ORIGINAL ARTICLE

Development of pedagogical leadership through collaborative work in university teaching staff

ABSTRACT

The aim of this research paper is to determine the degree of pedagogical leadership development through collaborative work in teaching staff of the School of Sciences from Universidad Nacional de Ingeniería (UNI) in 2020, under a quasi-experimental research design and a quantitative method. To this end, a control group and an experimental group were considered, and two evaluations were established: a start and final test. An expert-reviewed observation guide was used, with an assessment scale ranging from 1 to 5, consisting of 40 items divided into 5 dimensions. The experimental work consisted of 11 sessions aimed at developing pedagogical leadership, demonstrating that pedagogical leadership experiences a significant development through collaborative work among the teaching staff of this institution.

Keywords: Pedagogical leadership; Collaborative work; Teaching staff.

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INTRODUCTION

Modern society faces various educational challenges due to coexistence in a globalized world; hence the need to identify these challenges to improve the development of society through organizations. Public and private educational institutions are responsible for and must commit to setting education in the right path at all levels, given that it is the foundation of society. Educational organizations' leaders face this unprecedented challenge which is due to the quick changes taking place in educational issues.

Higher education institutions lag behind when they attempt to educate under their traditional rigor in the 21st century, which can be noted in many of Peru's universities. Educational management is an everyday practice which helps develop pre-defined learning goals. Therefore, pedagogical leadership is required to act according to international developments in education.

Pedagogical leadership consists of gathering and influencing others to generate articulation and achieve the institution's purposes and objectives. It also helps strengthen authorities and teaching staff in collaborative or teamwork. Therefore, pedagogical leadership provides guidance to educational institution authorities for improving their organizations and to raise their awareness of internal or external phenomena, so that they identify events that lead to progress, create plans for better institutional management, and channel specific and convenient incentives for their educational communities.

Chambilla Fernández *et al.* (2022) states that leadership is an innovation in the management field which helps mobilize resources, particularly human potential, to improve the quality and dynamics of communication processes for the purpose of achieving organizational excellence. The author adds that pedagogical leaders are able to lead their personnel toward purposes that favor their students' learning.

The other problem affecting education is related to collaborative work. It helps articulate activities from the labor context in a human group, and is related to the aims,

objectives, and results to be attained. It also requires a functional interrelation between the group members and has a labor-related purpose. For this reason, collaborative work has a communicative component and is based on mutual trust and help, strengthening organizations and leading to better results. The relationship between those involved in collaborative work helps achieve high-impact results for institutions. This situation results in the need to demonstrate the relationship between pedagogical leadership and collaborative work in university teaching staff.

The work by Chambilla Fernández *et al.* (2022) claims that there is a positive and highly significant improvement in pedagogical leadership through the implementation of collaborative work. To this end, a collaborative work test was applied throughout eleven sessions. The initial and final test results were compared, both in the control and the experimental group, clearly demonstrating the significant improvement in pedagogical leadership. Thus, it was demonstrated that collaborative workshops help develop pedagogical leadership, which is directly reflected on the teaching staff performance, thereby increasing educational service quality and professional development.

METHOD

This is a cross-sectional quasi-experimental study which considered two intervention groups: control group and experimental group. The data were obtained and processed with statistical analysis software SPSS v. 25. Based on the data obtained, variable normality was evaluated through the Kolmogorov-Smirnov test. Then, a parametric test was administered (Student's t-test for independent samples).

A program consisting of 11 collaborative workshops lasting three hours per session was applied. Tests were applied both at the beginning and the end of each session for both groups.

The results were presented quantitatively because numeric data were analyzed to verify the hypothesis proposed, and to solve the research questions. A significance value lower than 0.05 was considered ($p < 0.05$). Data were collected through an observation sheet with 40

questions grouped into five dimensions, with values in a Likert scale. The data collection instrument was validated by experts in the field, and was applied at two points (before and after the experiment). In addition, Cronbach's alpha was used to determine instrument reliability.

RESULTS

The data collection and validation were carried out through expert judgment, while reliability was tested through Cronbach's alpha. As can be noted in Table 1, the values for the initial evaluations were 0.971 and 0.972, whereas the final evaluations scored 0.931 and 0.971, indicating that the data collection instrument is reliable.

Then, the Kolmorogov-Smirnov normality test was applied to each of the dimensions, finding significance values > 0.05. This confirmed the normality of each of the variables; therefore, the analysis for group comparison was performed through the Student's t-test. Table 2 shows the results to be analyzed below:

The control group and the experimental group were compared. The first evaluation for each dimension resulted in the following data: 0.889, 0.911, 0.927, 0.908, 0.889, and 0.815, respectively. This confirms that there are no significant differences between the control group and the experimental group for each of the dimensions. This is to say, both groups have the same characteristics and, as a result, they may undergo the experiment and it can be determined whether there are any significant differences between them.

The Student's t-test shows correlation coefficients of 0.258, 0.330, 0.577, 0.330, 0.666, and 0.716, respectively, for the control group in each of the dimensions. This shows that there were no significant changes in the control group. However, the correlation coefficient for the experimental group in each of the

Table 1
Reliability of the data collection instrument

	Reliability statistics			
	Control group		**Experimental group**	
Variable	Cronbach's alpha	n	Cronbach's alpha	n
Initial evaluation	0.971	40	0.972	40
Final evaluation	0.931	40	0.971	40

Note. Compiled by author, 2024.

Table 2
Experiment result table

Dimension	Hypothesis	Test	Control gr.	Experimental gr.
Leadership	G	Initial	0.889	
		Final	0.258	0.003
Technical capacity	A	Initial	0.911	
		Final	0.330	0.000
Performance in the ed. institution	B	Initial	0.927	
		Final	0.577	0.000
Emotional management	C	Initial	0.908	
		Final	0.330	0.000
Situational management	D	Initial	0.889	
		Final	0.666	0.000
Problem solving	E	Initial	0.815	
		Final	0.716	0.000

Note. Compiled by author, 2024.

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dimensions was 0.003, 0.000, 0.000, 0.000, and 0.000, respectively. This shows that there was a significant change in each of the dimensions for the experimental group.

DISCUSSION

Pedraja-Rejas *et al.* (2009) state that leadership is an individual's influence on a group of people so that they perform the activities managed by said individual, in order to effectively achieve their shared objectives. They also state that leadership covers management, encouragement, and motivation for a particular team, and involves the existence of a leader to influence and motivate followers.

Zárate (2011) described leadership as an individual's initiative to influence the behavior of those people around them, by managing attitudes, skills, and knowledge that may vary depending on the situation.

Gento Palacios *et al.* (2012) point out that the main concern of educational leadership is promoting the potential of the people who are part of the educational institutions by means of actions oriented to achieving educational quality based on various approaches.

Vizcarra (2016) also states that leadership has had an impact on history, psychodynamics, organizational progress, sociology, among others. Therefore, leadership has an impact that results in leaders having followers who become aware of the importance and value of the results achieved once the assigned tasks have been performed. Leadership makes it possible to channel the followers' particular interests toward the institution's purpose, generating security and admiration. As a result, followers will be motivated to achieve more than what is expected of them.

Meanwhile, Sorados (2010) establishes the difference between a leader and a follower. The author states that "el liderazgo es definido como la influencia que se ejerce sobre otros con determinado propósito y definimos al seguidor como alguien que es influenciado por otros para un determinado propósito" [leadership can be defined as the influence exercised over others with a particular purpose. The follower can thus be defined as someone influenced by others for a particular purpose] (p. 19). In such regard, both a leader and a follower constitute the two sides of a single coin; leadership will only begin when at least one follower decides to follow the individual they want as a leader.

Finally, López (1988) states that leadership is considered to be a duty for the authorities of a public or private institution. Leaders are characterized by qualities such as transforming organizations, making progress possible both inside and outside them. Leaders show skills and strategies that allow them to have a better vision of the company, and incorporate an ethical aspect and principles to the organizational culture, apart from other distinctive characteristics.

Centurión (2016) states that there are two important factors in educational leadership:

- Determining factor: Motivation for power. It is a set of factors derived from the need to achieve a purpose by demonstrating skill and wisdom, and the need to maintain adequate social connections. According to the author, people who display a need for power and influence identify themselves with behaviors such as enjoying and winning a competition, being in charge, facing individuals who do something that they disapprove of, influencing other individuals to follow their lead, and—often—working to achieve more dominance over the events that happen around them.

- Determining factor: Participation of teaching staff in the educational institution management. This is related to a more socio-critical perspective, as the social and cultural environments are also considered. This factor refers to the relationships and mechanisms that emerge within an educational institution. Centurión (2016) states that the critical paradigm interprets the sense of an organization as a theoretical construct limited by the social and cultural environment, as well as by politics. The meanings which are part of the organization and its development must be interpreted, and the

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reasons why reality expresses itself in a particular way must be analyzed.

Redolfo (2015) points out that the factors influencing pedagogical leadership are the following:

- **Individualized consideration.** Linked to the care shown by the pedagogical leader to their staff, in a differentiated manner according to their qualities. It is about being aware of their staff needs to help them make progress.

- **Intellectual stimulation**. Leaders subject their staff to intellectual challenges to stimulate their capabilities and help them face any problem in a different way. They consider innovation to be an opportunity for progress and growth.

- **Inspirational motivation.** Leaders operate under the mindset that, if one truly wants to achieve something, they can. They promote motivating future events that lead to some type of action. To this end, it is necessary to have the ability to detect threats and opportunities.

- **Idealized influence.** It is related to individual integrity. Leaders must be upright, trustworthy, charismatic, and they should create a working style that shares fame, demonstrates persistence toward achieving goals, and creates the feeling that everything is possible. To sum up, idealized influence is a factor that leads to admiration and the conviction to follow someone.

Leader direct collaborative work. Vizcarra (2016) states that, today, there are teams focused on improving effectiveness and efficacy in higher education institutions. This strategy is becoming widely incorporated in various sectors. A team that carries out collaborative work is a well-consolidated group that works toward achieving a concrete goal.

Meanwhile, Sorados Palacios *et al.* (2010) state that collaborative work focuses on aspects such as active participation, reflective contributions, and the ability to continue learning. Collaborative work in higher education institutions must include processes that favor understanding, planning, exercising and reflecting on the tasks to be performed and the way to do so.

In addition, Maldonado Pérez (2007) states that collaborative work establishes an interactive learning paradigm, which nudges students to achieve objectives agreed upon together. This is considered to be a philosophy of interrelation; this one is particularly linked to aspects such as respect for individual contributions and for the other team members.

Panitz and Panitz (1998) state that collaborative work is an interrelation procedure whose main premise is the construction of common agreements. It is about the team members following the premise that they share authority and the responsibility for the activities that they have to carry out as a group. Collaborative work makes it possible for each group member to take in more than what they would be able to learn by themselves. This is possible thanks to the interrelation with the other group members. This type of work will only be possible when the group acts reciprocally and is able to distinguish and compare different ways of thinking and seeing things in order to construct their knowledge (pp. 161-202).

Gros (2000) regards collaborative work as the development in which all the group members become involved and learn together. If the group work is performed cooperatively, the team will be able to internalize the expected knowledge. Here, the group decides how to perform any activity, the procedures to adopt, the division of labor, and the activities to perform. Communication and negotiation will be important to this end.

Maldonado Pérez (2007) established the characteristics of collaborative work based on the teachers that assume the role of mediators. Regarding their role in the group, they are regarded as one more group member. As for the responsibility for the task, it lies in both individuals and the group. Regarding the division of labor, the group performs the task. As for the subtasks, they know that they require joint work. During the process of constructing the final result, they work under the principle that

everything is to be done together and that it will not occur through individual performances under any circumstances. Regarding responsibility for learning, they acknowledge that the group members, with the teacher's support, must comply with the task established. Finally, the type of knowledge is based on reasoning, questioning, and discussing.

In addition, Oropeza (2015) states that one particular characteristic of collaborative work is that, unlike teamwork and cooperative work, it is learning that "se produce cuando los estudiantes y los docentes trabajan juntos para crear el saber… Es una pedagogía que parte de la base de que las personas crean significados juntas y que el proceso las enriquece y las hace crecer" [occurs when students and teachers work together to generate learning… It's a pedagogy that stems from the idea that people create meaning together, and this process enriches them and helps them grow] (p. 44). Collaborative work, in turn, creates a positive interrelation by replacing the term 'individual' with the term 'group'. Thus, the group members perceive that they are related in such a way that it will be impossible for a single member to succeed without the others' help. It is necessary to become aware of the importance of coordinating efforts to end a task.

Arbañil Barrientos (2018) establishes the relationship between pedagogical leadership and collaborative work in a descriptive correlational study using surveys, which concluded that pedagogical leadership is significantly correlated to the school's collaborative work.

Meanwhile, Vásquez Paulini (2017) states that collaborative work promotes the shared benefits to achieve, with positive interdependence as the main foundation. Collaborative work can help generate collective knowledge, and distance learning helps build knowledge. The author mentions the following characteristics per se:

- **Communication.** It consists of the interaction between data and materials. It allows for effective and efficient support and feedback, facilitates analysis, and helps conclusions be more straightforward.

- **Cooperation**. It entails two purposes: to achieve learning and to develop skills for collective work.

- **Teamwork**. It involves learning how to solve problems as a group with skills, leadership, communicative interaction, confidence, solutions, and conflicts.

- **Self-assessment.** It consists of periodical assessment of the tasks performed, verifying whether the objectives proposed have been met, and identifying the transformations taking place over time.

- **Responsibility.** It entails complying with the assignment given, both individually and as a group.

Casas Malima (2019) confirms the positive correlation between the pedagogical leadership of María Parado de Bellido school's head-teacher and the teachers' performance. The stronger the pedagogical leadership, the better performance by the teachers.

Finally, Podestá (2014) mentions that collaborative work has the following characteristics:

- A strong interdependence bond between the group members.

- The motivation and desire to achieve a proposed objective, and the establishment of symmetrical and reciprocal bonds.

- Obligation and responsibility, both for individuals and groups, as a condition to achieve the objective.

- Diversity in relation to the particular qualities of the group members.

- The allocation of tasks to each member based on their knowledge, abilities, and possibilities.

- The effective use of communication skills.

CONCLUSIONS

The study confirmed the existence of a positive and highly significant development of dimension technical capability due to the implementation and performance of collaborative work. The evidence shown to sustain this assertion was compared to the control group and the experimental group, both in the initial and final tests, clearly showing the existence of a significant development in the experimental group.

In addition, the study concluded that there is a positive and highly significant development of dimension performance in the educational institution due to the implementation of collaborative work. The evidence shown to sustain this assertion was compared to the control group and the experimental group, both in the initial and final tests, clearly showing the existence of a significant development in the experimental group.

The results demonstrated the existence of a positive and highly significant development of dimension emotional management due to the performance of collaborative work. The evidence shown to sustain this assertion was compared to the control group and the experimental group, both in the initial and final tests, clearly showing the existence of a significant development in the experimental group.

The study confirmed the existence of a positive and highly significant development of dimension situational management due to the implementation and performance of collaborative work. The evidence shown to sustain this assertion was compared to the control group and the experimental group, both in the initial and final tests, clearly showing the existence of a significant development in the experimental group.

The study confirmed the existence of a positive and highly significant development of dimension problem solving due to the implementation of collaborative work. The evidence shown to sustain this assertion was compared to the control group and the experimental group, both in the initial and final tests, clearly showing the existence of a significant development in the experimental group.

Finally, the study concludes that there is a positive and highly significant development of leadership due to the implementation of collaborative work among the teaching staff of the Mathematics program at the School of Sciences who were part of the experimental group.

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Conflict of interest

The author has no conflicts of interest to declare.

Author contributions

Cyntia Victoria Ccahuancama Trujillo (lead author): research, methodology, validation, writing (original draft, review, and editing).