

Software as a Service Google Apps in the Internal Communication of the National University of San Antonio Abad del Cusco

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Abstract

The internal communication in public universities is an unexplored field, however the previous investigations considered to internal communication as a strategic element and essential to the success of an organization. You can improve internal communication using digital channels that enhance and simplify the variety of traditional channels. The objective of the research is determined what extent applications in the cloud of Google Apps for Education improve internal communication between members of the university community. The results of the research reveal that the use of the Software as a Service Google Apps does not substantially improve internal communication among members of the university community. However, we have identified some factors that prevent the use of Google Apps for Education, such as limitations in computer infrastructure, low level of knowledge in computing, limited use of digital tools in academic activities and the absence of a strategic plan for internal communication.

Keywords

Internal Communication, Software as a Service, Google Apps for Education, Cloud Computing, Higher Education.

1. Introduction

The present scientific research studies the use of Cloud Computing applications to improve internal communication in Higher University Education. Google Apps for Education is a communication and collaboration platform, an example of Software as a Service or Cloud Computing application. The National University of San Antonio Abad of the Cusco had the need to implement an Institutional Electronic Mail System for the whole university community, provide security in the information, availability of the service at any time, from any place and from any device, avoid high costs in infrastructure and service support. In November 2013 the university migrated to Google Apps for Education to have a stable platform, unlimited storage capacity and Google technical support. In order adopt Google Apps for Education we trained teachers, administrators and students in communication and collaboration in the digital environment proving very helpful according to the opinion of the trained. However, reports indicate that most members of the university community do not use Google Apps for Education. This situation forces us to study and identify the factors that impede internal communication in the digital environment and because members of the university community act with skepticism to use emerging technologies that can improve the management and services offered by the university.

2. Literature Review

The purpose of internal communication is to motivate and integrate the workers of an organization this purpose can also be applied in universities. However, previous research reveals that the internal communication in the University, as object of study, is still in an initial phase (García Orta, 2012). In that sense, it is recommended that the development of an internal communication plan in the university and its permanent updating should be the result of a study and analysis of the representatives of all levels of the university (Molina Álvarez & González Rivero, 2012). The trend in internal communication is to use digital media that multiply the options and enhance the traditional media. For example, e-mail is able to guide text, audio, and video in the same space while offering interactivity and immediacy (García Orta, 2012). It is important to take advantage of the digital media through a planned, professional, and successful management; instead, their ignorance can lead to the disintegration of the organization (Fernández Beltrán, 2007). Many digital media are currently supported by Cloud Computing platforms and applications. The National Institute of Standards and Technology (NIST) defines Cloud computing as “a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction”. It is becoming increasingly difficult to ignore cloud computing technology in education context (Saadatdoost, Sim, Jafarkarimi, Hee, & Saadatdoost, 2014). The Software as a Service (SaaS) is the most popular Cloud model adopted by higher education institutions and has the potential to provide students with improved academic experience by providing them with anytime anywhere access to learning, communication and collaboration materials (Akande & Van Belle, 2016). Google Apps for Education is a free suite of hosted communication and collaboration applications designed for schools and universities. Google Apps includes Gmail (webmail services), Calendar (shared calendaring), Google Docs (online document, spreadsheet, presentation, form creation and sharing), Google Hangouts (live video conferencing and messaging), Google Groups (group communication and web forums), Google Classroom (collaboration tool for teachers and students), Google Drive (online hard drive where you can store all your files) and Google Sites (team website creation with videos, images, gadgets and documents integration), as well as administrative tools, customer support, and access to APIs to integrate Google Apps with existing IT systems. Several universities aware of the advantages of Cloud Computing have outsourced the E-mail service, adopting agreements, for example, with Google to use Gmail, with it, many operating problems, infrastructure, support, costs, are absorbed by that solution in the cloud (Cristian Ocaña, 2012). The additional capabilities of Google Apps for Education allow to universities members finding ways to innovate and work together in good practices of communication and collaboration. For example, traditional ground-based courses offer nothing in terms of group collaboration outside of the classroom. By using Google Sites, Groups and Documents, students will be able to setup secure group web sites where they can share and work outside of classroom (Lindoo, 2009). Many college instructors use PowerPoint and deliver course materials in a lecture format, making active learning less likely. One way to incorporate active learning in a college classroom is to use Google presentations. Google presentations that can be edited by multiple people from any location with Internet access (Adkins, 2012).

3. THE INSTITUTION

The National University of San Antonio Abad of the Cusco (UNSAAC) is the second oldest public university in Perú, established in 1692 and located in Cusco city. The university is comprised of 20,000 students and 2,500 faculty and staff. It offers 42 professional schools organized in ten faculties. The network infrastructure of university is comprised of a local area network and wireless network with internet access that is insufficient for the current needs of users' connectivity that has grown exponentially by the emergence of mobile devices and new internet applications. Some worrying data indicate that out of every 10 students 2 do not have a computer and with respect to Internet access the third part of undergraduate students access the Internet from a public Internet booth. For example, about half of all undergraduate students have not received computer training and are self-taught or peer-assisted. In general the knowledge of word processors, spreadsheets, databases, image processing, multimedia editing, internet browsers and email of half the members of the university are between basic and beginner. Considering the deficient computer infrastructure and low level of digital competences of university members triggers a state of crisis in the use of ICT in the university.

4. Problem Definition

The adequate management of internal communication leads us to improve the commitment of staff to the university and generate a climate of trust and motivation. Internal communication occupies an essential place in the strategic plans of universities and is a complex task, since in this ambit sociologically diverse groups with different demands

and expectations coexist (Herranz de la Casa, Tapia Frade, & Vicente Lázaro, 2009). The internal communication in the University, as object of study, is still in an initial phase (García Orta, 2012). This fact is corroborated in the National University of San Antonio Abad of Cusco where a single investigation on internal communication is identified and reveals that the communications office does not have enough personnel and budget, causing that the internal communication channels simply fulfill an informative function. This situation avoids the dialogue and a true communication between the members of the university (Muñiz Tupayachi, 1987). Almost 30 years have passed since the previous study was conducted and it is necessary to answer the following questions: What is the current state of internal communication? Is it possible to strategically use technologies to modernize and innovated internal communication?

5. Purpose of the Study

The purpose of this study is to diagnose the state of internal communication and determine in what measure Google Apps for Education substantially improves internal communication among members of the university community of the National University of San Antonio Abad of the Cusco. To achieve this purpose, we must analyze whether the use of Google Apps for Education influences the improvement of the downward, upward, horizontal and transversal message flow in the internal communication. It is also necessary to evaluate whether Google Apps for Education simplifies the variety of classical media and increases the use of digital media in internal university communication. The study was guided by the following three hypotheses:

H1: The use of Google Apps for Education improves the flow of messages ascending, descending, horizontal and transversal in the internal communication between members of the university community.

H2: Using Google Apps for Education simplifies the variety of traditional media in internal communication between members of the university community.

H3: Using Google Apps for Education increases the use of digital media in internal communication between members of the university community.

6. Related works

Research on internal communication in the Universities of Peru we have located the following: A scientific article "Internal communication tools at the University of the Andes, Trujillo" concludes that the members of the university community do not always use the tools of internal communication to give information about academic, administrative, extension and research activities (Vásquez, 2015). The Pontifical Catholic University of Peru through the Institutional Communication Department is a pioneer in developing strategic planning and internal communication policies in the university. At the University of San Martín de Porres - Lima the master's students make use of Google Sites and discover that it is a vehicle of communication and generator of new communication skills (Galantini Vignes, 2015). International experiences such as Pima Community College - USA where they got to improve the communication between the members of the university. For example, using Google Hangouts has allowed for quick and easy communication in counseling, advising, and tutoring activities (Mendoza, 2015). Google Apps as solution of communication issues in educational process (Sviridova, Sviridova, & Tymoshenko, 2011). The use of Google Apps services (mail, Drive Documents, calendar and sites) is frequent among teachers but between teachers and their students are less frequent; the factors may be that students do not have much experience in handling digital information and preferred to use face to face communication (Owayid & Uden, 2014). In Al Buraimi University College (BUC) reveals that Google Apps is positively perceived by the teaching and administrative staff facilitating the communication of their daily activities, being the application of greater use Gmail also affirms that a future work would be to study the impact that Google Apps has on the Students (Al-Emran & Iqbal Malik, 2016). The adoption of Google Apps for Education in University of Rhode Island was necessary to comply with the requirements of digital communications proposed NETP 2016 (National Education Technology Plan) de EE.UU (G. Edward Crane, 2016). Many universities are outsourcing their IT services as the case of institutional e-mail we can mention the migration experience to Google Apps for Education of Valparaiso University that meant cost savings in the operation and maintenance of mail service, in addition to offering improvements in functionality regarding of the previous system (Klein, Orelup, & Smith, 2012). Arizona State University (ASU) is pleased to continue working with Google and offer Google Apps for Education to ASU's 65000 student community (Barlow & Lane, 2007). Colorado State University successful migration to Google Apps for Education teachers and students are satisfied and enthusiastic about the communication and collaboration service recommend that other universities replace their previous systems (Herrick, 2009). Lehigh University migrated of Oracle Calendar to Google Calendar appreciating their ability to access to calendars from anywhere, their ability to create and control multiple calendars, the ease of use, synchronization with mobile devices, and sharing calendars between university

departments (Lewis & Kimmel-Smith, 2011). In Spain also important studies exist as the management of the new internal communication of the universities of the Valencian Community applying ICT (Fernández Beltrán, 2007). Universities are going through a period of change to adapt to a new reality and incorporate Web 2.0 tools into their communication processes (Barquero Cabrero, 2015). Andalusian public universities make use of social networks Facebook and Twitter (Simón Onieva, 2016). The internal institutional communication university advances and consolidates in the universities of Madrid (Gómez Quijano & Zapata Palacios, 2016). In Colombia the University of Ibagué, carried out the study internal communication in the digital environment (Osorio, 2015).

7. Methodology

The research is descriptive and explanatory level used the research design quasi experimental, with post-test, with comparison group. The study population consisted of more than 14700 members of the university community among teachers, administrative staff and students, the experimental group consisted of 152 participants and the control group by 212 participants. The experimental group consists of users who regularly use Google Apps for Education. The control group is made up of users who do not use Google Apps for Education. Due to the nature of the research design and objectives, we used non-probabilistic sampling with direct or non-random selection. The variables studied were computer infrastructure, internal communication, communication flows (ascending, descending, horizontal and transverse), use of classic media and digital media and use of Google Apps for Education at the National University of San Antonio Abad of Cusco.

8. Instrument

To collect data for the experimental group, online questionnaire-type surveys created using Google Apps forms will be used, this survey can only be accessed by users who have access to the Software as a Google Apps Service. For the control group, questionnaire type surveys in physical format will be used. For verify of using the Software as a Google Apps Service, the reporting tool of the Google Apps administration console is used. We used instruments for documentary and content analysis, bibliographic records, interviews, direct observation of the facts. Once completed the surveys to the experimental and control groups will proceed to consolidate the data using SPSS Software and Microsoft Excel. This process includes the classification, recording and coding of the data. For the analysis and interpretation, logical techniques such as Induction, deduction, analysis and synthesis will be used. For the statistical test, descriptive statistics will be used using, mean, maximum, minimum, standard deviation, frequency and contingency table. Also used the chi-square statistic with a significance of 0.05 probabilities.

9. Results and Discussion

The members of the university community do not know which office is responsible for the management of internal communication. Downward communication is unidirectional, (90%) of the respondents indicate a low frequency of interaction with their university's leadership, say they feel little informed and the university's leadership prefer to use traditional channels to communicate. In the upward communication respondents feel regularly valued when they share information with their authorities, there is little empathy in the communication between students and authorities also prefer to use traditional channels. Horizontal communication in general is good and transversal is regular but Informal communication is high. The traditional channels carriers are: face to face meetings, blackboard or bulletin board, reports on paper, brochures and posters. Face-to-face meetings are most preferred but occur infrequently. In the case of digital channels, the most used are email and social networks. The (85.0%) of the respondents considered being willing to use ICT with the purpose of improving internal communication. However, (80%) of the respondents indicate that the authorities do not encourage the use of ICT in university activities. On the use of digital media such as the Institutional Web, Intranet, Blogs, Wikis, Podcasting and videoconferences for the (45%) of the respondents indicate not knowing them or not using it. The uses of ICT are positively valued but their actual use has certain shortcomings.

9.1 Infrastructure and IT resources for internal communication

Reiterating that the ICT resources in the university are limited and the level of knowledge in computer applications of the university members is low. Members of the university in a good proportion have computers and Internet access but many of them assume that it is sufficient know a word processor and surf in Internet. It is imperative to increase the capacities of ICT tools both to teachers and students of the university (Valcárcel Muñoz Repiso & Arras Vota, 2010). An important result is shown in Figure 1 where it is illustrated that users accessing Google Apps for Education have a higher level of knowledge of ICT tools. Therefore, it is necessary to develop ICT training programs so that university members can easily adopt digital tools for internal communication.

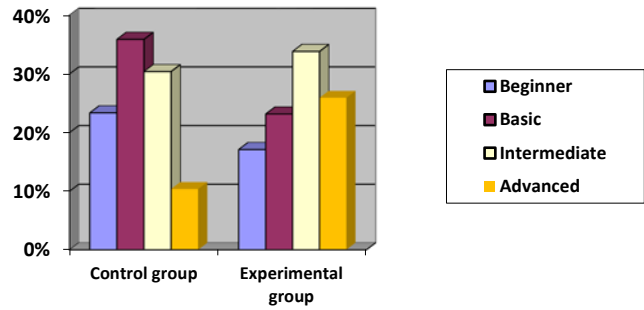


Figure 1. Level of knowledge of ICT tools in UNSAAC

9.2 Responsible for the management of internal communication

The results show that the members of the university show a diversity of responses, but (35%) indicate that they do not know the office responsible for managing internal communication. The Office of Public Relations is probably in charge of internal communication, but only (15%) recognizes it for that work. The (34%) of the Teaching and Administrative Staff indicates that the Office of Personnel is in charge of internal communication. The (27%) of students consider that the Office of University Welfare is responsible for internal communication. This problem occurs in many universities where internal communication is still the activity that receives less communicative resources and little temporal dedication on the part of university governing bodies (Fernández Beltrán, 2007). Figure 2 shows the diversity of answers about which office is responsible for the management of internal communication.

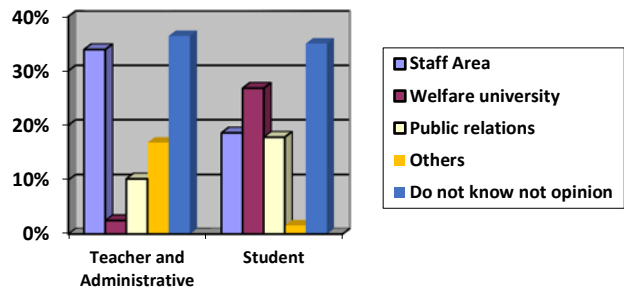


Figure 2. Responsible for the management of internal communication at UNSAAC

9.3 Flow of messages descending, ascending, horizontal and transversal in the internal communication

In the flow of messages in the downward communication the 50% of university members appreciate how to regulate the clarity of the messages received from their authorities and a worrying fact is that the (28%) of students appreciate as deficient or unclear the message of their authorities. Then, authorities should avoid communicating with haste and vagueness, not overdoing the use of technical terms or excess jargon. The (90%) of the members of the university consider that the interaction and communication with the authorities both individual and in group is infrequent. A similar fact occurs with the students in the European University Miguel de Cervantes who claim to feel in general terms little informed about what happens in the university (Herranz de la Casa et al., 2009). In the message flow in the upstream communication the (77%) of teachers and administrative staff considers having a good communication with their immediate superior boss. In the case of students, (68%) indicates that there is no good communication; therefore, there is little empathy in the communication with their authorities. It is necessary to increase meetings between authorities and students. With respect to horizontal and transversal message flow, it was found that (51%) of the members of the university indicate that communication with their companions is good. For Contrast of the H1 hypothesis: The use of Google Apps for Education improves the flow of messages ascending, descending, horizontal and transversal in the internal communication between members of the university community. It is necessary to decompose the variable "message flow" into its dimensions and indicators that are susceptible to be analyzed through statistical methods, as shown in Table 1. Following:

Table 1. Dimensions and indicators of the variable "Message flow"

Dimension	Indicators	Value	df	Asymp. Sig. (2-sided)
Downflow message flow	Level of clarity of received messages	5.031	3	0.170
	Level of interaction and communication	0.004	1	0.949
	Quality of the language used	0.453	2	0.797
	Level of periodicity of notifications	41.116	1	0.000 *
Ascending message flow	Level of ease of information sharing	7.204	3	0.066
	Level of acceptance in communication	0.401	1	0.526
Horizontal Message Flow	Level of communication with colleagues from the same area	5.183	3	0.159
	Level of communication with peers from other areas	10.139	3	0,017 *
Transversal message flow	Level of ease of communication with any area	1.334 ^a	2	0.513
	Quality of information of any dependency	18.681 ^a	3	0.000 *

* There is significant differences $p < 0.05$

Significant statistical differences between the experimental and control groups were found in the following indicators: level of periodicity of notifications, level of communication with peers from other areas and quality of information of any dependency. Considering that only three indicators of ten have found significant differences we can say that it is not possible to accept the hypothesis that Google Apps for Education improves the flow of messages. However an encouraging sign is shown in Figure 3 where users using Google Apps for Education receive information more frequently of the University.

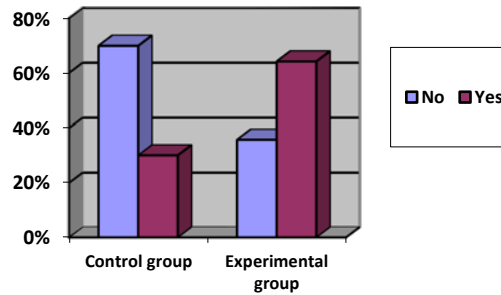


Figure 3. Receives periodic information or notifications

9.4 Use of traditional media in internal communication

The Teaching and Administrative Staff indicates to communicate with the other members of the organization using mainly the traditional supports: the meeting face to face in (34%), reports (19%), instructive (11%). In the case of students, the most used traditional supports are: blackboard or bulletin board (20%), face-to-face meetings (16%), brochures and posters (13%). For Contrast of the H2 hypothesis: using Google Apps for Education simplifies the variety of traditional media in internal communication between members of the university community. Table 2 shows the indicators of the variable use of traditional media in the internal communication.

Table 2. Indicators of the variable use of traditional media

Indicators	Value	Df	Asymp. Sig. (2-sided)
Frequently used traditional media	13.293	6	0.059 *
Frequency of working meetings	13.217	2	0.051 *

* There is significant differences $p < 0.05$

Significant statistical differences between the experimental and control groups were found in the following indicators: frequently used traditional media and frequency of working meetings. The evidence indicates significant statistical differences in the indicators, but the results do not express a clear tendency to simplify the variety of traditional means when using Google for Education. Therefore, the H2 hypothesis is not accepted.

9.5 Use of digital media in internal communication

Teaching and administrative personnel use the following digital media: electronic mail (64%) and social networks (16%). In the case of students the most used digital media are electronic mail (40%) and social networks (31%). A fact to emphasize is the preference for the Social Networks of the students compared with the teachers. For Contrast of the H3 hypothesis: Using Google Apps for Education increases the use of digital media in internal communication between members of the university community. Table 3 shows the indicators of the variable use of digital media in the internal communication.

Table 3. Indicators of the variable use of digital media

Indicators	Value	Df	Asymp. Sig. (2-sided)
Frequently used digital media	25.819	7	0.001 *
Level of importance of digital support	21.152	5	0.001 *

* There is significant differences $p < 0.05$

Significant statistical differences between the experimental and control groups were found in the following indicators: frequently used digital media and level of importance of digital support. The evidence indicates significant statistical differences in the indicators then there is a tendency to increase the use of digital media when we use Google App for Education. Therefore, the H3 hypothesis is accepted. However, in Figure 4. An alarming fact is that most do not know or do not use digital media such as Institutional Web, Intranet, Wiki, Videoconference and podcasting.

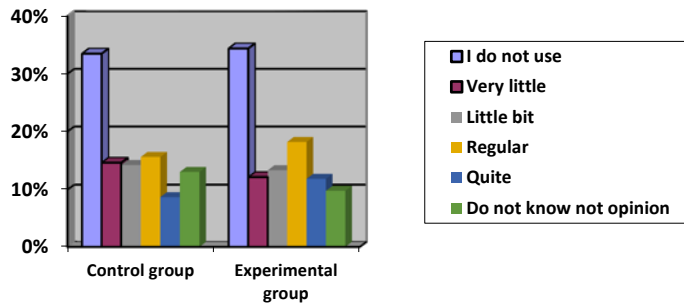


Figure 4. Use of digital media (Web, Intranet, Videoconference, Wiki)

9.6 Using the Google App for Education in College

Regular use per week of Google Apps for Education is done by approximately 2000 users who represent (14%) 18,000 students and (30%) workers. Table 4 shows detailed data about using Google Apps for Education:

Table 4. Google Apps Usage Report at UNSAAC

Description	Amount
Users who activated your account	7175
Average user access per day	350
Average number of emails received per day	643
Average number of emails sent per day	172
Storage used	5.5 Tera Bytes

The following figure shows the growing use of Google Apps with its main tools such as Gmail, Drive, Calendar, Google+ and Classroom.

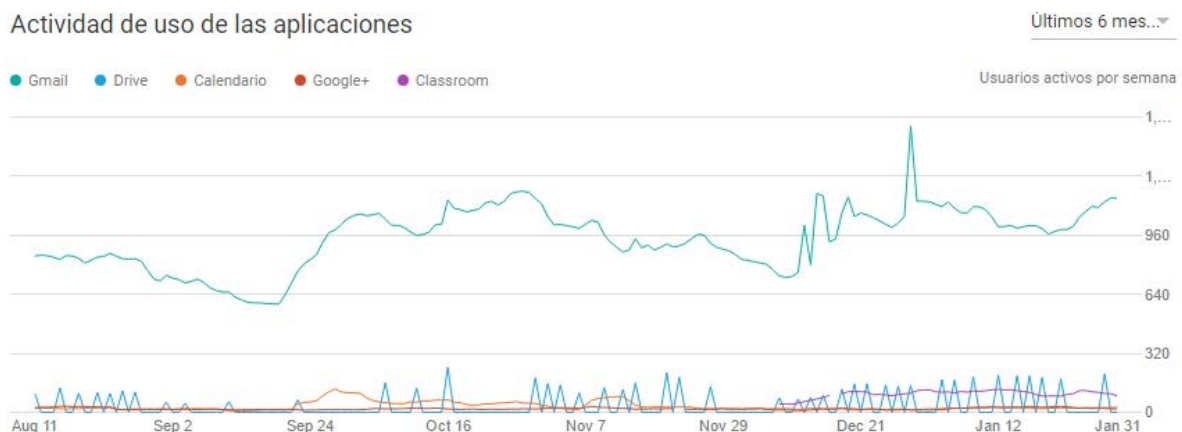


Figure 5. Using Google Apps at UNSAAC

10. Conclusions and Future Work

The use of the Software as a Service Google Apps for Education does not substantially improve internal communication among members of the university community of the National University of San Antonio Abad of Cusco. The downstream communication is unidirectional and there is little feedback in communication. In the upward communication there are difficulties because most of the students feel little informed and listened to by their authorities. In the case of horizontal and transverse communication there is empathy of communication between companions but they encourage informal communication. It uses a variety of traditional and digital media that does not allow a clear conclusion of the type of preferred communication medium. The limitations in computer infrastructure and the low level of technological competences of the members of the university affect the adoption of digital support in internal communication. Of the 30000 accounts available in Google Apps for Educations only (12%) have enabled it. It is necessary to develop an internal communication plan with the participation of all the actors of the university community and to achieve the use of digital supports that enhance the classical supports.

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Biography

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