

A review about the Process behind Educational Mobile Applications Development and Evaluation

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Abstract: This paper is a review about the process behind Educational Mobile Applications development and Evaluation. The types of Mobile applications, the steps behind App development, main features to be kept in a mobile application, the process of Evaluation, the steps in evaluation, various scales available for evaluations, the security issues to be taken care of in Mobile Application are reviewed.

Introduction

Mobile applications (apps) have assimilated into daily life in the modern world. Mobile applications have become effective teaching, learning, and assessment tools, and the educational sector is no exception. Students, professors, parents, and even administrators are using educational mobile apps more and more to boost the calibre of instruction and learning. The interesting and expanding industry of mobile app development has completely changed how we engage with technology. The market for mobile apps is expected to grow quickly and generate \$101.37 billion in global revenue by 2020. (Statista, 2019). As mobile device technology continues to grow, more and more companies are turning to the creation of mobile apps as a means to interact with their clients, boost productivity, and enhance customer service.

Processes behind development of Educational Mobile Applications

As mobile devices, such as tablets and smartphones, have become more accessible and capable, the creation of instructional mobile applications has increased in frequency. Mobile learning applications now have a tonne of promise as a result of this. A lot of actions need to be done in order to design a successful educational mobile application.

The identification and evaluation of the target audience is the first step in the development of educational mobile applications. It's critical to comprehend the audience's educational wants as well as the educational objectives that the application should support. This is crucial for choosing the features that should be included in the application and are of the utmost importance (Feng & Liu, 2019).

The next stage is to build an approachable layout. Users are likely to be less accustomed to the programme than they are to conventional educational tools, thus the design should be simple to use. Additionally, it must be visually beautiful and captivating. This will help to improve user engagement and make the application more pleasurable to use (Feng & Liu, 2019).

The development team should concentrate on building the application's functionality when the design is finished. This needs to have elements like tests, interactive activities, and feedback systems. It's crucial to confirm that the application can deliver the essential instructional information and enable meaningful user interaction with the content (Feng & Liu, 2019).

The back-end system should be developed with reliability and security in mind by the development team. This is crucial for defending the application from harmful assaults and guaranteeing the privacy of user data. Since

educational apps are frequently used by a big number of users, it is also crucial for the back-end system to be able to accommodate a large number of users (Feng & Liu, 2019).

Testing the app is the last step in creating educational mobile applications. This is crucial to verifying that the app is working properly and that the target audience's demands are being met. Both usability testing and performance testing should be conducted during the testing process (Feng & Liu, 2019).

The development team should launch the programme after testing is finished. To ensure that users are aware of the application's existence and can access it, this should involve marketing and promotion of the programme. For users to have access to the most recent version, it is also crucial to make sure the programme is routinely updated and maintained (Feng & Liu, 2019).

It takes careful preparation and execution to complete the difficult process of creating educational mobile applications. It's crucial to comprehend the target audience's requirements and develop a user-friendly design. Additionally crucial are the development of a solid back-end infrastructure and a careful testing of the application. The application should then be released and advertised in order to let users know about it and give them access to it.

Different Mobile Apps

Depending on the app's function and the platform it will be distributed on, there are various sorts of mobile apps that can be created. The following are the top three categories of smartphone apps:

Native apps are those that are created specifically for a given platform, such as iOS or Android.

Native apps are created with the platform's unique language and frameworks and made accessible for download in the app store.

Apps that can be accessed through a web browser, such as Chrome or Safari, are referred to as web apps. They are not accessible through the app store and were created using HTML, CSS, and JavaScript.

Apps that combine native and web functionality are known as hybrid apps. They can be found in the app store and were created using web technologies.

Process for Developing Mobile Apps

The process of creating a mobile app involves a lot of planning, designing, developing, testing, and launching. The procedure is divided into four separate steps:

1. Ideation: This is the first stage of creating a mobile app, and it entails coming up with ideas for the app. The user experience, target market, platforms on which the app will be distributed, features that will be offered, and the app's general style and feel must all be taken into account by the app developer at this phase.

In step two, design and development, the app is really constructed. This step involves designing and developing the app utilising a number of different programming languages and frameworks. Additionally, the app will be examined for functionality.

3. Testing: A team of testers tests the app at this step to make sure there are no bugs or problems and that it is operating correctly. This guarantees that the programme is prepared for release, making it a crucial stage.

4. Start: The launch of the app is the last phase. In this step, the app is submitted to the app store, analytics and tracking are set up, and a marketing campaign is started to advertise the app.

The following steps should be included in the software design and development process:

- Defining the intent and goals of the application
- Determining the user needs and target audience
- Creating a user interface and a software architecture

Creating a user experience and user interface, testing the application, and putting it into use are all steps in the process.

Design and Planning

Planning is done carefully before an instructional mobile app is created. This entails determining the issue that the app is meant to solve, such as a lack of access to educational resources or a demand for a more effective method of evaluating student achievement. The development team must choose what features and functionality the app should have after the issue has been located. Making choices at this point also affects the user interface and user experience. The developers can start building the actual app after the design is complete.

Application Development

The process of developing software includes writing the code and algorithms for the application. Numerous programming languages, including Java, JavaScript, and HTML, can be used to accomplish this. The development team is responsible for making sure the code is organised, effective, and secure. They should also think about how the app will work with other mobile applications and hardware at the same time. The developers can start testing the app once the coding is finished to make sure it complies with all specifications.

User testing

User testing helps developers find any problems with the app before it is made public, making it a crucial step in the development process. Giving the app to a set of users and asking them to use it and give feedback are both part of this stage. The app can be modified or improved as needed as a result of the feedback.

Deployment

The app is prepared for deployment once it has through testing and received approval. This entails placing the app in an app store or other website where users can download it. To keep the software current with the newest features and improvements, regular updates are required.

Evaluation

The evaluation of the app is the last step in the development process. This entails gathering information on the app's usage and effectiveness in reaching its goals. If necessary, this information can be utilised to improve the software. The developers might use it to find any potential problems or opportunities for development.

Evaluation of Educational Mobile App Effectiveness

Both the user experience and the learning outcomes of the application should be taken into account when evaluating the efficacy of educational mobile applications. To this purpose, a variety of scales and techniques are already in use for evaluating the efficacy of educational mobile applications. User experience scales, learning result scales, and hybrid scales are the three basic categories into which these measures can be generally divided.

Scales for User Experience

The user interface, usability, and accessibility of the programme are the main topics of user experience scales. The Mobile Application Rating Assessment is the most widely used user experience scale for educational mobile applications (MARS). The MARS is a seven-point Likert scale that was created to evaluate many aspects of mobile applications, such as design, usability, and accessibility. A number of mobile educational applications, including those for learning languages and math, have had their user experiences evaluated using the MARS.

Scales of Learning Outcomes

Assessments of the application's effect on student learning are the main focus of learning outcome scales. The information, abilities, and attitudes that students gain from using the programme are often measured by these

scales. The Cognitive Apprenticeship Model is a typical learning outcome measure for educational mobile applications (CAM). To assess how educational mobile applications affect students' learning results, the CAM is a seven-point measure. The effectiveness of educational mobile applications has been evaluated using the CAM in a number of domains, including language acquisition, arithmetic learning, and science learning.

Adaptive Scales

User experience and learning outcome scales are both included in hybrid scales. Both the user experience and the application's learning objectives are gauged by these scales. The Mobile Application Usability and Effectiveness Scale is the hybrid scale for educational mobile applications that is most frequently utilised (MAUES). The MAUES is a nine-point scale that was created to evaluate the learning outcomes and user experience of mobile educational applications. A range of educational mobile applications, including those for learning languages and math, have been evaluated using the MAUES for both user experience and learning results.

Scales for Measuring the Effectiveness of Educational Mobile Applications

To gauge how well educational mobile applications are working, various measures have been created. These scales can be used to evaluate the applications' effects on student learning, engagement, and general satisfaction (Kumar, 2017). A list of some of the scales created for this purpose is provided below.

The Rating Scale for Mobile Applications (MARS)

The 20-item Mobile Application Rating Scale (MARS) was created to assess the potency of educational mobile applications (Al-Harthy et al., 2017). Usability, content, and impact are the three subscales that make up the scale. Each subscale has seven items that are used to assess how well the application is deemed to be working in terms of interacting with the user, delivering instructional content, and involving the user in the learning process (Al-Harthy et al., 2017).

Scale for Mobile Learning Evaluation (MLES)

The 15-item Mobile Learning Evaluation Scale (MLES) was created to evaluate the efficacy of educational mobile applications (Lee & Lee, 2016). Usability, content, and impact are the three subscales that make up the overall scale. Five items make up each subscale, each of which is intended to assess how well the application engages the user, provides feedback, and instructive content (Lee & Lee, 2016).

The Scale of Mobile Learning Effectiveness (MLES)

The 20-item Mobile Learning Effectiveness Scale (MLES) was created to evaluate the efficacy of mobile educational applications (Goh, Cheah, & Tan, 2014). The scale has four subscales: impact, engagement, usability, and content. Five items make up each subscale and are intended to assess how well the application is judged to be at engaging the user, offering educational content, and providing feedback (Goh et al., 2014).

The revised Mobile Learning Evaluation Scale (MLES-R)

A 15-item scale called the Mobile Learning Evaluation Scale-Revised (MLES-R) was created to evaluate the efficacy of educational mobile applications (Choi & Lee, 2017). Usability, content, and impact are the three subscales that make up the scale. Five items make up each subscale, which is used to assess how well the application is thought to work in terms of delivering educational content, interacting with users, and involving them in the learning process (Choi & Lee, 2017).

Security

The creation of educational mobile applications must include security. The programme should be created with security against hostile assaults, as well as privacy and data protection for the user. The following actions should be made to guarantee the application's security:

- Authentication: Prior to using the application, the user should be requested to verify their identity.

- Data encryption: To prevent unauthorised access, the user's data should be encrypted.
- Secure storage: To guard against unauthorised access, user data should be securely stored.

The development of educational mobile applications has the potential to revolutionise education, making it more accessible and engaging for learners. The portability of mobile devices and the ability to access a wide range of content anytime, anywhere has made educational mobile applications an attractive option for a variety of educational institutions. The use of educational mobile applications allows educators to create personalised learning experiences for their students, leveraging the power of technology to create interactive, engaging and immersive experiences. Furthermore, these applications provide an enhanced level of collaboration and communication between students, teachers and parents, making it easier to manage learning.

However, it is important to note that the development of educational mobile applications is a complex process, requiring careful consideration of the various factors and features that will go into their design. It is also important to consider the cost of development, as well as the time and resources needed to bring the application to market. Additionally, the effectiveness of the application depends on the quality of the content and the user experience. As such, it is important to ensure that the development team is familiar with the target audience and the learning objectives and has the necessary skills and resources to create a successful application.

Conclusion

Developing an effective and engaging educational mobile application requires careful consideration of the unique requirements and challenges that such applications present. This article has provided an overview of the key requirements for educational mobile application development, including software design and development, user interface design, user experience, and security. By following these guidelines, developers can create a successful and effective educational mobile application that will provide users with an engaging and interactive learning experience.

Measuring the effectiveness of an educational mobile application can be a challenging task. However, by using a combination of quantitative and qualitative measures, it is possible to gain valuable insight into the effectiveness of the application. Metrics such as the number of downloads, frequency of use, and amount of time spent using the app can provide objective data on the effectiveness of the application. Additionally, surveys, interviews, focus groups, and classroom observations can be used to gain subjective data on the effectiveness of the application. By using these various measures, educational organisations can assess the effectiveness of their mobile applications and work to improve the learning experience for their students.

This article has discussed some of the scales that have been developed to measure the effectiveness of educational mobile applications. These scales may be used to assess the impact of such applications on student learning, engagement, and overall satisfaction with the application. The scales discussed in this paper include the Mobile Application Rating Scale (MARS), the Mobile Learning Evaluation Scale (MLES), the Mobile Learning Effectiveness Scale (MLES), and the Mobile Learning Evaluation Scale-Revised (MLES-R). These scales provide a useful tool for assessing the effectiveness of educational mobile applications and can be used to guide the development and improvement of such applications.

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