

## Implementation of technology in accounting courses: What do students and professors think?

## Implantación de la tecnología a los cursos de Contabilidad: ¿Qué opinan los estudiantes y profesores?

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### Abstract

The main objectives of this research were to describe the technological alternatives that can be incorporated in the teaching process ; identify advantages and disadvantages of using technology in Accounting courses; determine whether there is a strategy for the effective implementation of technological alternatives in accounting courses ; and study the views of students and teachers The methodology consisted of a review of recent articles published in refereed journals . A field study where students and teachers participated was also performed. It was found that the alternative technologies that can be used in the educational process are : educational platforms , visual resources as " power point " and projections, audiovisual resources as " podcast " and " videocast " , laptops , tablets and phones. They have the advantage of time flexibility , accessibility , and effective cost.

**Technology alternatives, Accounting, Students**

### Resumen

Los principales objetivos de esta investigación fueron describir las alternativas tecnológicas que pueden ser incorporadas en el proceso de enseñanza; identificar ventajas y desventajas del uso de la tecnología en los cursos de Contabilidad ; determinar si existe una estrategia para la implementación efectiva de alternativas tecnológicas en los cursos de Contabilidad ; y estudiar las opiniones de estudiantes y profesores La metodología consistió en una revisión de artículos recientes publicados en revistas arbitradas . También se realizó un estudio de campo en el que participaron estudiantes y profesores. Se encontró que las tecnologías alternativas que se pueden utilizar en el proceso educativo son: plataformas educativas, recursos visuales como "power point" y proyecciones, recursos audiovisuales como "podcast" y "videocast", ordenadores portátiles, tabletas y teléfonos. Tienen la ventaja de la flexibilidad horaria, la accesibilidad y el coste efectivo.

**Alternativas tecnológicas, Contabilidad, Estudiantes**

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## Introduction

Education is the basis for the development of every professional. Given the constant demand for complete accountants who have the necessary preparation for the working world and its challenges, it is important to highlight the need for technology because the current reality of companies is that they use technology as the main tool to carry out accounting.

Therefore, it is important to direct students to learn and develop skills that incorporate technology into their academic preparation. This will result in students who are better prepared for the profession and to face the demands of the working world.

The following study consists of describing the scope of education and technology in today's world. How do they complement each other to meet the demand for competitive professionals in accounting? What alternatives does technology offer to education to create students capable of excelling in the world of work with their skills? What are the advantages and disadvantages of these alternatives, if used in education? What do students and teachers think about it?

To answer these questions, the following objectives were established: to describe the technological alternatives that can be incorporated into the teaching process; to identify advantages and disadvantages of the use of technology in accounting courses; to determine if there is a strategy for the effective implementation of technological alternatives in accounting courses; and to know the perception of students and professors on the use of technology.

In such a way that problems that may arise can be anticipated and modified in time, thus contributing to the incorporation of technology in the teaching process that benefits students in their academic growth.

The methodology used to carry out this research consists of a literature review of articles published in peer-reviewed journals that include studies on different electronic devices used in education.

Similarly, a field study was conducted where two questionnaires were submitted to accounting students and professors of my university campus of origin to know their opinion on the use of technology in accounting courses. In order to determine a viable option for integrating education and technology into the teaching-learning process that would result in a greater benefit for students and professors.

## Literature Review

Richardson P., Dellaportas, Perera & Richardson B. discuss how the college student's approach to their academic development is based on their learning style. (2013) Some models that can be found in the literature are: Kolb "s experimental model, Ramsden's model, and the most common model, the VARK model. Kolb "s experiential model is based on a learning cycle that connects four components: abstract conceptualism, concrete experience, active observation, and active experimentation.

Ramsden's model based on a depth versus surface approach to learning, two approaches separated by depth of understanding and conceptions learned. The VARK model is based on the modes of receiving, interpreting and disseminating information, visually, aurally, written and spoken. It attempts to interpret how information is absorbed and the implications it has on the pairing of teaching methods with learning methods. According to research conducted by the Semel Institute for Neuroscience and Human Behavior at the University of Los Angeles California, "stimulations of various types actually change brain structures and affect the way people think" (Hicks, 2011, p.189).

E-learning and m-learning systems facilitate such stimulations to extend academic training. A pedagogical justification for these systems mentioned in the literature is the diffusion of innovations theory, which proposes five conditions for innovation adoption which are relative advantages, compatibility, complexity, trialability, and observability (Nedungadi & Raman, 2012; Annan-Coultas, 2012). Since the learning style leads the learner to a greater or lesser absorption of material depending on the individual's preferred structure for learning. Depending on the preference, it is the approach to be given to learning and the method to be applied.

"E-learning refers to innovations in education where educational materials are distributed using some type of electronic network-based virtual learning space" (Richardson, Dellaportas, Perera & Richardson, 2013, p.6).

The same aims to provide a type of learning equivalent or better than the traditional one (Richardson, Dellaportas, Perera & Richardson, 2013, p.6) in a given space, the computer. Promoting continuous student participation in the academic environment based on electronic learning better known as "e-learning".

"M-learning consists of portable wireless technology. It deals with fast access to information from artifacts with the ability to store large amounts of multimedia resources (Richardson, Dellaportas, Perera & Richardson, 2013).

Among the devices are smart phones, mp3 players, iPods, tablets and laptops. It is considered to be a possible complement to e-learning as e-learning is more versatile for use anywhere and anytime as long as you have access to the internet. "The justification for "m-learning" is often to increase access and enable new pedagogical methods" (Nedungadi & Raman, 2012, p.660).

"The transition from "e-learning" to "m-learning" has resulted in a change in terminology. For example, 'distance education' has been replaced by 'situated education'" (Nedungadi & Raman, 2012, p.661). Implying that the combination of the two can help the student in distance learning and in the classroom.

With the diversity of devices that can be used for information access, "e-learning" can be supplemented with "m-learning" (Nedungadi & Raman, 2012). Serving as a benefit for teachers when delivering their material to students inside and outside the school environment. Helping the student to develop technological knowledge necessary for the work environment.

Over time it has been proven that technology is an essential part of daily tasks such as learning, work and entertainment. "Along with the rest of the world, the accounting profession is dependent on technology" (Vance, Carlson, Lively & Mastracchio, 2013, p. 13). It is increasingly in demand.

However, not everyone has incorporated this tool in the same way. On the one hand, there are different alternatives for applying the same technology and, on the other hand, there is the possibility that it may not be applied at all for fear of change and its consequences. However, we must not forget that a need for innovation has arisen.

"All large, medium and small competitive CPA firms are striving for a paperless environment, where every employee works on computers using software, electronic storage and the Internet" (Vance, Carlson, Lively & Mastracchio, 2013, p. 13).

One of the reasons why aspiring professionals should consider being trained in the use of technology. The learning curve in technology, according to one study, increases every 18 months, which means that knowledge must be kept up to date, since the increase in the use of technology proves to continue to increase over time (Hicks, 2011, p.188).

The idea of improving the courses offered in universities with new technology is becoming more likely, due to the need to be at the forefront of the working world. It is for this reason that universities are beginning to look to the future and its trends to provide students with the best tools for greater competitiveness.

As a result, they must make decisions based on concise information that will provide them with the best option for their students' progress as future professionals. Because it affects educators, learners and the university, several alternatives that provide a better return for all must be evaluated.

Among the technological alternatives available for the educational process is access to educational platforms, based on accounting courses. These can be accessed by students remotely with the intention of reinforcing what they have learned in class. The platforms have instruments that evaluate the constant progress of the students and provide them with the opportunity to develop a study habit.

The purpose is to develop problem solving skills and fast execution. For which provides tools such as consultation to the material, the teacher and forums that allow discussion of problems presented.

Another alternative is one that is generally observed more frequently in current education, the use of projections such as "power points". This tool allows the presentation of educational material by means of ideas, concepts and images in a dynamic and attractive way. This provides a theoretical framework for students in their teaching. Encouraging the student's critical analysis and expanding the development of ideas.

On the other hand, the integration of audiovisual resources is a technological alternative that can be expanded in the teaching process. As well as an alternative called "podcast", for that auditory student, who requires course recordings, the same can be customized by the one who creates them. "It allows the user to download files through an Internet connection to a program that manages them" (Richardson, Dellaportas, Perera & Richardson, 2013, p.8). With the purpose of having them accessible at all times without having to initiate a search. It is the method to have the presentations of the courses available audibly.

There is also the alternative called "videocast" or "vodcast", an option for the visual learner. It facilitates access to videos that can be downloaded easily and free of charge (Pagán, 2011). "Videos can present similar experiences that all students can discuss" (Robinson & Stubberrud, 2012, p.102). Supporting theoretical and practical classroom material.

One instrument that incorporates many technological elements is the laptop. It has a wide variety of programs for daily academic use. It has functions for taking notes, accessing course files in the learning management system, searching for course concepts, communicating via e-mail with professors and students, doing homework and group work, among others (Annan-Coultas, 2012).

It provides the flexibility to move with all available technology to encompass all educational material given inside and outside the classroom. Expanding knowledge beyond the book and the classroom.

A lightweight, portable alternative is known as a tablet. "Although electronic tablets offer the user a variety of functions other than reading books, the technology appears to be widely adopted in the classroom" (Martinez-Estrada & Conaway, 2012, p.125).

This has the ability to be used as an "ebook reader" in order to have the texts of the class digitally and not printed. Similarly, the tablet gives you the option of accessing the Internet to use educational platforms, send and receive emails, access RSS (Really Simple Syndication) subscriptions, a tool to receive updated information from portals quickly (Pagán, 2011), among others. Many of these devices have the capacity to create and read files like a laptop.

The cell phone can have the educational application. It is an ideal device to keep updated with the courses. It has applications to record voices and short videos, write messages, take pictures, use tools such as the calculator, access the electronic network, and download programs for any need that may arise, such as the use of a dictionary. Being the most common communication device at the moment, makes it an easy to use one, which allows the implementation of smartphones to mobile education.

Each alternative can benefit the student and the teacher in the teaching-learning process. However, it is up to both parties the performance that they can provide. This is because they have advantages and disadvantages that may or may not be overcome. In order to achieve a good match of technological alternatives to accounting courses, it is necessary to highlight them. Beginning with a summary of what has been found in the literature, the advantages and disadvantages vary from viewer to viewer. What for some represents a benefit, for others is a limitation. One example is the cost of integrating technology into education. Although, "The cost of technology and its acquisition is reducing significantly" (Richardson, Dellaportas, Perera & Richardson, 2013, p.7).

A technological integration represents a large investment of money, however, in the long term the investment would be recovered; turning it into a technological advantage that involves the effective cost.

Due to their multiple uses, mobile devices are a distraction factor which is a disadvantage. However, they can also represent an increase in the motivation to study, since they facilitate access to all types of material at the time the user determines it convenient.

"Academic success in an online environment appears to depend on appropriate motivation and attitudes toward technology..." (Richardson, Dellaportas, Perera & Richardson, 2013, p.7). These devices can help increase or decrease students' academic performance, depending on the type of use they are put to.

The user faces the risk of becoming dependent on technology. This is because technology provides them with a wide flexibility, through access to all its possible uses at any place and at any time. For example, when starting the process of self-learning, looking for the solution of problems on the Internet or consulting with peers on the network for them to give the solution causes the student to stop doing the exercise or problem on their own and then verify it. This is a disadvantage because it deprives the student of the opportunity to develop critical thinking.

Although not everyone shares the same opinion, they argue that interaction is reduced because attention is directed to the digital world and not to the traditional person-to-person world.

"Integrating technology into the classroom allows teachers the benefit of connecting with students digitally by providing rich learning experiences that students can relate to" (Hicks, 2011, p.189). Which in turn increases student interaction because it engages the student's attention in a developmentally stimulating way making them more receptive.

Some disadvantages shown in a study on the use of technology, particularly the laptop, are related to technical problems (Annn-Coutlas, 2012). These include loss of connectivity during educational work and exams, difficulty in downloading documents, problems with program compatibility and program management, among others. Users are not trained for all mishaps resulting from the functionality of technology and its manipulation.

The student's preference for a higher level of learning lies in the expansion of methods to deliver information. The use of technological devices serves this purpose by promoting a high level of absorption of academic material.

### **Methodology**

This research is based on a descriptive non-experimental design. The population of participants for this study is composed of accounting students and professors at my university campus.

There are a total of 353 students pursuing their baccalaureate degree with a major concentration in accounting and nine (9) professors teaching accounting courses. A sample of 122 students and five (5) professors was selected.

The sample of students equals 35% of the population and the sample of professors equals 56%. Both samples were selected informally and at convenience. A questionnaire was administered to them personally to know their opinion about the use of technology in accounting courses.

The measurement instrument used to collect the information necessary to fulfill the purpose of this research was the questionnaire. The questionnaire presents questions aimed at knowing the perception of students and professors about the use of technology in accounting courses.

Students were given a questionnaire containing five closed questions, five hybrid questions and one open question. These questions were directed to the student's profile; the frequency and importance for the student of the use of technology; the opinion on the implementation and disposition to technological alternatives; the advantages and disadvantages they have experienced in the use of technological alternatives; to know the strategies and possibilities for the integration and implementation of technology in teaching; and the determination of the courses the student has taken that give them the basis for expressing their opinion.

Similarly, a questionnaire was administered to teachers with three closed questions, eight hybrid questions and two open questions.

These are focused on establishing a profile of the professor; their willingness to contribute to the implementation of technology in accounting courses; the importance and frequency they give to the use of technology in teaching; the technological alternatives allowed and encouraged by them; the advantages and disadvantages they have experienced in the use of technology; the strategies they suggest for the use of technology; the strategies they suggest for the implementation of technology in accounting courses; the importance and frequency they give to the use of technology in teaching; the strategies they suggest for the implementation of technology in accounting courses; and the advantages and disadvantages they have experienced in the use of technology; the strategies they suggest for an effective implementation of technology in the teaching-learning process in accounting courses; determine the accounting courses they teach and the technological alternatives they can suggest in addition to the existing ones to arrive at a good strategy.

## Results

The data collected in the field study are based on a questionnaire to accounting students with a sample of 122 students (see appendix, graph I, p. 19). Of these, 30.33% are in their fifth year and above, 34.43% in their fourth year, 25.40% in their third year, and 9.84% in their second year.

Among the questions asked of the students, they were asked to write down which accounting courses they had taken in order to know on which courses they based their answers to the other questions. 100% of the participants had taken at least the basic course.

Most had taken Intermediate Accounting I (84.43%) and II (68.85%) and Cost Accounting (59.84%). Some had taken other courses (see appendix, graph X, p. 20).

Based on their experience in the accounting courses taken, it was determined how frequently they use technology for the learning process. 45.08% indicated almost always, 27.05% always, 27.05% almost never and .82% never (see appendix, graph II, p. 19).

The students were asked how important the use of technology is for the teaching-learning process in accounting courses. Some 53.28% responded that they consider it important, 40.16% consider it very important and for 6.56% it is not very important (see appendix, graph III, p. 19).

Students were asked to identify the technological alternatives they use the most in the learning process of the accounting course. The three alternatives that obtained the highest frequency were: visual resources such as "power point" and projections with 85.25%, laptops with 75.41% and tablets with 53.28%, in the option of others the computer was mentioned (see appendix, graph VII, page 20).

They were also asked to identify the advantages and disadvantages they attribute to these alternatives. Among the main advantages were the following: accessibility to the material 88.52%, time flexibility 69.67% and portability 67.21%. Similarly, the most frequently mentioned disadvantages by students were: the distraction factor (82.79%), technical problems (74.59%) and technological dependence (63.93%). The students identified as a disadvantage that not all the material is in the visual resources used and the lack of feedback (see appendix, graph XI, p. 20).

Students were asked if they find it necessary to implement the use of technology in the teaching of accounting courses. 95.08% answered that technology should be implemented in the teaching process and 4.92% that it should not (see appendix, graph IV, page 19). The technological alternatives that they indicated as their preferred in the teaching-learning process were: visual resources such as "power point" and projections (72.35%), laptops (70.49%), tablets (63.11%), educational platforms (57.38%), audio visual resources "podcast" and "videocast" (30.33%), cell phones (27.05%), in the option of others, programs used in the work environment were mentioned (see appendix, graph IX, page 20).

After identifying the alternatives to be implemented in the accounting courses, it was determined and identified if there is a strategy for the teaching process that integrates technology effectively.

50.00% answered no, 48.36% answered yes and 1.64% did not answer. Among the most outstanding strategies were: creating and optimizing laboratories for accounting courses; providing tools for students to become familiar with accounting technology programs; and finally, motivating students to use technological resources (see appendix, graph VI, p. 19).

In addition to asking about the existence of a strategy to implement the technology, we sought to know if the student would contribute to the implementation process. A total of 78.69% answered that they are willing to contribute to the implementation process, 19.67% that they are not, and 1.64% did not answer (see appendix, graph V, p. 19).

Meanwhile, 94.26% of the students think that technology will be integrated into accounting courses in a more intense way than it is currently used, while 5.74% said it will not. Among the comments on this last question "Technology equals progress, denying it is backward" (see appendix, graph VIII, p. 20).

The following findings are based on a questionnaire to accounting professors on my campus. A sample of five (5) professors was selected from a total of nine (9) professors who teach accounting courses (see appendix, graph XII, p.21).

A questionnaire was administered to them with the purpose of knowing their perception on the use of technology in the teaching-learning process of accounting courses.

The participating professors occupy the following positions in the Institution: 40% are instructors, 40% are associate professors and 20% are full professors.

In order to find out which accounting courses the professors based their answers to the following questions, they were asked to indicate the courses they offered. These included Basic Accounting I, Basic Accounting II, Intermediate Accounting I, Intermediate Accounting II, and Managerial Accounting, other courses (see appendix, graph XXII, p. 22).

The professors were asked to indicate how important the use of technology is for the teaching-learning process in accounting courses. Eighty percent considered it very important and 20% considered it important (see appendix, graph XIII, p.21).

The frequency of its use for the teaching-learning process was mostly always (80%) and never (20%) (see appendix, graph XIV, p.21).

After asking about the importance and frequency of the use of technology in the teaching-learning process, we sought to identify the technological alternatives that teachers use or allow their students to use in the classroom.

These were: visual resources such as "power point" and projections (100%), laptops (100%), tablets (60%), educational platforms (60%), cell phones (40%) and audiovisual resources such as "podcast" and "videocast" (20%) (see appendix, graph XX, page 22).

Of the technological alternatives they use or allow to be used in the classroom, teachers use or encourage the use outside the classroom for the teaching-learning process of the accounting course the following: laptops (80%), tablets (60%), educational platforms (60%), visual resources such as "power point" and projections (60%), cell phones (20%) and audiovisual resources such as "podcast" and "videocast" (20%) (see appendix, graph XXIII, p. 23).

We sought to know what advantages and disadvantages teachers experience when making use of the technological alternatives identified. The most important advantages were: time flexibility (80%), material accessibility (60%) and cost-effectiveness (60%). On the other hand, the disadvantages highlighted are: technical problems (100%), distraction factor (80%) and technological dependence (60%) (see appendix, graph XXI, p.22).

The professors were asked for their opinion about the implementation of technology in accounting courses. Sixty percent felt that it should be implemented in all courses while the remaining 40% felt that it should be implemented in only some courses. One comment on this question was "Some technology, not 100% of the course" (see appendix, graph XV, page 21).

After identifying technological alternatives to be implemented in the accounting courses, the professors were asked to mention others in addition to the existing ones. To which the professors answered: "Peachtree to all classrooms offering accounting courses"; "Educational platforms related to accounting (e.g. Contributions)"; "Electronic platforms in accounting courses; Video conferences"; "Videos prepared with the topics discussed"; "Blackboard (platform), Collaborate". In addition to suggesting alternatives, they were asked if they would implement technology in accounting courses if they had the opportunity, to which 80% answered yes and 20% did not answer (see appendix, graph XVI, page 21).

In an attempt to find out possible strategies for implementing the use of technology effectively, 60% of the professors answered and mentioned: "Cost and effectiveness analysis must be done"; "Offering computer courses as requirements for accounting courses"; "Those aimed at making sure that the student is grasping the information and material presented"; "Discussion of the material using technology, not to shorten the time but to complement the discussion with students".

The remaining 40% did not answer the question (see Appendix, Figure XVII, p.21). In addition, they were asked if they would be willing to contribute to the learning process, 80% responded that they would contribute, while the remaining 20% responded no (see appendix, graph XVIII, p.22).

Finally, an attempt was made to perceive the professor's opinion on the implementation of other technological alternatives to accounting courses, 80% responded that they do see it being achieved in the near future and 20% do not see it being implemented in the near future (see appendix, graph XIX, p.22).

In general terms, students make use of most of the technological alternatives and show support for their implementation in accounting courses. They identify greater advantages in using them and understand that technology equals progress and refusing to use it is a step backward.

They see in the near future that the use of technology will be effectively achieved with the purpose of providing support to the academic environment.

The professors, in spite of showing support for the implementation of technology in the courses, show some resistance, expressing that if it is implemented it should be "Some technology, not 100% of the course", to which others chose not to answer.

They emphasize more the disadvantages when using technological alternatives and understand that students sometimes prefer the development of problem solving on the blackboard at the time of taking the class. Nevertheless, they see that in the future technology will be implemented in accounting courses.

### **Conclusion and recommendations**

The technological alternatives that can be incorporated into Accounting courses are based on a combination of "blended learning" where each alternative can be used inside and outside the classroom to complement the traditional method of education.

These alternatives are: Educational platforms, Visual resources such as "power point" and projections, Audiovisual resources such as "podcast" and "videocast", laptops, tablets and cell phones. The field study reflected that the preferred by students were Educational Platforms, Visual Resources such as "power point" and projections and laptops. Teachers use and support the use of these and showed particular support for the use of laptops for accounting courses.

The advantages derived from the use of technological alternatives include greater accessibility to accounting course material, the opportunity to make portable all resources related to the material given in class, and better time flexibility.



The disadvantages identified when making use of technological alternatives are the distraction factor, technological dependence and technical problems; which are inevitable but can be overcome. These are aspects to be considered in the implementation of technology in accounting courses.

When we talk about the integration of technological alternatives to accounting courses, we want to determine if there are strategies for an effective implementation. To learn about this particular aspect, an approach was made to the perception and position of students and professors.

This led to the conclusion that for this to happen, it is necessary to orient, train, motivate and reinforce students, professors and universities on the implementation of technology in accounting courses. Starting by establishing a plan to create, enable and optimize the universities with the intention of directing them towards the future.

Students and professors are of the opinion that the implementation of technological alternatives will be achieved in the near future. This could be related to the fact that the great majority considers that technology for the teaching-learning process is important and the frequency of its use is almost always. This leads them to be willing to contribute to this vital process of implementing technology in accounting courses.

Given the results found in this study, it is recommended to investigate and create a plan to follow for the implementation of technological alternatives to Accounting courses in order to achieve the desired result of being at the forefront in the working world of Accounting.

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