University Research Tutoring in A Formative and Preventive Environment

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Abstract

Graduating through a research work requires competencies in the student. For this reason, it is essential to study a research tutoring methodology from the tutor's training, resources and strategies that generate a positive, formative, and preventive work environment. The objective of this work focuses on the methodology that a research professor of high scientific productivity with Salesian style generates in the process of university tutoring in research, with visible results in the short term. The results show a total of 84 works completed between 2021 and 2023, an average of 28 works per year, as well as a participation of 29 female students and 59 male students. It is concluded that a research methodology accompanied by professors trained in a friendly spirit, proactive action, and immediate positive results, generates a positive environment where formative and preventive experiences permeate the conscience, the professional profile, and the life plan of the students.

Keywords: *Research, Mentoring, Organization of Research, Gentle Spirit, Salesian Style*

INTRODUCTION

In higher education, specifically in university institutions, the offer of a degree through research work requires competencies and characteristics in the student that lead to a methodology of scientific work and its writing (Elder et al., 2023; Llerena-Izquierdo & Ayala-Carabajo, 2022; Miller et al., 2023). The institution of higher education offers students the availability of a research professor as a tutor (Consejo de aseguramiento de la calidad de la educación superior (CACES), 2019). With this, the process of accompaniment in a bidirectional action always ensures that the commitments for the student are achieved motivated by the formative context generated by the institution (Menjívar Valencia et al., 2022). At the Universidad Politécnica Salesiana in Ecuador, in the last levels of study in each career, students plan an option for their degree (Universidad Politécnica Salesiana, 2014). Among those permitted by Ecuadorian legislation are the development of a technical project, the complex exam, case studies or the academic article, among others. Currently, in the city of Guayaquil, in the career of Computer Science, three degree option modalities are offered, among them, the academic article (Universidad Politécnica Salesiana, 2018).

The preparation of tutors for this task of accompaniment is supported by professors with fourth level studies who are part of the faculty of a career within the educational institution (Roberts et al., 2023). In addition, the tutors are part of a recognized instance in the university such as research groups (Universidad Politécnica Salesiana, 2023). A keen interest in the training of students in the formative process of research within the development of a university degree work requires the person called "tutor" with a capacity for research-teaching-administrative work according to the expectations of management and specific characteristics in the management of the process of accompaniment (Universidad Politécnica Salesiana, 2022). The role of the tutor is fundamental in the research training process (Ayala Carabajo, 2018; Cooper et al., 2023; Cutillas et al., 2023). It is the engine that moves the gears of planning, preventively, without taking away the student's protagonism within this process (Ayala Carabajo, 2018; Vergara Litardo, 2023). The tutor maintains evident and coherent positions as ideals marked in two aspects, from his professional life and from his professional mission, allowing him to create a more just society and to train those who make up that society, from his training, competencies and expertise (Ayala Carabajo, 2009; Cárdenas Tapia et al., 2023; Vandermaas-Peeler et al., 2023; Yuliawati et al., 2023). The tutor, because of his great interest, motivation and sympathy for any form of administrative organization, puts all his efforts in the protection and achievement of the processes aimed at the training of the

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participant (Hermans, 2021; Shukla et al., 2022; Universidad Politécnica Salesiana, 2017). Finding the most fruitful, achievable, and fair actions in a relationship of cordiality, affability, and interest in their development.

The training of the participants, under a structured, organized, planned and executed design determines the guideline of the professor's tutoring, establishing close links of continuous cooperation between the participant and the tutor, promoting the interest to continue, sustaining the commitment to advance and enhancing extrinsic motivation in a formative environment with a preventive approach (Ayala-Carabajo & Llerena-Izquierdo, 2023; Tan et al., 2022). The student in turn has the faculty to choose a professor as a tutor, among several available in the career, and in short and previous meetings with these professors he discovers in him, a quality that makes him decide, from the perspective of teleological ethics as a source of trust for the other. This quality externalizes the integrity of his heart to stimulate all work (Dai et al., 2022; Della Corte et al., 2022; Hermans, 2021; Johanson et al., 2022). With this the professor-tutor helps in the discernment of a research proposal (Ayala-Carabajo & Llerena-Izquierdo, 2023; Hermans, 2021) which, in many cases for the student, is unclear or non-existent.

Likewise, there is more and more evidence of work being carried out from a research proposal based on Don Bosco's preventive model than from the university (Menjívar Valencia et al., 2022) to the society (Aguilar Gordón et al., 2022; Llerena-Izquierdo & Ayala-Carabajo, 2021; Pizzigoni, 2021), carry the same transformative educational spirit (Aramburo, 2022; Hermans, 2021). Therefore, studying a research tutoring methodology for university students depends not only on resources and strategies, but also on the training or expertise of the tutor, which generates a positive, formative and preventive work environment to meet the expectations of the student and, from this experience, to enhance and strengthen the professional profile (Llerena-Izquierdo & Ayala-Carabajo, 2022).

The objective of this research work focuses on the methodology that a research professor of high scientific productivity with a Salesian style of formation generates within a process of university tutoring in research in a formative and preventive environment with visible results in the short term.

State of the Art

An inclusive culture prevails in a formative and preventive environment (Sanango Jimenes et al., 2021) that encourages respect, positive educational actions and tolerance (Mayancela Acero, 2016; Paucar Robles, 2020). Thus, in an institution of higher education, which has a formation provided by a religious congregation, specifically by the philosophy of the Salesian Society, it focuses its actions in conformity with the ideals of Don Bosco (Panach, 2012), by encouraging solidarity, friendliness, accessibility, hospitality and ethics (Cruz Frias, 2019; Pallo Ushiña, 2019). From such a pedagogy, like that of the holy educator, St. John Bosco, the construction of positive desirable bonds is born from the wisdom of the human heart that seeks the good of the other, that is, from an affective dimension that is integrated into the educational, formative and academic environment, a highly formative environment is generated from a space where trust generates affection and this strengthens the meaningful learning that leads to knowledge (Campo Aráuz, 2014).

From this perspective, educational management is closely linked to administrative management, which defines the actions of the members who work in the institution. They are the first ones called to create a formative and preventive environment, being the professors or administrators who keep a particularity as the action of the holy educator, which is to make decisions in diversity and equity, under a pedagogical model based on the Salesian style of action (Peraza, 2001). It is a responsible relationship that should generate those initiatives that should be imitated by all, and that if developed by the authorities generate a positive effect and emulated by the other members of the institution (Rangel Donoso, 2014).

The academic management units within the Salesian institution, as well as the degree program, play a fundamental role in ensuring that administrative management does not hinder the actions of the student in his or her objective of obtaining a degree (Llerena-Izquierdo & Ayala-Carabajo, 2021). With a clear itinerary to achieve the candidate's mission of professionalization, the participant finds a suitable scenario to develop his or her abilities and skills in a degree option that will allow him or her to achieve his or her mission (Martinez-Requejo et al., 2023). With this, the tutors, highly productive research professors, collaborate decisively in a

work scheme that overcomes any inconvenience (Llerena-Izquierdo & Ayala-Carabajo, 2022; Peraza Leal, 1986).

The tutor is the invaluable traveling companion in an academic, research and administrative training option, within an institution of higher education, is who dissipates any adverse situation that prevents the student from fainting in any difficulty during the chosen learning process, being the enthusiastic defender, optimistic and charismatic from the point of view of knowing how to guide with the heart (Coras Contreras, 2022; Pinzl, 2022; Sáenz Zavala, 2023). Their accompaniment becomes a force for action, confident, clear, assertive and decisive and that the tutor chooses to be so when he/she is chosen for an activity such as tutoring a student (Cárdenas-Tapia, 2022; Castro Ríos, 2022).

As Don Bosco indicates in his writings referring to Don Cafasso, his great benefactor who, since his studies at the Convitto (Peraza Leal, 1986, 1998)*, "He was that protector who, with the greatest encouragement, took care of the work of his apostolate with each one of those he directed",* (Peraza, 2012). Such a particular action will be the example to be followed by those professors who find themselves in a tutoring situation. Thus, the two-way experience, for the professor tutor to carry a great responsibility to fulfill the actions that allow the student to graduate and for the student himself, to feel all the support to develop as a future professional (Llerena-Izquierdo & Ayala-Carabajo, 2022).

For young students who choose an option to graduate, placing their trust in a tutor leads to being guided by the indications that, from a positive action, seeks to direct their actions and efforts towards the objectives set at the beginning of the administrative management. Thus, within an environment that forms, prevents, motivates and encourages, all significant achievements are reached, and in other cases even more, and much more when this coexistence, within this scenario, flows like a stream (Ayala Carabajo, 2009; Peraza, 1997).

Within a work proposal where the development of research skills must be implemented, from a formative management of the tutor and welcomed by the student, strategies emerge to find spaces that encourage the best performance of both (Bolton-King, 2022; Davis & Jones, 2017; House et al., 2018; Juris et al., 2022). With the characteristics of a formator, which should not be lacking when accompanying a young person from the heart with a Salesian style, and at the same time, it fosters the best attitudes in the student that should be assumed, in a co-responsible position, so that the accompaniment can be real, effective and truly useful (Aguilar Gordón et al., 2022; White-Lewis et al., 2022).

Finally, the achievement reached, a degree work stimulated by an external action such as the constant extrinsic motivation generated by the tutor (Lui & Andrade, 2022; Tay & Lam, 2022) allows not only to produce undiscovered skills and competencies in the young person (Llerena-Izquierdo & Ayala-Carabajo, 2022), but the finished product incorporates a set of expertise acquired by the authors, since in this work contributes with achievable solutions from the professional knowledge of the young researcher, who with impetus, dedication, effort and a lot of illusion contributes with specific results that minimize unfavorable situations in the context of the society in which he/she lives (Black & Wiliam, 2009; Hodgson et al., 2022).

MATERIALS AND METHODS

An analytical empirical research methodology of quantitative cut of longitudinal approach is developed. Students of the last two levels of studies in Computer Science in the city of Guayaquil of the Universidad Politécnica Salesiana de Guayaquil, from the year 2021 to 2023, to whom an ad hoc methodology for a research training proposal is communicated, presented, and socialized. The data are collected from the repository of degree works of the Universidad Politécnica Salesiana with DSpace technology[2].

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[2] Available at https://dspace.ups.edu.ec/simple-search?query=Joe+Llerena&location=%2F&rpp=10&sort_by=score&order=desc
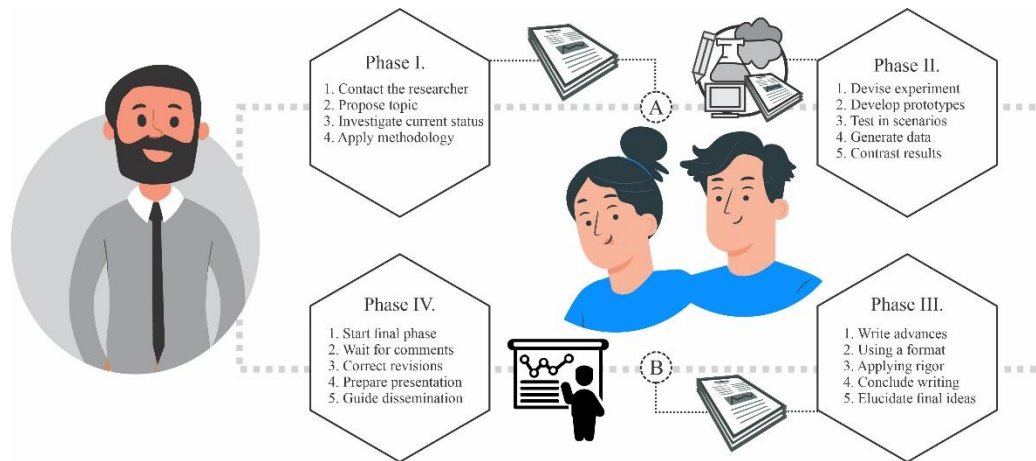
Figure 1. Methodology of ad hoc work proposed to students of the last years of study in the Computer Science program at the Universidad Politécnica Salesiana in the city of Guayaquil, Ecuador

In this research work, the methodological action to promote research skills are proposed by a member of the Research Group on Teaching-Learning of Sciences for Engineering, GIEACI and the Educational Innovation Group, Information and Communication Technologies in the teaching-learning process, Gie-Ticea, who from previous relevant work, has presented reliable results in the action of proposals in conjunction with undergraduate and graduate students[3]. Being an ad hoc methodology of accompaniment, it is adjusted to the context of the student who voluntarily chooses and accepts to follow without any pressure. It is the student who in previous meetings from the degree unit of the career decides by his own knowledge and reference of former colleagues, who have previously bet on the style of work of this professor[4], and that is executed in a process of four phases. These four phases of work, (see Fig. 1), each one of them, with essential, immediate, and two-way communication participation, is established between the professor and the participant.

In the first phase, the students contact the professor who belongs to a research group of the Universidad Politécnica Salesiana de Guayaquil. Thus, the first contact, whether in person or by electronic digital media, is a fundamental first moment, since the way of responding will make the participant feel in his or her words a desire to initiate a research proposal. From that moment on, the professor knows that he or she must begin his or her mission once again, and that he or she will fulfill it period by period. In that same answer, the professor's attitude changes to one of attentive, intuitive listening and searching for the knowledge or approach requested by the student. The professor must be able to present them with a path to follow in a research scenario. From the capabilities of those young people and from the experience of the teacher, they, the students, will be the new passengers of this unforgettable journey. Thus, by proposing a theme, this will be the starting point. From a motivation in their search until the young people themselves enthusiastically take ownership of the topic, this will make the next journey successful because they, by themselves, will set out on this search. The proposal includes learning to initiate the state of the art of the topic and to understand the research methodology of the professor, capable of developing new competencies that have not yet been discovered in the participant.

In the second phase, according to the context in which the student lives, works, and develops, the idea of conducting a quasi-experiment is born, so the participant can explore their own capabilities developed in a first prototype and test replicable and new scenarios based on what was discovered in the relevant literature review of the state of the art. With this, data generation is ready for collection, analysis, and tabulation. From a quantitative approach and using descriptive statistical techniques, results are obtained to be plotted and contrasted.

In the third phase, a format for rigorous research writing is chosen. The use of a format makes it possible to demand and demand discipline in analytical reading, precise and correct writing, as well as continuous revision

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[3] Available at https://gieaci.blog.ups.edu.ec/es/trabajos-publicados

[4] Available at http://joellerena.info/acompanamiento-academico/

of the same work. Applying rigor to the content will make the reviewers' revisions more enriching, faster and in many cases without the need for changes or improvements. Thus, the remaining time is left to elucidate final ideas that benefit the research.

In the fourth phase, it starts in a motivated way for the participant and for the professor, since, in this phase, the scientific writing has been finalized and sent to the degree unit for review by a tribunal of professors. With this, the suggested corrections, if any, are expected and the final ideas regarding the dissemination of the proposal are specified. In addition, together with the professor, the student prepares his/her presentation which has a set of actions, such as rehearsing, memorizing, remembering, and practicing the appropriate discourse of what was done in the proposal. It is also here where the tutor shines once again, so that the student has his own protagonism since it is he (student) who presents the disclosure from an orientation, clear, logical, structured and above all safe.

ANALYSIS AND RESULTS

The data collected from the DSpace repository of the Universidad Politécnica correspond to the total number of works developed and completed by students in the years 2021, 2022 and 2023 that have used the mentoring methodology in a formative and preventive environment. For the year 2021, the total number of completed works is 40 (see Fig. 2). For the year 2022 the total number of completed works is 17. For the year 2023 the total number of completed works is 27, a total of 84 works, including technical projects and academic articles, with an average of 28 works per year. It can be seen in the figure that for the year 2021 and 2022 there is a wide difference, this is due to the post-pandemic situation that has been experienced in the city of Guayaquil, Ecuador and that has caused a delay in the administrative management of the university, currently solved. The transition from confinement to presence has caused that, from each participant's and professor's perspective, the rhythm of work and methodology applied is normalized. By the year 2023, the totality of work is normalized, as evidenced by the average number of works obtained.
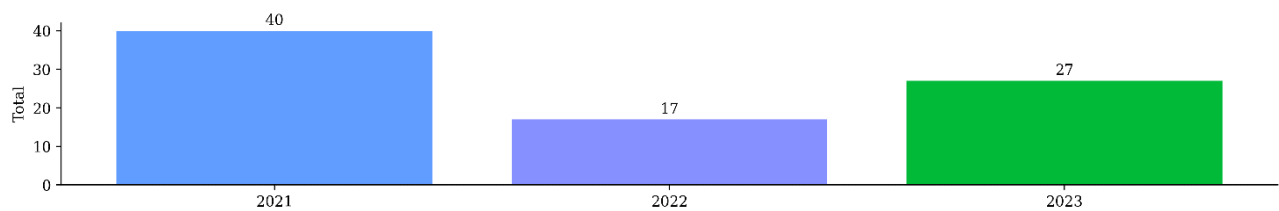

Figure 2. Total number of final projects, technical projects and academic articles hosted in the DSpace UPS repository

The data also collect the total number of works by type of degree option that, students when choosing in their last degree level, have voluntarily requested to choose the professor with the greatest effectiveness in the degree process of the career with the use of the research methodology that he proposes (Llerena-Izquierdo & Ayala-Carabajo, 2022). Of these, the total number of technical projects was 10 works. The total number of academic articles was 74. That is, 12% of the works were technical projects with the ad hoc research methodology proposed by the research professor and 88% of the works were academic articles (see Fig. 3).
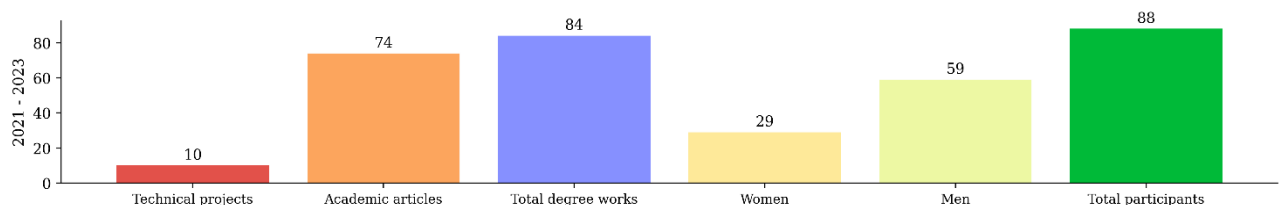

Figure 3. Total number of participants by gender and jobs by type from 2021 to 2023

It is also evident that the participation of male and female students corresponds to a total of 88, 29 females and 59 males in the three years indicated (2021 to 2023). Sixty-seven percent corresponds to male student participants and 33% corresponds to female student participants. Thus, the motivation to strengthen the

participation of students in the research field is noteworthy because young people become trainers of other young people.

DISCUSSION AND CONCLUSIONS

The research work involves a preparation time for both parties, tutor and tutored, and a set of skills that allow the development of a proposed work, provided that the planning, participation, and motivation of the participants is maintained in a timely manner, overcoming any unforeseen events, and avoiding delays in the products to be delivered. The effective work of a proposal is done in two directions, in the first one, the timely, accurate and quick response of the tutor in the answer and solution to situations that may generate any delay. And the second corresponds to the collaborative work of the student that does not allow its own delay. With this, the effectiveness of the process flows in achieving the expected results and objectives.

A highly productive coach will not allow planning to slow down or stop and will collaborate in preventive actions to avoid a pause in the continuous work achieved. A participant with a high extrinsic motivation allows the tutor to listen to the message and, when reflecting on some decision making, to put a higher purpose to the next obstacle. For a Salesian institution, the proposals of teachers in many participations together with their students generally overcome difficulties and achieve highly desirable common goals. With this, the motivated spirit achieves what was planned, overcoming those obstacles that in any proposal must be overcome.

In such an environment, where there are strong incentives to conclude and preventive actions to avoid discouragement, university research tutoring, guided by tutoring professors, convinced of what their students can achieve, allows creating a formative and preventive environment of high research results.

It is concluded that a methodology in research accompanied by professor-tutors trained from a friendly spirit, of proactive action and of achieving immediate positive results, generates a friendly environment in the university educational institution where students find formative and preventive experiences that permeate their conscience, professional profile, and their life plan.

The training of the professor-tutors is indispensable for the accompaniment in research tutoring, from a proper, timely, diligent, and objective follow-up style, so that the tutor's actions become effective and at the same time convenient for the student to be able to move towards a desired final process of tutoring.

Acknowledgements

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