












WhatsApp as a technological tool in the learning of higher education

[WhatsApp como herramienta tecnológica en el aprendizaje de la educación superior]

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Resumen

El avance tecnológico ha trascendido en la comunicación, en inmediatez, en envío de materiales audiovisuales y escritos, la interacción e interactividad en cualquier lugar del mundo. Motivo, que se investigó la eficiencia de WhatsApp para el aprendizaje en la educación superior. El objetivo fue determinar si existe correlación entre la utilidad del aplicativo y mejora del aprendizaje. La metodología se basa en descriptiva, la muestra representativa fue 20 estudiantes; por lo que se elaboró los cuestionarios ¿Cada qué momento revisa los mensajes de este aplicativo durante el día?, ¿Es eficiente la recepción y almacenamiento de materiales educativos del aplicativo?, ¿Es efectivo en el envío y recepción del enlace de las plataformas virtuales por medio del WhatsApp?, ¿Mejora su calificación por la disponibilidad de materiales educativos por el uso por mes?, ¿Considera útil la herramienta para las evaluaciones en cada módulo? y ¿Mejora el aprendizaje al usar WhatsApp como una herramienta interactiva e indispensable por mes?. Obtenidos los datos se procesaron mediante estadísticas básicas y correlación. Los resultados determinaron que el momento que revisa el aplicativo fue 35 % revisa 4 a 7 veces al día, eficiencia en el envío y recepción de materiales 80 %, eficiencia en envío y recepción de enlaces con 75 %, mejora las calificaciones al usar WhatsApp con 45 % mejoraron calificación de 15, Considera útil para las evaluaciones con 90 % considera útil, mejora el aprendizaje su uso con 85 % y correlación entre considera útil el WhatsApp y mejora del aprendizaje con $r = 0.973$. Concluye que, existe alta correlación entre considera útil el WhatsApp y mejora del aprendizaje, lo que significa que el uso de esta herramienta influye en la mejora del aprendizaje. Sin embargo, es necesario tener en cuenta que utilice con fines académicos.

Palabras clave: WhatsApp, eficiencia, aprendizaje, fuente almacenamiento y comunicación.

Abstract

Technological progress has transcended communication, immediacy, sending audiovisual and written materials, interaction and interactivity anywhere in the world. Reason, that the efficiency of WhatsApp for learning in higher education was investigated. The objective was to determine if there is a correlation between the usefulness of the application and the improvement of learning. The methodology is based on descriptive, the representative sample was 20 students; For this reason, the questionnaires were elaborated. How often do you review the messages of this application during the day? Is the reception and storage of educational materials of the application efficient? Is it effective in sending and receiving the link of the virtual platforms through WhatsApp? Does your rating improve due to the availability of educational materials for use per month? Do you consider the tool useful for evaluations in each module? and Does it improve learning by using WhatsApp as an interactive and indispensable tool per month? Once the data was obtained, it was processed using basic statistics and correlation. The results determined that the moment the application is reviewed was 35%, reviews 4 to 7 times a day, efficiency in sending and receiving materials 80%, efficiency in sending and receiving links with 75%, improves qualifications when using WhatsApp with 45% improved a rating of 15, considers it useful for evaluations with 90% considers it useful, improves learning its use with 85% and correlation between considers WhatsApp useful and improvement of learning with $r = 0.973$. It concludes that there is a high correlation between considering WhatsApp useful and learning improvement, which means that the use of this tool influences the improvement of learning, however it is necessary to take into account that it is used for academic purposes.

Keywords: WhatsApp, efficiency, learning, source storage and communication.

I. Introduction

Technological progress has transcended in communication, in immediacy, in sending audiovisual and written materials, in interaction and interactivity anywhere in the world, which unites and communicates in real time and efficiently. Therefore, these technological characteristics have influenced solving the problem in different aspects, efficiently and safely, which improves the quality of life. According to Pérez (2020) he mentions that technology has helped to adapt in an environment that is currently required and that this technological development has helped to overcome communication barriers, reduce gaps anywhere, as a result there has been an improvement in the rate of life. Likewise, Flores-Vivar and García-Peñalvo (2023) mention that the advance of emerging technologies may be on the way to transform teaching and learning, which led to a disruption in education as we know it today.

This technological innovation focuses on the evolution of electronic devices such as the smartphone, desktop computer and tablet that, in its content of computer programs known as applications or virtual tools, serve for continuous communication that shortens the gaps of place and time, improvement in solving tasks whether at work, study and other matters of communication, distraction and in different aspects. According to Mildre (2022) mentions that mobile applications have revolutionized daily activities such as saving time and efficiency to carry out tasks, this computer tool can also be used in work, distraction and studies.

Nowadays, there are many applications but it is necessary to highlight WhatsApp, which is a technological tool that is downloaded for free on electronic and mobile devices, which has the functions to solve daily problems, whether it is for communication, sending documents, images, audio and videos in real time and immediately. It is also a means that serves to organize and schedule schedules in this case through audio or videoconference calls. Therefore, these technological characteristics of this virtual tool are also useful for specific university students in the storage of academic files and access at all times to reinforce learning. This statement is corroborated by Ramón (2022), who mentions the rapid growth of the population in the use of

mobile applications, has boosted the demand for computer systems that allow solving all kinds of emerging needs of the economically active population. Also with Barquero (2016), he exposes that the consumption habits of communication media are changing the multi-screen phenomena; that is, using mobile devices simultaneously with television to search for program content, what you want to see or to communicate with other people through social networks or WhatsApp.

It should be noted that WhatsApp is used by all users who use electronic devices such as Smartphones, desktop computers, and Tablets, which has been of the utmost importance at the beginning of the pandemic and today has established itself as a means of communication and delivery of materials in this case to university students that can benefit them in solving their academic problems in each course, as it is useful and beneficial for learning, as long as it is used for these purposes. This analysis is corroborated by Ramírez et. to the. (2022) who concluded their research on the use of this mobile application in postgraduate studies, showed high satisfaction with the use of WhatsApp, as a virtual medium for the development of distance education. The criteria obtained will contribute to its continuous improvement. It is an application that can be used as a didactic tool. Also Mamani Sánchez, H. (2019) concludes that WhatsApp is recurrent in the students of the School of Communication Sciences of the National University of San Agustín to communicate with their teachers, since it is appreciated that 87% use it and of the students from first to fifth, 82%.

For this reason, research was carried out on the efficiency of the tool, as a technological tool for learning in higher education. The objective was to determine if there is a correlation between the utility of the application and the improvement of learning. It is also necessary to mention that the purpose of this research is to highlight this software that, due to its functional characteristics, can influence the learning of university students.

II. Materials and Methods

Type of investigation

The research is based on the descriptive, non-experimental method; It was evaluated and quantified using questionnaire instruments about the moments that WhatsApp uses, the efficiency of the use of this technological tool and the improvement of the learning of university students when using it. The data was collected weekly and monthly within the schedule. The research was cross-sectional; since it was done only once and applied the mixed method for interpretation and analysis.

Population and sample

It is referred as a source of study to the 200 students on average enrolled in the professional school of accounting. Regarding the sample, 10% of the total population of the accounting school was taken, which in this case was equal to a scheduled course in a classroom, this served as a representative basis for evaluations on communication through WhatsApp, agree for the jobs and send a link for the classes.

Data Collection Techniques

For data collection, survey techniques and questionnaire instruments were applied, formulated on moments that WhatsApp reviews, efficiency of this application, improves learning (These questions are detailed in procedures).

Statistical analysis

Obtained the data from the questionnaires by week and month, they were processed using basic statistics and tables and figures were prepared for their interpretation and analysis. The

regression that determined the relationship between the utility of WhatsApp for the evaluations in the improvement of learning was also carried out.

Procedures

The evaluations were carried out as follows:

- 20 students were taken as a representative sample of the Professional School of Accounting who were evaluated on the use of WhatsApp.
- The efficiency of the application in learning in learning was evaluated 4 times a month from May to August 2022, for which survey techniques and instruments for the collection were used, such as questionnaires on How often do you review the messages of WhatsApp during the day? Is it efficient in receiving and storing educational materials when using the tool? Is it effective in sending and receiving the link of the virtual platforms through WhatsApp?
- Regarding the evaluation of learning in relation to the use of WhatsApp, they were questioned per month; that is, by module on, does your qualification improve due to the availability of educational materials due to the use of WhatsApp per month? Do you consider WhatsApp useful for the evaluations in each module? And does it improve learning by using WhatsApp as an interactive and indispensable tool per month?
- Obtained the data from the surveys, they were processed through basic statistics and tables were prepared for their interpretation and analysis.
- Finally, the correlation was made between what WhatsApp is considered useful for the evaluations of each module and learning improvement in order to know the influence of this technological tool, for which regression statistics were applied.

III. Results

Moment checking WhatsApp

Regarding the moment, they check WhatsApp, which is detailed in Table 1, it is indicated that 35% of the students check 4 to 7 times a day. Therefore, it is interpreted that most students review this virtual tool every moment to keep an eye on classes, jobs, messages on topics to be discussed, homework and others, which improves learning and especially on school days. exams. Therefore, it is analyzed that the use of this technological tool is a means of transferring and obtaining information in real time, stores information, provides materials (books, slides, etc.) and audiovisual messages, which is available for training. of academic subjects and reinforces teaching. This analysis is supported by Moreira and Días (2018) who conclude that the use of WhatsApp based on principles of constructivism, autonomy, flexibility, inclusion and interactivity can have a positive effect on the academics of higher level students in motivation, confidence competitiveness and peer relationships. Which improves learning. Likewise, Pessoa et. to the. (2016) conclude that the application proves to be of great help as a study tool and in aid of decision making.

Table 1. Check whatsapp per day during the academic year

	Less than 4	4 to 7	7 to 10	10 to more	No opinion	Total (%)
Check	20	35	30	15	0	100

Efficiency in sending and receiving academic materials

Regarding the efficiency of WhatsApp in sending academic materials, which is detailed in Table 2, it is indicated that 80% of students prefer this virtual tool for sending and storing educational materials. This result means that the majority of students prefer this platform for sending and receiving documents, videos and slides, other learning materials, which makes it useful to use whenever it is required. Therefore, it is analyzed that the interaction and interactivity through this platform reinforces what is taught in the classroom, which makes it easier to answer the exams.

Exposed, this analysis is supported by Veytia and Bastidas (2021), who highlight the utility of WhatsApp, which is necessary and useful for organizing work, developing efficient communication between university students, and between students and teachers, which strengthens interpersonal relationships, as long as you work with small groups and implement specific didactic activities.

Table 2. Efficiency in sending and receiving educational materials

	Efficient	Not efficient	No opinion	Total (%)
Shipping and storage	80	15	5	100

Efficiency in sending and receiving the link of the platforms

Concerning the sending of the link of the videoconference platforms that is exposed in table 3, it can be seen that 75% of the students answered that it is efficient to agree and link to the classes in real time. This result means that the majority of students agree to use this technological tool that directly links to platforms such as Google meet, Zoom, and Microsoft Teams, which is more common. Therefore, the use of WhatsApp as a means to send and receive links is analyzed, it is vital for immediate access to virtual classes wherever the student is. This analysis is based on Guadamuz-Villalobos (2020) who concludes that sending attachments and links of interest, the possibility of sharing images or screenshots, and audio recordings to share assertive explanations constitute a range of highly useful options. Useful for exchanging ideas about courses taught, learning materials, and related resources.

Table 3. Efficiency in sending links from video conferencing platforms

	Efficient	Not efficient	No opinion	Total (%)
Shipment	75	15	10	100

Improve ratings when using WhatsApp

Regarding the qualification of the students per month indicated in Table 4, it is detailed that in July and August, it was obtained that 45% of the students who improved the qualification from 15 to 16 in each module. Therefore, it is interpreted that almost 50% of the students improved their qualification with the use of this technological tool when studying the stored files. Therefore, it is analyzed that WhatsApp is a means of communication or an important platform for the efficiency of capturing the topics covered in class, raising ideas and others, either by the provision of stored files such as videos, audios, books, documents, slides and images, which influence the grade. This statement is based on Carbajal-Reyes et. to the. (2020) who conclude that the millennial generation has to take into account the use of this technology in academic training, when handling communication applications. Since the semester from January to July 2019, those who felt motivated contributed to the class with shares, they felt in their technological core when using WhatsApp, unlike the conventional ones, that there were no significant changes in academics.

Table 4. Improve ratings when using WhatsApp

Qualification	May	June	July	August
10 to 12	35	40	45	45
12 to 14	30	25	30	35
14 to 16	20	25	20	15
16 to 18	15	10	5	5
18 to 20	0	0	0	0
Total	100	100	100	100

Consider WhatsApp useful for evaluations

Regarding the usefulness of WhatsApp for the evaluations carried out per month, which is observed in Table 5, it can be seen that in July, 90% of the students mentioned that it is useful for learning. Therefore, it means that most of the students were served by the application of this technological tool, either by its availability, exchange of academic files, storage and continuous interaction with their classmates and teacher. It was analyzed that the use of WhatsApp due to its technological characteristics in which it has materials and means of communication improves learning, creativity and in a pandemic it is considered useful. Exposed, this analysis is supported by Guíñez-Cabrera and Mansilla-Obando (2022) who conclude, the study showed that WhatsApp Web is useful for academic purposes and in the context of a pandemic, it is beneficial; since the results revealed that the performance expectation (utility) of the platform was the most outstanding category, which facilitates the acceptance of WhatsApp Web in educational activities. Likewise, Suárez B. (2018) concludes that most of the works highlight the positive attitude of students towards the educational use of WhatsApp and encourages its incorporation as a support tool in the teaching-learning process.

Table 5. Percentage that considers WhatsApp useful for evaluations by month

	May	June	July	August
It is useful	75	85	90	85
It is not useful	25	15	10	15
Total	100	100	100	100

Improve learning when using WhatsApp

In the statistical analysis of the improvement in learning to use the tool detailed in Table 6, June stands out with 85% of the students who state that this application improves learning. Therefore, this result shows that most of the students learn topics that they could not capture in face-to-face classes and that at the end of the semesters are essential. Therefore, it is analyzed that this technological tool has an effect on improving learning but as long as the student takes advantage of the stored academic materials, be it books, slides, images or other files, also in the exchange of ideas and reports with their peers. and teacher. Mentioned this analysis is supported by Trejos Buriticá (2018), who mentions that it is worthwhile for university professors to enter the world of young people and take advantage of the services they use the most to maintain academic and informal communication with them; the use of the application improves the learning of computer programming in Systems Engineering.

Table 6. Percentage of improvement in learning when using WhatsApp

	May	June	July	August
Gets better	75	80	85	80
Does not gets better	15	10	15	10
No opinion	10	5	0	10
Total	100	95	100	100

Correlation between considering WhatsApp useful and learning improvement

As for the correlation between considering WhatsApp useful and learning improvement indicated in Figure 1, it was determined that 90% of the students improved their learning up to 85%. Therefore, it is interpreted that almost the majority of those who use the virtual tool is directly related to improving the learning of the courses. Therefore, this result analyzes that the use of WhatsApp is considered useful for improving learning; since the availability of academic materials such as books, slides, images, audio, videos and as a means of interacting with classmates and the teacher is efficient. This result is also evidenced by the correlation coefficient $r = 0.973$, which

means that the trend is positive because using WhatsApp improves learning. These values are specified by Laguna (2014) who considers that a correlation is low below 0.30 in absolute value, that there is a moderate association between 0.30 and 0.70, and a high one above 0.70.

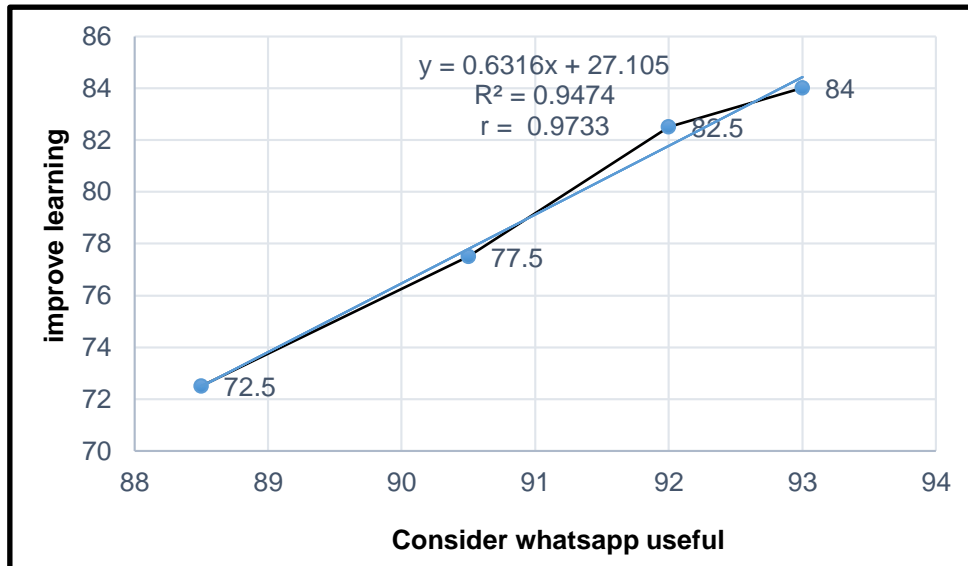


Figure 1. Percentage of people who consider WhatsApp useful for improving learning



Figure 2. Learning through whatsapp

IV. Conclusions

It was determined that there is a high correlation between considering the application useful and learning improvement, which obtained $r = 0.973$, which indicates that the use of WhatsApp influences learning; however, it is necessary to take into account that this tool is used for academic purposes, that is, to reinforce learning through the use of the materials that are available in its storage. Therefore, the use of this application improves learning; however, it is necessary for students to collect the ordered information for each class.

It was also determined that the use of the application is necessary for the university student, since it serves as a means to interact with their other classmates, teacher, schedule class hours, send and receive homework link and virtual class. In addition to a source of files to reinforce learning and prepare reports. Therefore, the use of this computer program benefits the student.

Finally, it is concluded that when using WhatsApp, the students improved their qualification, which was noted in the evaluations per month or module; Since this period the students needed to search for information on the classes dealt with in the classroom or virtual and the stored files served as a source of reports to reinforce learning.

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