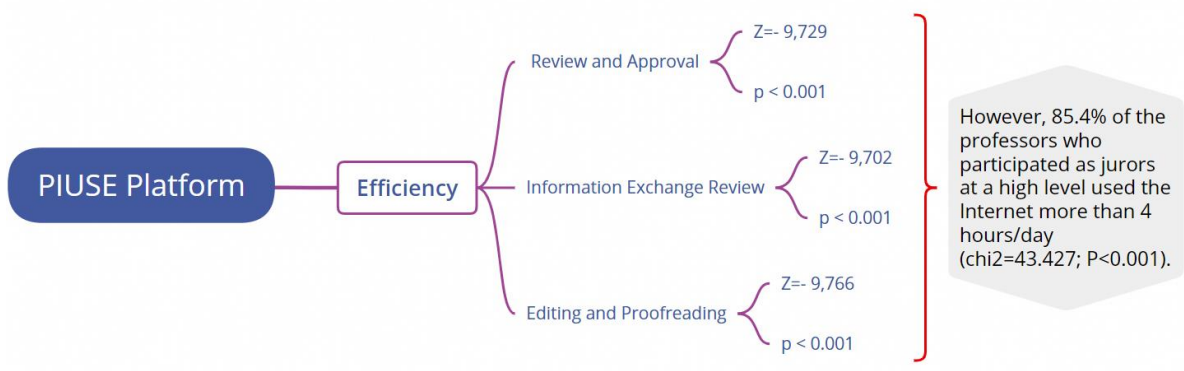# The effectiveness of the PIUSE platform in research management and its relationship with the intensive use of the internet by thesis committee members and advisors

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Graphical Abstract

Abstract

The study aimed to evaluate the effectiveness of the PIUSE platform in managing research processes and the excessive use of the internet by advisors and thesis committee members in the second specialization program at the Faculty of Education of the National University of Altiplano in Puno. This research had a quasi-experimental design, conducted with 125 professors who participated as committee members and/or advisors, with an average age of 46.86±7.87 years. Three instruments were used in the study: a questionnaire for the review of research projects and reports (α=0.967); a questionnaire for the approval of research projects and reports (α=0.894); and a questionnaire for the defense of research projects and reports (α=0.882). The Wilcoxon test was used to compare two related samples before and after the implementation of the PIUSE platform, and Pearson's chi-square test was used to examine the association between internet use and the level of participation. Analyses were performed using IBM SPSS v.25. The PIUSE platform, built with Google tools, significantly influenced the efficiency in the review and approval of research projects and reports (Z=-9.729; p<0.001), the review of information exchange (Z=-9.702; p<0.001), and the editing and correction during the review of research projects and reports (Z=-9.766; p<0.001). However, 85.4% of the professors who participated as committee members at a high level used the internet for more than 4 hours/day (α2=43.427; P<0.001).

Keywords: Excessive Internet Use. Thesis Advisors. Efficiency. PIUSE. Google. Visual Health.

INTRODUCTION

Over the past two decades, Google has revolutionized how we communicate and access information[1]. The use of Google's tools in global management has been profound and transformative. A notable transformation was the introduction of Workspace, which revolutionized internal communication management and collaboration within organizations[2]. With applications like Gmail, Google Calendar, Google Drive, Google Docs, Google Sheets, Google Slides, and others, Google provides a comprehensive suite of tools for real-time communication, task planning, and file storage[3], enabling teams to operate more effectively and in coordination, regardless of their physical location[4].

Google tools are essential for managing research processes in informatics. They offer a complete set of applications that facilitate the collection, organization, and collaboration of information[5]. Google Drive and Google Docs provide an online collaborative environment where research teams can create, edit, and share documents simultaneously, streamlining the flow of information and promoting teamwork[6,7]. Additionally, Google Forms offers a valuable tool for data collection and conducting surveys, simplifying information gathering and report generation. These Google tools optimize the research process by facilitating access to resources and collaboration among researchers, advi-sors, and committee members, improving both the efficiency and quality of results obtained in the investigative field[2].

The pandemic had a significant impact on academic management in universities[8] across Peru, creating a series of challenges and opportunities. The abrupt transition to non-face-to-face modalities required rapid and effective adaptation by universities, faculty, and students[9,10]. The current situation highlighted the importance of improving both the technological and pedagogical skills of educators, as well as ensuring equitable access to educational resources and digital tools for all students, especially those living in rural or low-income areas[11].

However, the excessive use of the internet by university professors and students can have various negative consequences for their visual health[12]. Prolonged exposure to computer, tablet, and smartphone screens can lead to the development of digital eye strain, which manifests in symptoms such as dry eyes, blurred vision, headaches, and eye discomfort[13]. Excessive screen time contributes to a reduction in blinking, which exacerbates dryness and discomfort[13,14]. The combination of long hours spent on academic work, research, and online lesson preparation without adequate breaks to rest the eyes increases the risk of developing these visual conditions, thereby affecting the overall well-being and

quality of life of university faculty[9].

The management of research projects and reports in the Second Specialization academic program of the Faculty of Education Sciences at the National University of Altiplano was interrupted for several months due to the mandatory social isolation decreed by the Peruvian government through Supreme Decree No. 044-2020-PCM. This decree established a National State of Emergency and mandated mandatory social isolation, also known as quarantine, due to the serious situation the country was facing as a result of the COVID-19 outbreak[15,16]. This period of isolation was extended through additional Supreme Decrees.

With the aim of rapidly implementing a system for the non-presential management of research projects, reports, and thesis defenses, the Second Specialization academic program created the Digital Research Platform of the Second Specialization Unit (PIUSE). This platform utilizes Google tools such as Google Docs, Google Forms, Google Sheets, Google Sites, and Google Meet. In this context, the objective of this research was to evaluate the effectiveness of Google tools in managing the non-presential thesis defense processes and the excessive use of the internet in the post-COVID-19 pandemic period by university professors who participated as committee members at the National University of Altiplano in Puno.

METHOD

The study involved 125 university professors from the Second Specialization program at the Faculty of Education Sciences (FCEDUC) of the National University of Altiplano in Puno (UNAP). The average age of the faculty was 46.86 ± 7.87 years, with the majority (65.6%) between 40 and 55 years old. Of the total participants, 66 (52.8%) were men and 59 (47.2%) were women. Most of the FCEDUC professors (72.0%) reported using the internet for more than 4 hours daily, while the majority of participating professors (76.8%) indicated having an intermediate level of competence in using ICT and a similar level of training in using Google tools (77.6%) (Table 1).

Table 1 - Sociodemographic Variables.

Sociodemographic variables	X±SD	N	%
Age	46.86±7.87		
Under 40 years old		24	19.2
From 40 to 55 years old		82	65.6
Over 55 years old		19	15.2
Gender			
Female		59	47.2
Male		66	52.8
Internet use by committee members			
More than 4 hours/day		90	72.0
Between 3 and 4 hours/day		30	24.0
Less than 3 hours/day		5	4.0

to be continued...

... continuation table 1

Sociodemographic variables	X±DE	N	%
Proficiency in ICT Use			
High		24	19.2
Medium		96	76.8
Low		5	4.0
Training in the Use of Google Tools			
High		21	16.8
Medium		97	77.6
Low		7	5.6

In response to the mandatory social isolation decreed by the Peruvian government through Supreme Decree No. 044-2020-PCM, the Second Specialization program of FCEDUC implemented the Digital Research Platform of the Second Specialization Unit (PIUSE), developed using Google tools such as Google Docs, Google Forms, Google Sheets, Google Calendar, Google Sites, and Google Meet. The PIUSE platform includes regulations, annexes, sections for submitting thesis projects and research reports, and a section for requesting thesis support, as well as directories of committee members and advisors. Access to the PIUSE platform is available via a QR code.

In this study, the instruments were administered through Google Forms. Participants were informed about the purpose of the study, the importance of completing all questionnaires, and the benefits that the research results would bring to improve the management of research projects, research reports, and support for programs. The researchers developed questions to assess sociodemographic variables, including gender (female/male), daily internet use (more than 4 hours, between 3 and 4 hours, and less than 3 hours), age (in years), ICT proficiency (high, medium, and low), and training in the use of Google tools (high, medium, and low).

In this study, each professor who participated as a committee members or advisor in the Second Specialization program at FCEDUC was evaluated using three instruments. The evaluation criteria included their experience in reviewing the project and/or report, approving the project and/or report, and supporting the project and/or research report before the pandemic (without PIUSE) and after the pandemic (with PIUSE). The assessment was conducted between September and December 2023.

The study evaluated the effectiveness of Google tools using the Google Tools Usage Questionnaire (PIUSE) in supporting non-presential thesis defenses. This instrument also includes the four mentioned factors: efficiency, information exchange, editing and correction, and interaction in the presentation of projects and reports. The factors were assessed through eight items on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

The questionnaire items evaluated various crucial aspects of the review process for research projects and reports. These included efficiency in the review process, assessing how digital tools optimize time and resources used in the correction and evaluation of documents. Information exchange between students and committee members was also analyzed, highlighting how technological platforms enable fluid and continuous communication regardless of the geographical location of participants. Another important aspect was real-time editing, which eliminates the need for in-person meetings and facilitates simultaneous collaboration on documents, allowing committee members to make instant corrections and comments.

Additionally, the PIUSE platform was highlighted for its ability to allow committee mem-

bers not only to read the comments of other members but also to identify similarities and discrepancies in observations, enriching the review process. This feature promotes a more collaborative and consensual approach to evaluation, ensuring that all perspectives are considered and that final decisions are well-founded. Together, these digital tools have transformed the way projects and reports are reviewed, making the process more efficient, accessible, and collaborative. The internal consistency of this questionnaire was α = 0.873.

To assess the effectiveness of Google to-ols in managing non-presential thesis defense processes, the Wilcoxon signed-rank test was used, a non-parametric statistical method employed to compare medians. To evaluate internet usage by thesis committee members based on participation levels, a cross-tabulation was conducted, along with Pearson's chi-square analysis. This analysis allowed for determining whether there was a significant association between these variables. All statistical analyses in this study were evaluated with a p-value less than the level of statistical significance (P<0.05).

RESULTS

Table 2 - Association between internet usage and participation levels as a committee member in thesis defenses.

		Internet Usage by Thesis Committee Members			
		Less than 3 hours/day	From 3 to 4 hours/day	More than 4 hours/day	Total
Participation as a Judge	Low	3	3	4	10
		30.0%	30.0%	40.0%	100.0%
	Medium	2	15	16	33
		6.1%	45.5%	48.5%	100.0%
	High	0	12	70	82
		0.0%	14.6%	85.4%	100.0%
Total		5	30	90	125
		4.0%	24.0%	72.0%	100.0%

From Table 2, it can be deduced that 85.4% of professors who participated intensively as committee members used the internet for more than 4 hours daily, while 30% of professors with low participation used the internet for less than 3 hours daily. These results indicate a statistically significant relationship between internet usage and the level of participation as a thesis committee member ($X2 = 43.427$; $P < 0.001$).

Table 3 - Effectiveness of Google Tools (PIUSE) in Non-Presential Thesis Defenses at the Faculty of Education Sciences of the National University of Altiplano.

Effectiveness of PIUSE in Non-Presential Thesis Defenses	Pre-test	Post-test	Z	P
Effectiveness	3.81 ± 0.704	7.30 ± 1.454	-9.473A	.000*
Information Exchange	4.07 ± 0.764	7.59 ± 1.551	-9.588A	.000*
Editing and Correction	3.34 ± 0.729	7.23 ± 1.617	-9.661A	.000*
Interaction	3.39 ± 0.728	7.26 ± 1.560	-9.587A	.000*

Source: Research data.
a Wilcoxon Signed-Rank Test (Z)
$p < 0.0001$

The PIUSE platform, developed using Google tools, significantly influenced effectiveness ($Z = -9.473$; $p < 0.001$); information exchange ($Z = -9.588$; $p < 0.001$); editing and correction ($Z = -9.661$; $p < 0.001$); and interaction ($Z = -9.587$; $p < 0.001$) during the review and approval of the project and report for non-presential thesis defenses. The effectiveness of the PIUSE platform in information exchange, editing and correction, and interaction are crucial elements during the review and approval process for non-presential thesis defenses.

The effectiveness in information exchange ensures that all parties involved, including students, advisors, and evaluators, are aligned and have access to the necessary information in real-time, facilitating informed decision-making. Editing and correction are essential for ensuring the clarity, coherence, and accuracy of the document, which is vital for a fair understanding and evaluation of the work presented. Furthermore, continuous interaction among the involved parties allows for resolving doubts, receiving constructive feedback, and making necessary adjustments in a timely manner, thereby improving the quality of the project.

DISCUSSION

The implementation of the PIUSE platform, developed with Google tools, has proven to be highly effective in various critical aspects of the non-presential thesis review and approval process. The statistical data reflect a significant influence of PIUSE on effectiveness ($Z = -9.473$; $p < 0.001$), information exchange ($Z = -9.588$; $p < 0.001$), editing and correction ($Z = -9.661$; $p < 0.001$), and interaction ($Z = -9.587$; $p < 0.001$). These results suggest that PIUSE not only facilitates administrative and academic efficiency but also enhances the quality of collaboration among participants.

PIUSE's ability to optimize the flow of information and enable real-time corrections and edits is particularly relevant in the context of distance education, where fluid and effective interaction is essential. The findings of this study align closely with previous research in the field, supporting similar con-

clusions both methodologically and substantively. Several prior studies have documented comparable patterns and trends, further reinforcing the validity and reliability of the results obtained[2,3,17-19].

Consequently, the use of this platform not only results in more agile and accurate management of thesis projects but also fosters a more dynamic and cooperative learning environment, contributing to the overall improvement of academic processes in non-presential settings. The implementation of this technological platform in thesis project management has not only significantly enhanced the speed and precision in conducting these processes but has also promoted a more dynamic and cooperative learning environment[19,20]. This improved environment is crucial for distance education, where the lack of physical interaction can be a significant barrier[21].

The platform allows for more efficient information exchange and facilitates real-time collaboration between students and advisors, resulting in an overall improvement in academic processes. By providing tools that enable simultaneous document editing and correction, as well as detailed tracking of project progress, the platform contributes to more organized and effective management[6,17,18]. In this context, the adoption of advanced technologies not only optimizes administrative procedures but also enriches the educational experience, offering students more robust and accessible support in their academic activities[6,18]. These improvements are particularly important in non-presential environments, where the ability to maintain fluid and effective communication is essential for academic success.

The statistically significant association between internet usage and the level of participation as a thesis defense committee member among university faculty ($X^2 = 43.427$; P < 0.001) suggests that the integration of digital tools and the need for connectivity significantly influenced academic activities during the pandemic. This correlation implies that faculty members who use the internet intensively, for more than 4 hours per day, tend to participate more actively as committee members in thesis evaluations. This phenomenon can be attributed to the increased familiarity and competence in digital platforms acquired during the pandemic, facilitating the management of academic tasks remotely[6].

However, this dependence also presents challenges, such as the risk of digital overload and a potential decline in the quality of academic interaction due to technological fatigue[3]. Excessive internet use has been significantly associated with increased levels of anxiety and depression, as well as decreased sleep quality[22,23]. Prolonged exposure to electronic devices and constant interaction with social media and online content can lead to overstimulation of the brain, making it difficult to relax and rest properly[9,24]. Therefore, it is crucial for educational institutions to develop continuous training strategies in digital competencies and establish balanced technology usage policies to ensure that increased virtual participation does not compromise the quality of education and the mental health of faculty members.

CONCLUSION

The implementation of this technological platform has proven to be highly effective in managing thesis projects in non-presential environments, significantly improving the speed and accuracy of these processes. The platform's ability to facilitate real-time information exchange and collaboration between students and advisors has promoted a more dynamic and cooperative learning environment, overcoming one of the main barriers of distance education: the lack of physical interaction. The tools provided, including simultaneous document editing and correction and detailed tracking of project progress, contribute to more organized and efficient management.

This approach not only optimizes administrative procedures but also enriches the educational experience by providing robust and accessible support to students. These improvements are especially critical in non-presential environments, where maintaining fluid and effective communication is essential for academic success. Therefore, the adoption of this advanced technology represents a significant step forward in improving both academic and administrative processes in distance education.

The statistical association between internet usage and the level of participation of university faculty as members of thesis defense committees during the pandemic (X^2=43.427; P<0.001) highlights the significant impact of digital tools and connectivity on academic activities. Faculty who use the internet intensively, exceeding 4 hours daily, show greater participation in thesis evaluations, which can be attributed to their increased familiarity and competence with digital platforms acquired during the pandemic. However, this dependence on digital technologies presents important challenges, such as the risk of digital overload and the potential decline in the quality of academic interaction due to technological fatigue.

Overexposure to the internet has been linked to increased levels of anxiety and depression, as well as reduced sleep quality. To mitigate these negative effects, it is essential that educational institutions implement continuous training strategies in digital competencies and establish policies for balanced technology use. This will ensure that increased virtual participation does not compromise the quality of education or the mental health of faculty members.

CRediT author statement

Conceptualization: Miranda, PSY; Vallejo, NKP; Mendizabal, BKS; Betancur, HNC. Methodology: Miranda, PSY; Betancur, HNC. Validation: Miranda, PSY; Vallejo, NKP. Statistical analysis: Mendizabal, BKS; Betancur, HNC. Formal analysis: Miranda, PSY; Vallejo, NKP; Mendizabal, BKS; Betancur, HNC. Investigation: Miranda, PSY; Vallejo, NKP; Mendizabal, BKS; Betancur, HNC. Resources: Miranda, PSY; Vallejo, NKP; Mendizabal, BKS; Betancur, HNC. Writing-preparation of the original draft: NKP; Mendizabal, BKS; Betancur, HNC. Review and editing of the writing: Miranda, PSY; Vallejo, NKP; Betancur, HNC. Visualization: Miranda, PSY; Vallejo, NKP. Supervision: Miranda, PSY; Vallejo, NKP; Mendizabal, BKS; Betancur, HNC. Project management: Miranda, PSY; Vallejo, NKP; Mendizabal, BKS.

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