# How Mobile Solutions Impact the Education in Universities

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*The rapid advancement of technology and the push toward digitalizing the educational system have led higher education institutions to explore mobile solutions as alternatives to traditional study methods. These mobile applications aim to enhance the university experience by offering instant access to educational resources and simplifying the management of academic processes. This paper seeks to explore the range of existing mobile learning applications, focusing on their functionalities and user experience. Additionally, the study examines how these educational apps impact students' academic lives, specifically looking at factors such as academic performance, productivity, engagement, and social interaction. The research adopts a methodological approach centered on collecting statistical data regarding the adoption of mobile solutions in the academic sector. Results indicate a growing use of mobile applications at the university level, primarily due to their portability and the quick access they provide to educational materials. The study also reveals a positive impact on both students and faculty, enhancing communication and interaction from both an educational and social perspective.*
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## 1 Introduction

A study made in 2014 shows that 89% of the time spent on the smartphones is used interacting with different applications and 11% is spent on mobile Web [1]. This means that in the last years more and more users used different mobile applications, from games, finance, sports, social applications and even education.

In the last two years people worldwide were forced to use different devices to connect with others because of the COVID-19 pandemic. To this problem many solutions appeared on the mobile marketplace. Most of them were for education since the students from all levels of education were forced to stay at home to continue their studies. In this paper it is presented some alternatives that the students from universities had to improve their learning and some statistical data will be presented in the next chapters about the use of mobile solutions in the academic field. Also, the impact of the mobile solutions on students and professors can be observed both from a didactic and social point of view.

## 2 Mobile applications used in universities

After the start of the COVID-19 pandemic many universities switched to online learning, and they needed to use different web applications or mobile applications to continue the studies. At the middle of 2020 in America at the fourth annual "Appademy Awards" were presented the best mobile applications used by the students in different universities around all America. At the event were presented mobile applications that had different features like recruiting and admissions, health and wellness, campus marketplace, student engagement, communication, personal development, visual designing, and many others. These mobile applications are used in universities like Northern Arizona University, University of California, St Francis College, University of Houston, San Francisco State University, Illinois College, University of Akron, Ontario Tech University, Ivy Tech Community College, Penn State University, Swinburne University, and many others [2].

In the following paragraphs I will present the advantages of some the apps used by the above universities and how the life of students has improved after using them.

University of California, San Francisco won the award for the best app for recruiting and admissions by created an application called

UCSF Mobile which transformed their "Accepted Students weekend" into a virtual event. The number of attendees exceeded expectations, even over traditional in-person attendance and brought the traditionally in-person weekend to life, virtually, for 140 accepted students [3].

Northern Arizona University won the award for the best health and wellness app that provides to their students the possibility to talk to a health professional, biking on campus, counseling, workouts and more [2] [4].

California State University, Northridge won with the app CSUN the award for the best campus marketplace that cross the campus collaboration with the university food pantry, sustainability department, and IT provides students access to donated resources for everyday college life through the campus mobile app [2] [5].

University of Akron created the app UA Mobile which won the award for the most innovative app for communication that allow students to attend an event by filling out a survey with their name, email and auto-submits the time-stamped survey. They will get a personal push notification confirming they've been checked into the event and providing any optional links to additional resources or a post-event survey [2].

University of North Carolina Greensboro made an application called UNCG Mobile where virtual events can take place and empowers students to stay informed. They also leveraged cross-department collaboration and crowdsourced their virtual campus tour's content from their student leaders for attracting and retaining new and prospective students. They have built a distributed digital campus experience [2] [6].

For the category 'New Student Orientation' the university of Central Florida won with the application UCF Mobile the best prize [7]. The application increases the student engagement by providing content and functionalities that help students during their first week as UCF students. They used Modo's Quick Polls, Photo Stories and targeted communications to successfully promote school spirit, gauge excitement and prepare students for their UCF life [2].

In the below picture you can see an overview of how some of the apps presented above looks like.

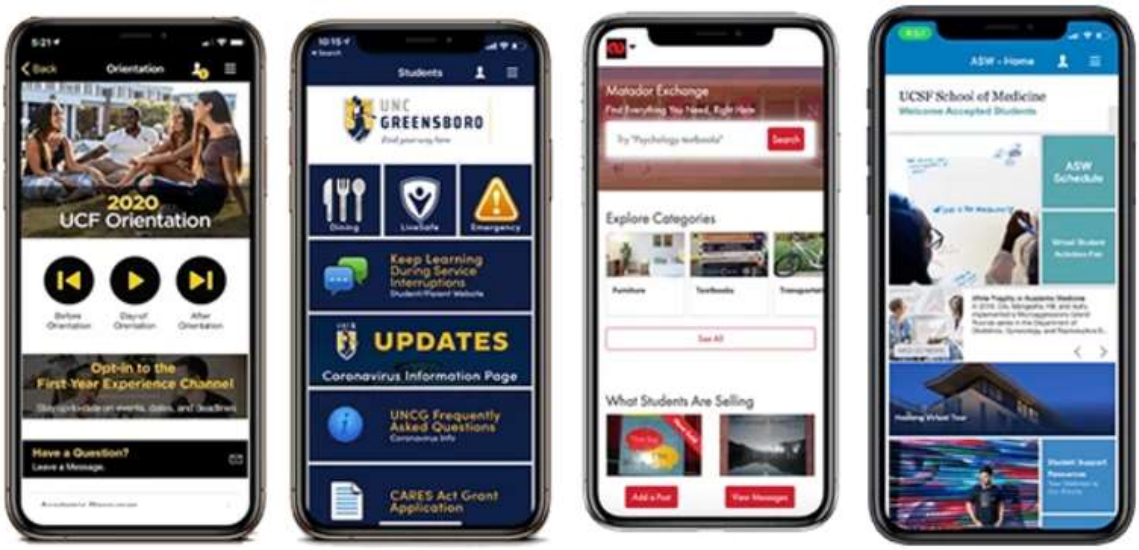


**Fig. 1.** Applications used in universities that won different prizes at the fourth annual "Appademy Awards" in America [2]

What we can conclude from the above analysis of the best applications that won awards at "Appademy Awards" is that students from different universities used these apps because they have considered that it was important for them to keep the connection with others while

studying from home, to stay informed, improve their exam results and become more productive [8]. They intensively have used applications that had virtual events to socialize, applications for their mind and body about health and wellness, campus marketplace, student engagement, personal development, and many others. This shows how important these mobile applications were for them and they are still using them since it offers so many opportunities.

**3 User Experience**

When it comes to user experience, this is an important indicator to be taken into consideration when talking about the m-learning solutions. According to Hartson and Bella [9], user experience reflects the effect felt by an user due to the interaction with a system, device or product during and after the experience has taken place, through the reflection of memory. It is mirrored through usability, usefulness, and utility impact.

The mobile solutions used in the learning educations were first designed to overcome constraints such as place and time and to complement the traditional learning process. Next to this, the factors of the user experience began to gain more and more importance, with the progress of information technology.

Every such system must provide satisfaction and to inspire trust. Based on the literature review studied by Dirin [10] in his thesis, there are several indicators that can be used to evaluate the user experience for a proper adjustment: satisfaction, delightfulness, reliability, and adjustability.

Satisfaction will reflect the opinion regarding the experience with the learning solution and it constitutes a bridge between usability and user experience. This can be influenced by aspects such as computer anxiety of the learner, the attitude towards using the electronic environment, teacher`s opinion regarding the usefulness of the method and other. Therefore, there are a lot of factors that can contribute to forming a certain opinion about m-learning and the mobile application itself. Anyway, constantly evaluation of the user experience is an important factor in measuring success of the m-learning as a process and in providing the needed input to constant improve the application or the platform through which the learning content is provided. There are some authors that assess the success of the m-learning from the perspective of the user, given the fact that a strong dissatisfaction with the application will influence the user in a negative way and the decision to use the application furthermore. Through the factor that would contribute at a main level to the user satisfaction with the application can be mentioned: the content provided through the application, the usability and easefulness in accessing it, the system assurance, the service commitment, and the membership of the community.

Delightfulness it is the considered to be one of the factors contributing to the customer loyalty. A pleasant experience when using an electronic learning solution will maximize the learning, especially for young users. Any activity that will provide joy is linked at a cognitive level with a delightful experience and the learning process is therefore strengthened. It will of course motivate and encourage the users to learn with enthusiasm and a positive attitude towards learning. For example, in traditional learning, for children, the learning of a foreign language is often linked to fun and interactive activities. The more features an application might have, to provide positive and pleasant activities for the learners, more likely is for those users to be motivated and encourage to pursue with their learning process.

Reliability, as a third factor of influence when assessing the user experience with m-learning, relies on design attributes such as information accuracy and system reliability. In today`s world, which is subject to so many changes, where information is spreading at an unprecedented rate, it is important that applications used in learning processes can deliver accurate, actual information and that the entire system is reliable. The application itself must provide a secure framework, for the m-learning to be entirely assessed as reliable, accurate and valid.

The fourth aspect, the adjustability, maybe one of the most important factors for the user, reflects the potential to customize the m-

learning system to meet the continuously changing needs of the user. Adjusting the "company product" according to the customer`s needs is the main pillar among the marketing specialists. To have success, any product must meet the customer`s expectations and to have the ability to adjust according to the needs. Every human is different from another, and even the needs of a person vary from on moment to another, that is why it is important for the m-learning solutions as well to provide this feature. Adjustability is the key. The application should allow for constant changes and optimization to the program, even after the launch.

Constant evaluation of the user`s experience began to gain more importance and to constitute subject of more focus among of the specialists.

**4 Mobile learning in Romanian universities**

In the following chapter are presented the results of a survey conducted by me which is addressed to the students from the Bucharest University of Economic Studies from the bachelor's degree and master's degree from the faculty of Cybernetics, Statistics and Economic Informatics about the mobile learning in the university from the last two years.

The survey was addressed to 941 responders as seen in figure 2 from which 582 (61.8%) were females and 359 (38.2%) males. From the total of the responders 789 (83.8%) were from the bachelor's degree and 143 (15.2%) from master's degree.

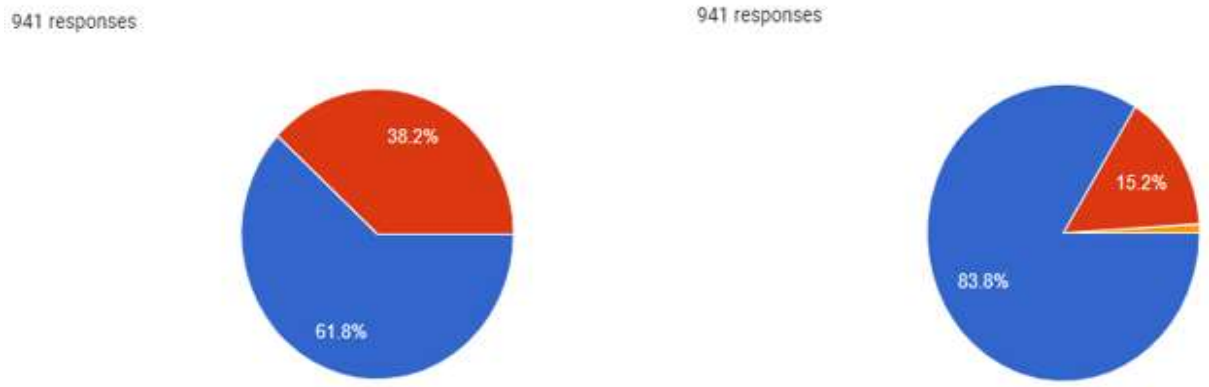


**Fig. 2.** Gender of responders and their degree level

In figure 3 it can be seen what the students answered when they've been asked if they gained with the online learning the same knowledge as the learning when present at the university. It seems like the opinions were divided, 244 students (25.9%) were undecided about this topic and 178 (18.9%) truly believe that they have learnt more in the online format, but at the opposite side are 150 students (15.9%) that said that they've learned less in the online format.

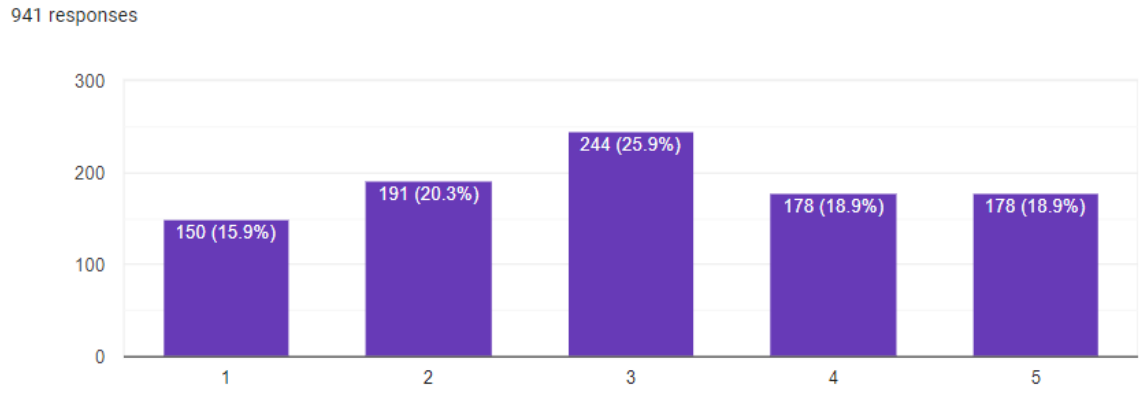

**Fig. 3.** How students compare online learning vs traditional learning

In the next figure, the students were asked if mobile applications should be used in the university for learning. Most of them agreed with this, 373 (39.6%) totally agreed, 275 (29.2%) agreed, 222 (23.6%) were undecided and only 25 (2.7%) didn't agree at all.

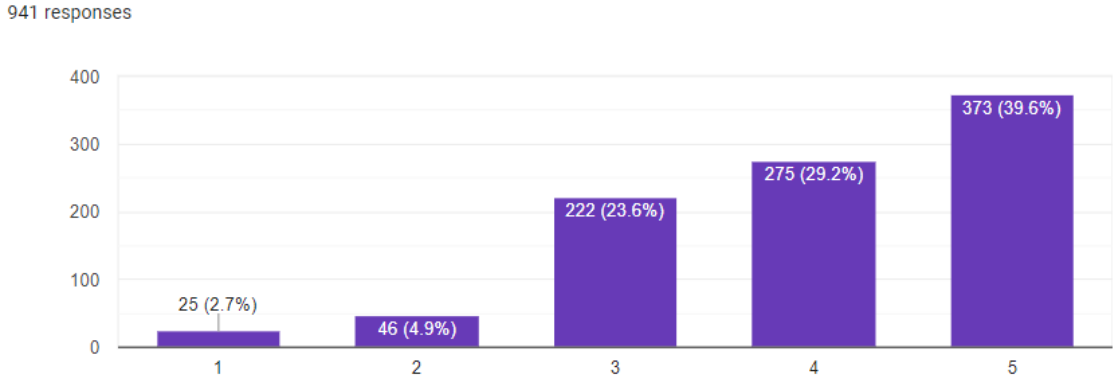


**Fig. 4.** Should mobile applications be used in university for learning

In Figure 5 the responders were asked if their university should use more apps for learning. Most of the answers agreed with this affirmation where 306 (32.5%) totally agreed, 278 (29.5%) agreed and 252 (26.8%) were indifferent. At the opposite side only 27 (2.9%) students said that the university should not use more apps for learning.

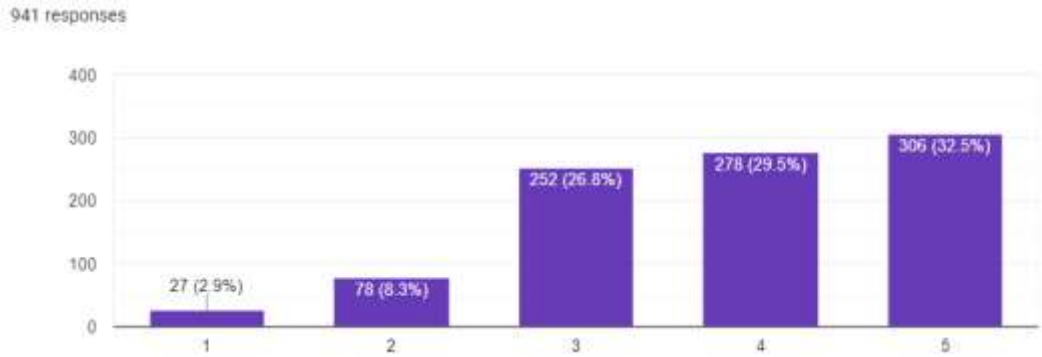


**Fig. 5.** Should the university use more mobile applications for learning

To see what the preferences of the students are when it comes to online learning in figure 6, we can see that the opinions are divided. Only 169 (18%) students totally agreed with the use of the mobile applications instead of the electronic applications and 222 (23.6%) agreed with the use of mobile applications. Most of the answers were uncertain 339 (36%). At the opposite side only 57 (6.1%) and 154 (16.4%) would prefer more the electronic applications instead of the mobile applications.

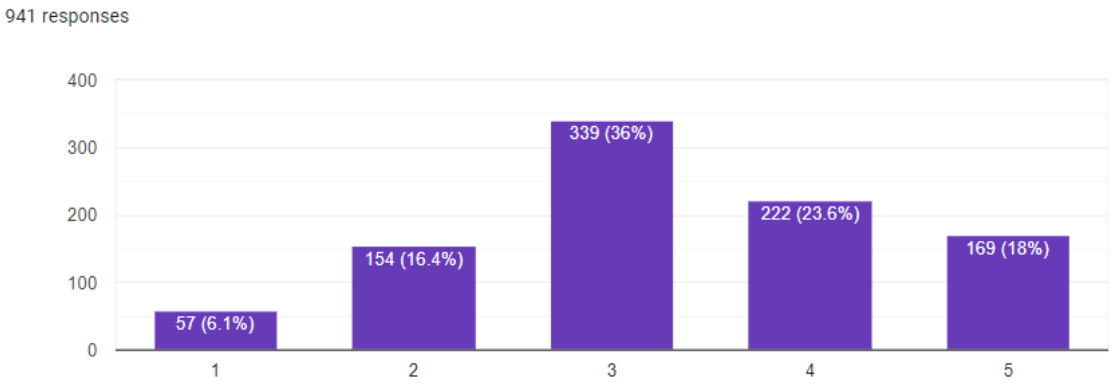


**Fig. 6.** Should the university use more mobile applications for learning

In figure 7 the students it has been asked if the students can concentrate at courses when using mobile devices. The responses were equally divided. From the 941 responses, 199 (21.1%) totally agreed that they can concentrate at courses, 222 (23.6%) agreed, 225 (23.9%) were uncertain, 207 (22%) disagreed and 88 (9.4%) totally disagreed.

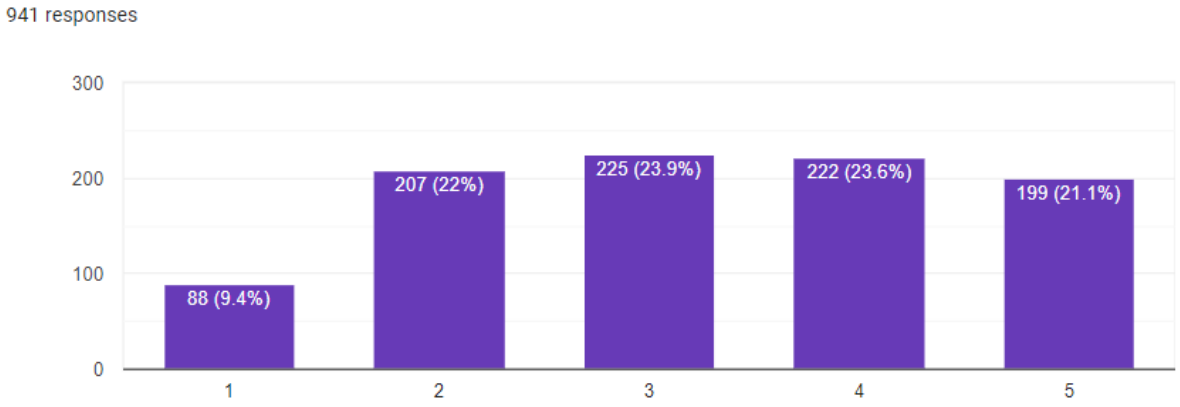


**Fig. 7.** Can the students concentrate at courses when using mobile devices?

Lastly, the students were asked if the mobile solutions can be an alternative to traditional learning. As seen in figure 8, they mostly agreed with the comment, 199 (21.1%) totally agreed, 285 (30.3%) agreed, 280 (29.8% were uncertain), 132 (14%) disagreed, 45 (4.8%) totally disagreed.

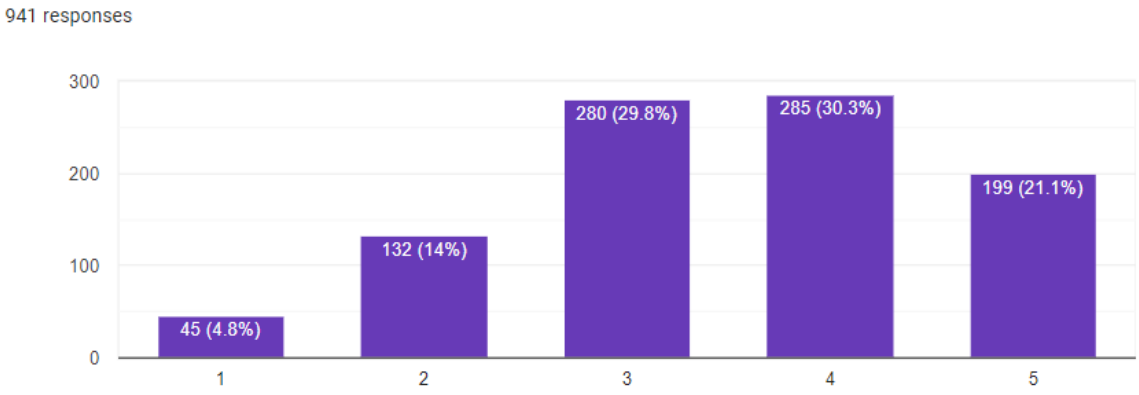


**Fig. 8.** Can the mobile solutions be an alternative to traditional learning?

What we can conclude after asking 941 responders is that the mobile solutions should be used in universities, and they can be an alternative to the traditional learning if needed.

## 5 Conclusions

The shock of the COVID-19 pandemic on education was unprecedented. Globally, it has blocked the goals of international education, but the educational community resisted and began the process to return to normality. Multiple mobile solutions for education appeared on the market to help students from different levels of education to continue their studies.

In this paper we analyzed different mobile solutions used by students from different universities worldwide and the conclusion was that those applications made the life of the teachers and students easier. The solutions offered the possibility for them to interact with each other in virtual events, it provided solutions for health and wellness, campus marketplace, guides for students that were in the first year at that university, and many others.

It the second chapter it was presented the literature review that was about the importance of a good user experience for students that use mobile solutions for learning and how important it is to create a solution that has a great user experience.

In conclusion, we can say that existing mobile and web solutions currently have a strong impact on the education system and can change the future of education worldwide. Although it was initially considered an alternative to the traditional education system, it has proven to be one of the few solutions to further the educational process, although there is a full range of students who have not benefited from online courses, mainly due to infrastructure restrictions.

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