives, and films to make subjects come to life. Students use the app on a daily basis for about 40 minutes on average. The creation of a new self-paced and active learning part where students are encouraged to learn on their own with the use of information, media, and technology.

- Key partners: Several companies such as Tencent, Chan-Zuckerberg initiative, LightSpeed Venture Partner were impressed by BYJU's and have become key partners in it by investing huge amount of money in it.
- Key activities: Platform development, data centre operations management, IT infrastructure operations, and administering the learning community are some of BYJU's key activities.
- Key resources: Key Resources serve as a foundation for describing the most crucial resources required to support a business strategy. Some of the key resources of BYJUs include the technical infrastructure, interactive graphics technology, lecturers, servers, and IT infrastructure.
- Value propositions: The services, features, or innovations that make a company's product appealing to clients are known as value propositions. Some of the value propositions of BYJUs include accessibility to high-quality education, bringing quality teachers to every student, video distribution format, interesting curriculum, and retention.
- Customer relationships: Customer relationships outline the ways in which a business will interact with its clients in order to enhance the client experience. BYJUs builds relationships with its clients through conversations, direct meetings, online virtual classes, and mobile apps.
- Customer segments: The practise of segmenting a client base into groups of people who are similar in particular ways is known as customer segmentation. Students, parents, teachers, and other competitors are among the customer segments.
- Channels: The company offers its services to customers through channels. BYJUs pulls its content from Facebook, YouTube, the web, and a mobile app.
- Cost Structure: The types and proportional distributions of fixed and variable costs that an organisation incurs are referred to as cost structure. Web creation, upkeep, data centre, company operations, marketing, and sales, as well as general and administrative costs, are incurred by BYJU.
- Revenue Streams: A company's or organization's source of income is called a revenue stream. A revenue stream in business typically consists of one of the following: recurring revenue, transaction-based revenue, project revenue, or service revenue. Because BYJUs uses a freemium business model, the majority of its income comes from the membership fees that students pay to use the platform.

2. Toppr

Toppr operates under a freemium business model. On every subject covered in the syllabus, it provides free live and online lessons, concepts, and stories. However, a membership via a premium package is necessary to fully utilize the possibilities of this online learning programme. Students in class 5 through class 12 who are enrolled in the CBSE, ICSE, and IGCSE boards as well as more than 10 state boards can access Toppr to meet their educational needs. Additionally, they offer study guides for more than 20 admission exams in the sectors of engineering, business, and medicine. They also offer packages for several scholarship tests. Toppr awards scholarships to deserving students because it thinks that circumstances shouldn't stand in the way of learning.

Toppr intends to use its most recent investment to create the Toppr School Operating System, which will be based on artificial intelligence. With the use of this platform, schools will be able to digitally integrate both in-class and out-of-class learning to produce a standardised and customised experience.

3. Vedantu

Vamshi Krishna, Pulkit Jain, Saurabh Saxena, and Anand Prakash established Vedantu in 2011. Vedantu Innovations Private Limited is the company's owner. The explanation of their business model follows.

- Key resources: The calibre of the teachers and the technical team's skill set are the most crucial resources for the company. The flexibility of the professors to adapt and improvise based on the needs of the students, as well as their live engagement with the students, has greatly contributed to the development of Vedantu.

- **Key activities:** Vedantu's live classes and educational resources are the main thing moving the organisation ahead. In addition, they offer a variety of free courses and materials that are beneficial for students in grades 6 through 12 as well as those preparing for different competitive exams. The students can use these free lessons and materials as trial runs before deciding to subscribe to their paid services.
- **Value Proposition:** This EdTech company's personalised classes and live interaction are among its key selling points. As opposed to its rivals' pre-recorded classes, it makes care to employ qualified instructors who can create superior teaching strategies based on the needs and perspectives of the students. This distinctive customization includes video, two-way audio, white board technologies, and other things. Students who are prepared for competitive exams frequently use this start-up.
- **Cost Structure:** Vedantu, like other offline functioning businesses, must spend a lot of money. Depending on their expertise and the courses they contribute to the platform, the corporation spends a significant portion of its revenue on the teachers. Over 1300 employees, including the teachers, work for the company, and their pay must be paid. Vedantu relies heavily on marketing and advertising, which also consumes a significant portion of their income.
- **Revenue Stream:** Vedantu only has one source of income, which comes from their subscription business model. It is safe to assume that this start-up connects to its customers via a B2C model. Business to consumer is referred to as B2C.

According to their class, course, length of the course, etc., they charge students a particular fee under the subscription model. These plans come in a wide range and are therefore affordable. You can select one based on your requirements. They also offer a lot of demo lessons to further establish trust and guarantee excellence.

4. Unacademy

Unacademy employs both B2C and B2B business models (business to business and business to customer, respectively). Whereas the majority of their income is derived from the premium memberships they provide. Unacademy features a freemium business strategy as well. where it charges a monthly fee to access all of its services and some of its content for free, even though no advertisements are displayed.

Plans for Unacademy Subscriptions

- Nearly 100,000 people subscribe to Unacademy Plus, which offers paid educational programmes. The main source of income for Unacademy comes from these paid subscriptions.
- **Learning Resources** - Unacademy provides students with access to a variety of learning resources to help them learn.

Unacademy Revenue Model With Its Revenue and Growth.

1. **Subscription Plans:** Every course at Unacademy is free and comes with recorded video lectures on a range of subjects. However, with a premium subscription known as Unacademy Plus, it provides paid live classes for clearing up confusion and providing appropriate lectures. A small number of practise exams are supplied for free, although occasionally some quizzes and tests may have a fee attached. All study materials and lecture recordings, however, are available for free. The majority of Unacademy's business model is made up of these "paid live lectures."
2. **YouTube Channels:** Unacademy offers more than 20 YouTube channels, with distinct channels for various topics. For example, they have Unacademy JEE and Unacademy NEET. Few channels have more than 1 million subscribers, and the vast majority have 100k subscribers and more than 3 billion views combined.

Unacademy acquisitions: Unacademy, a Facebook-based company, has so far purchased 12 businesses to improve its position in the Edtech Sector. Swiflearn was the final acquisition, and Unacademy purchased it on November 3, 2021. Prior to being acquired by Graphy on October 11, 2021, the company had previously purchased the Edtech SaaS platform Spayee, which was financed by Unacademy.

5. UpGrad

Since its founding in 2015, UpGrad has established itself as the largest provider of higher education in India. Through a variety of programmes in technology, law, data science, and management, UpGrad provides higher education. The kids are not required to meet any standards. Anyone can enrol in these programmes, from academics to working people.

- UpGrad- Business Model and Revenue Model: The direct B2C business model that underpins much of UpGrad's operations allows customers to enrol in the programme after being admitted and pay the registration fee up front. The corporation gets paid by businesses for the training of its personnel for its enterprise business. The cost of upGrad's programmes demonstrates its dedication to placing students. Only if the student is placed after the program's conclusion will they be required to pay 50% of the programme fees. The pricing scheme used here is a novelty for India.
- UpGrad- Funding and Investors: The initial money was given by the creators of upGrad. The first stage of the investment was spent on developing the curriculum, learning experience, and product. The second round of the investment aims to raise consumer and corporate awareness on a wider scale.

On August 8, 2022, upGrad closed a \$210 million funding round, with contributions from family offices of Bharti Airtel, Narotam Sekhsaria (Ambuja Cements), and Lakshmi Mittal, as well as ETS Global, Bodhi Tree, and Kaizen Management Advisors. Additionally, Temasek, IFC, and IIFL—previous investors—supported Grad with this round as well.

- Upgrad- User Acquisition: UpGrad promoted their programme with a number of offline events for the first 100 customers. The founders addressed the students directly. Before joining, prospective students had to submit their video profiles and SOPs (Statement of Purpose). Then, they received two weeks' worth of cost-free educational material. The payment option wasn't made available to them before they had a chance to experience the free content.
- Upgrad- Competitors

The ed-tech sector is surrounded by several competitors, just like any other industry. However, UpGrad is quite fortunate in terms of the competition it encounters from different firms in the sector. This is all the result of them using a distinctive selling proposition. It is a pioneer in providing a broad range of accredited degree programmes in collaboration with numerous reputable institutions. And this functionality is both original and cutting-edge. Due to the closing of numerous physical classrooms as a result of global pandemic conditions, UpGrad also increased in popularity. Likewise, a large number of people enrolled in a variety of specialisations to advance their careers and talents.

Discussion

The purpose of this study was to examine startups and show the business models of new best practises among the startups in order to provide an overview of technology integration and advances in edtech. Out of the total start-ups, five unique best practises that address the emerging trends and difficulties in higher education were found. The disruptive potential of edtechs has made resilience and the need for change in established institutions more vital than ever, making this analysis particularly significant for higher education institutions. The best practises demonstrate how some emerging issues and trends in higher education are being handled in creative ways that stand out as examples of how to use edtechs to improve teaching and learning in that setting. It also shows a trend toward student-centered teaching because the best practises are primarily focused on improving student performance and knowledge acquisition rather than maximising institutional resources and structures or even academics' research workloads. Further, Blended learning as a modern educational strategy should be evolved from e-learning as it helps to deliver better results at a lower cost as compared to the traditional learning methods. It also aims at interactive learning, resulting in the blending or mixing of a teacher's role in a traditional classroom with that in the virtual one. The success of the NEP 2020, which aims to transform India's educational system on all levels, depends on the initiative and methods used to carry it out. It is clear that the government cannot accomplish this on its own. When they require help, India's EdTech startups steps in. With the introduction of platforms like SWAYAM, an Indian Massive Open Online Course (MOOC) by the Government of India, the trend toward blended learning is quickly catching up. In addition, educational institutions are required under the National Education Policy (NEP) 2020 to create their own online courses to support traditional classroom instruction.

Theoretical and Practical Implications

The discoveries that have been presented add to the body of edtech research and have a number of applications in higher education. New educational methods are replacing outdated ones thanks to disruptive technologies, which is forcing the conventional higher education establishments to adapt. This study is the first of its kind to provide an overview of current start-ups in this industry rather than only a

list of potential edtechs. Higher education institutions can gain knowledge and independently adapt or integrate new organisational structures or capabilities thanks to the presentation of start-ups with the updated BMC.

In general, higher education institutions can use the research's findings to acquire a general understanding of current edtech industry practises, learn how to address emerging issues and trends, and maximise the many benefits edtech can offer. Additionally, by responding to the potentially disruptive technologies that may affect this industry, higher education institutions can reform or adapt their business models and increase their resilience.

Conclusion

Education is key to unlocking the benefits of India's demographic dividend. The cost and reach of education for all are issues that can be addressed by adopting technology. Further, the COVID-19 pandemic has already highlighted the need for technology in the Indian education system. At present, technology in education, in India, focuses on content delivery, but other support functions such as admissions and content management are also expected to be enabled by EdTech soon. However, many EdTech firms in India operate on a SaaS-like model, thereby making scale-up critical for their success. Technology companies in India must go outside the top two quintiles, innovate to differentiate themselves, and expand into adjacent markets in order to succeed when scaling up. Additionally, this will make it more likely that ecosystem enablers like infrastructure and telecom service providers would succeed and draw in investors. Through the NEP 2020, the government has already shown that it is committed to enabling the education sector through technology. Smart boards, computing devices, adaptive computer testing for student development, and other types of educational software and hardware will be integrated into all levels of education through the technology forum to improve classroom processes, support teachers' professional development, increase educational access for disadvantaged populations, and streamline educational planning, administration, and management. As per National Education policy (NEP) 2020 the National Educational Technology Forum (NETF) will also facilitate in providing educational institutions, governments, and other stakeholders the most recent information so that they can consult and share the best practises about the introduction, deployment, and usage of such technologies. The expansion of opportunities for Edtech firms to close the education gap in the country may turn out to be a boon for the Indian Edtech sector.

The emerging themes and issues in higher education, as well as the selected edtechs addressing these issues, demonstrate the rapid change taking place in this industry and the emergence of potentially game-changing innovations. The analysis of established startups in the study life cycle and the business models of cutting-edge best practises are both enhanced by this research. Most importantly, the research shows that the edtech business is developing quickly, particularly in the school sector, which is increasing the demand for change and adaptation. This change requires traditional higher education institutions to examine and modify their business models in order to survive in a potentially disruptive environment.

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