Planning for the Future: How ICT Professors Approach Retirement and Post-Career Life

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Abstract

Context: Professors' attitudes toward retirement vary widely, ranging from enthusiasm to reluctance. The retirement process of university professors in the field of Information and Communication Technology (ICT) presents a critical characteristic: ICT educators often work at the cutting edge of innovation, which may instill a strong drive to remain professionally engaged even after reaching traditional retirement age. **Problem**: The research problem focuses on understanding the factors that impact the retirement process of ICT professors in higher education. **Solution**: This study aims to investigate the human, organizational, legal, and regulatory factors that may affect the retirement process of ICT professors. **IS Theory**: This research is based on Contingency Theory, which emphasizes the need for organizations to adapt their practices to specific environmental conditions. **Method**: We conducted a survey with 176 ICT professors from various universities across the country to gather data on their perceptions and preparations for retirement. **Summary of Results**: Our findings reveal that most professors begin to consider retirement early (31.3%) or mid-career (21.6%). Over 64% plan to engage in leisure activities and travel after retirement, while continuing to contribute to academic research. Financial reserves and post-career activity planning are key aspects of this process. However, most universities do not offer training courses to prepare them for retirement. **Contributions and Impact in IS**: This study contributes to the Information Systems (IS) field by applying Contingency Theory to the development of guidelines that address the complex retirement process for ICT professors. This research also opens avenues for further studies on how IS frameworks can be applied to address transitions in professional life cycles, particularly in knowledge-driven fields like academia.

CCS Concepts

• **Social and professional topics** → **Professional topics**; *Computing profession*; Employment issues.

Keywords

Retirement, ICT Professors, Post-Career Life

1 Introduction

Retirement is an inevitable milestone in every worker's life, which can be perceived both as a liberation and as a moment of withdrawal. This phase evokes various emotions, especially uncertainties related to distancing from the work environment [5, 26]. The teaching profession involves not only intellectual knowledge, but also the maturity that comes from years of experience in teaching, research, and extension. The fullness achieved in intellectual and theoretical production throughout a career makes the break with the academic world especially challenging. Retirement can generate feelings of exclusion, loss of identity, and value, making this process painful for many professors [6, 15, 16].

The retirement process of university professors in Information and Communication Technology (ICT) presents a unique and critical subject of investigation. Unlike professors in many other academic disciplines, those in ICT face rapid technological evolution, continuous professional development requirements, and the constant need to remain up-to-date with new tools, methodologies, and trends [18]. This continuous need for re-skilling creates distinct challenges and opportunities for ICT professors when it comes to preparing for and transitioning into retirement. Moreover, ICT educators often work at the cutting edge of innovation, which may instill a strong drive to remain professionally engaged even after reaching the traditional retirement age. The dynamic nature of their careers, combined with the high demand for expertise in technology-driven fields, can lead to the prolongation of professional activity post-retirement. This introduces questions about what motivates these professionals to continue working, how they plan their financial futures, and how well universities support them during this transition.

Although the scientific literature addresses the issue of retirement, studies are still limited and tend to focus on professors' frustrations and feelings in general, [28], not on Information and Communication Technology (ICT) particularly. Studying the retirement process of ICT professors is not only important from a personal or financial perspective, but it also sheds light on institutional practices and support systems. Understanding these factors helps universities develop better policies to aid their faculty through the retirement process, potentially leading to improved well-being and professional satisfaction.

The ICT field faces many challenges and the constant need for knowledge updates might lead to a brain drain of Brazilian researchers to other countries, especially in Computer Science[1], or

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[1]https://github.com/adolfont/brazilian-cs-research/blob/master/brazilian-cs-researchers-working-abroad.md

even a shift from academia to industry, seeking better salaries and working conditions.

To explore the retirement process of ICT professors in higher education, this study employs a mixed-method approach, combining qualitative and quantitative data collection through a structured survey. The survey was designed to address the personal, organizational, legal, and regulatory aspects of retirement that specifically impact ICT professors. By focusing on this target group, the study aims to answer key research questions regarding their preparation for retirement, their motivations for continuing to work beyond retirement age, and the institutional support provided to them during this transition.

The survey was distributed to professors from various public and private universities in Brazil and gathered information on their retirement planning, financial strategies, and psychological preparedness. Additionally, the study explores whether these professors have participated in institutional programs aimed at preparing them for retirement and what additional resources or support they believe are necessary. As a result, we found that i) professors plan to intensify their social relationships with family and friends after retirement; ii) most of them intend to continue contributing to research and/or as a collaborator professor after retirement; and iii) more than 94% of professors have never participated in a training course to support their retirement process, which demonstrates a lack of concern on the part of universities in preparing professors for this stage of their careers.

The contributions of this paper are threefold. First, it provides empirical evidence on how ICT professors in higher education prepare for and experience the retirement process, highlighting the unique challenges they face compared to other academic fields. Second, it identifies key motivators that lead ICT professors to extend their professional activities post-retirement, offering insights into the personal and professional drivers behind their decisions. Lastly, the study offers recommendations for higher education institutions to improve their retirement support systems, ensuring that faculty members receive the necessary guidance and resources to navigate this life transition smoothly. These contributions not only enhance our understanding of the retirement process in the context of ICT but also offer practical implications for policy and practice within academic institutions.

2 Background and Related Work

Retirement is seen as an ongoing process, rather than an isolated event. The paths to retirement are evolving, and the experiences of retiring professors have gained increasing relevance, especially with the aging academic workforce in Higher Education Institutions (HEIs) around the world. In this section, we present some studies that investigate the effects of university professors' retirement. Cahill et al. [6] conducted semi-structured interviews with eleven retired women professors, aged 64 to 73, from a university-level college of education and liberal arts in the Republic of Ireland. The study aimed to explore how retirement affected their daily lives, as well as their personal and professional relationships. The authors identified four main themes: (i) the impact of retirement on identity, (ii) the freedom provided by retirement, (iii) the pursuit of health and well-being, and (iv) the importance of maintaining professional

relationships during retirement. Most of the interviewees continued to engage in paid or unpaid activities, considering this important for their lives and identity after retirement. Professors who held senior positions, with a strong research background, expressed dissatisfaction with mandatory retirement but managed to maintain their research activities after retirement. Conversely, those with less involvement in research tended to retire earlier and reported that stress and fatigue affected their health.

Crow [8] examined varying levels of enthusiasm among professors post-retirement. While some viewed retirement as a fresh start, others continued or intensified their academic involvement. The study found that many professors wished to retain academic ties, whether through paid or voluntary work, though institutional support varied. Participants expressed that ideal retirement includes intellectual engagement with less bureaucratic involvement, fostering a balance between work, family, and hobbies. Most continued unpaid academic activities with access to resources like libraries (94%), email (89%), and computing (65%), though only 38% had shared office space. Additionally, 53% felt welcomed by former colleagues, while 24% reported feeling excluded or "invisible." Participants suggested that associations for retired professors could help alleviate these feelings, though availability and success of such support depended on retirees' own involvement.

Davidovitch and Eckhaus [10] investigated how professors perceive the possibility of continuing to work in research and teaching after retirement age. The authors conducted a survey with 108 senior professors from Ariel University in Israel. The results showed that while some professors support retirement age restrictions, they acknowledge the value of professors' experience and support their continuation in research, mentoring, and, to some extent, teaching after retirement, as long as it does not hinder the hiring of new professors.

Amani and Fussy [2] analyzed the perspectives of retired professors on retirement planning mistakes that affect post-retirement adjustment and well-being. The findings indicated systemic and behavioral failures that hinder the transition from work to retirement, such as low savings and debt accumulation, limited access to retirement education, late family establishment, inadequate record management, and neglect of career development opportunities. The authors concluded that these mistakes have substantial, irreversible costs that impact retirees' time, health, and psychological well-being. Additionally, the study recommended that the government pay benefits on time, in accordance with the law, and suggested implementing mandatory retirement planning education, including seminars and workshops, as part of career development policies and public service and social security laws.

Shlomo and Oplatka [24] investigated the retirement adaptation process among professors by conducting interviews with 30 retired professors between two and six years into retirement. The results showed that professors' professional identity influences both psychological adjustment and practical aspects of post-retirement life. Personality traits and skills developed over 30 years of teaching continue to guide professors in retirement, impacting their daily activities. For many, teaching still "runs in their veins" even after retirement. The study recommends that authorities and professor organizations facilitate interaction between retired professors, who wish to contribute their experience, and new professors who need

guidance. It also suggests participation in pre-retirement seminars to explore ways to utilize teaching skills, promoting mental and economic well-being in retirement.

The retirement paths of professors in higher education institutions are diverse and have important implications for the academic profession, as well as for universities' human resources departments, and for the professors themselves, who, according to literature reports, do not cope well with post-retirement. To the best of our knowledge, no study to date has specifically investigated the factors that influence the retirement process of ICT professors in Higher Education Institutions.

3 Study Settings

This study aims to investigate the human, organizational, legal, and regulatory factors that may influence the retirement process of ICT professors. In doing so, we seek to understand how retirement affects these professors, both in terms of personal and financial aspects. To achieve this objective, we have established the following research questions (RQs):

RQ.1 How are ICT professors in Higher Education Institutions preparing for retirement?
This research question investigates how professors are prepared for retirement, focusing on financial aspects and establishing support networks.

RQ.2 What motivates ICT professors to continue working after retirement?
The objective is to explore the factors that encourage professors to remain professionally active after retirement.

RQ.3 How do Higher Education Institutions Prepare Their ICT Professors for Retirement?
This question investigates whether higher education institutions provide training, resources, or support programs aimed at preparing professors for retirement.

To answer the research questions, we conducted a survey with various higher education professors. The following sections detail the target audience, the survey design, the pilot study, the invitation and distribution of the survey, and the strategies we employed to analyze the collected data.

The target audience for this study consists of ICT professors who work in higher education institutions, both public and private. Focusing specifically on ICT professors is important because this field, with its rapid technological evolution, presents unique characteristics that may influence the retirement process. These include the ongoing need for professional development due to technological advances and the challenges associated with prolonging a career in a highly dynamic environment. To ensure that the research was limited to ICT professors, we implemented some measures. The invitation to participants and the initial instructions of the questionnaire explicitly stated our target audience. We also strategically distributed the questionnaire via the email addresses of professors listed on the institutional websites of various Brazilian universities offering courses such as Computer Science, Bachelor's in Computer Education, Information Systems, Communication Network Engineering, Communication Networks, Software Engineering, and Computer Engineering. Additionally, we sent direct messages to these professors' profiles on social media and used WhatsApp when

their phone numbers were available. We also requested that they share the survey with their course colleagues. We included a screening question at the beginning of the survey to filter out participants who did not meet the established criteria. Finally, the survey questions were carefully designed with direct references to our target group.

All authors of this study actively participated in the development and validation of the survey questions. The survey consisted of 27 questions, including 21 multiple-choice and 6 open-ended questions, as Table 1 shows. Additionally, we included a Consent to Participate in Research section that detailed the conditions, terms, and contact information, ensuring both anonymity and the appropriateness of the desired profile (ICT professors). All questions and response options, along with the complete material for this study, are available on Zenodo at https://zenodo.org/records/13948508.

We used the Google Forms platform to create the questionnaire. The survey was available from September 12 to October 16, 2024 (35 days). Although participation was optional, respondents were encouraged to participate through email invitations. We conducted a pilot test to evaluate the quality of the questionnaire. We sent the form to five ICT professors from public higher education institutions. They suggested adjustments in the phrasing of some questions, the removal of repetitive questions, modifications to time intervals, and the inclusion or alteration of some response options. Based on their suggestions, we refined the questionnaire. The pilot participants took about 10 minutes to complete it, and this duration was communicated when the survey was made available to the public. The responses from the pilot were not included in the data analysis.

3.1 Data Analysis

This study adopts a mixed-methods approach, integrating quantitative and qualitative research techniques. We used percentages and graphs to characterize the sample and classify the most cited items by participants. In addition, we applied correlation analysis to investigate the relationships between specific variables. Furthermore, for the open-ended questions in the survey, we employed open and axial coding, following the principles of Grounded Theory [7]. Grounded Theory refers to an inductive method of generating theory from data. Studies typically include unstructured text, such as interview transcripts, field notes, and so on. However, they can also include structured text, diagrams, images, and even quantitative data [7].

The coding process was conducted in three stages. In the first stage, two authors performed open coding of the open-ended questions, segmenting the data into discrete parts and creating labels for the codes. In the second stage, these same authors conducted axial coding, reviewing the discrete parts and assigning the created codes to these segments. In the third stage, categorization and refinement of the codes took place. Figure 1 illustrates the coding procedure. The example shows how we coded the response from a specific respondent (#R15) to question Q21 in Table 1. It is important to note that each response can be associated with multiple categories during the coding process. In the example described in Figure 1, three quotes were extracted from the respondent's speech, each linked to a corresponding code (1, 2, and 3 in Figure 1). These codes

Table 1: Survey's Questions

ID	Questions	RQ
Q1	Which institution are you currently employed at?	RQ.1
Q2	The institution where you teach is?	RQ.1
Q3	In which state is your educational institution located?	RQ.1
Q4	What is your age?	RQ.1
Q5	What is your marital or relationship status?	RQ.1
Q6	What is your educational level?	RQ.1
Q7	How many years of experience do you have working in higher education institutions?	RQ.1
Q8	In how many years do you plan to retire?	RQ.1
Q9	At what point in your career did you start thinking about retirement?	RQ.1
Q10	What is your gross monthly income?	RQ.1
Q11	How many dependents do you have?	RQ.1
Q12	How do you plan to fill the free time that is currently dedicated to work after you retire?	RQ.1
Q13	If you wish to continue contributing academically or in the ICT field after retirement, in what ways would that contribution take shape?	RQ.1
Q14	With retirement, certain benefits such as meal allowances, health plan reimbursements, and additional compensation, among others, are lost. How are you preparing for this significant loss of income?	RQ.1
Q15	If you plan to continue working after retirement, what would be your main motivation?	RQ.2
Q16	With the COVID pandemic, people spent more time at home, leading to a lack of social interaction and a rise in severe cases of depression. This lack of social connection can also be observed in retirement due to the absence of a support network, which can cause depression in many retirees. How do you plan to prepare your support network for the retirement phase (friends, family, etc.)?	RQ.2
Q17	Do you feel psychologically prepared to leave the work environment and retire?	RQ.1
Q18	If you do not feel prepared, could you share some of your main emotional concerns regarding retirement?	RQ.1
Q19	Did you enter the public service after Law 12.618/2012, dated February 4, 2013?	RQ.1
Q20	Have you enrolled in Funpresp or another complementary pension plan?	RQ.1
Q21	If you have enrolled, why do you believe that a complementary pension plan is worthwhile?	RQ.1
Q22	Have you participated in any training programs preparing for retirement?	RQ.3
Q23	If you have participated in any retirement preparation training, could you specify which one it was and what benefits you identified?	RQ.3
Q24	What types of resources or support programs for retirement do you consider important and that are not yet available at your institution?	RQ.3
Q25	Do you live in a functional apartment?	RQ.1
Q26	Where do you plan to live after retirement?	RQ.1
Q27	If you have any suggestions or additional information you would like to share with us, please use this space.	RQ.3

served as the basis for creating three categories (C1, C2, and C3) and their respective subcategories (C1.1, C2.1, and C3.1). Thus, the identified codes were transformed into categories or subcategories, depending on the case.
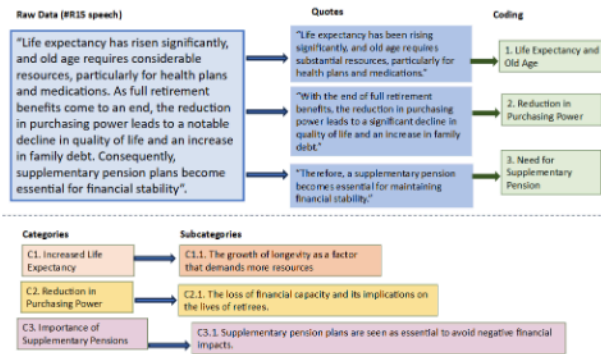

Figure 1: Coding process

The codebook for this study compiles data from all the open-ended survey questions, along with their respective coding processes, which are fully accessible online at Zenodo. The coding process includes respondents' comments, the quotes that gave rise to the categories, as well as the categories and subcategories created from the data.

4 Results

This section presents the survey results conducted to answer the research questions described in Section 3. First, we provide an overview of the participants' profiles, followed by the presentation of the results, organized according to the research questions mentioned in Section 3.

Table 2 provides an overview of the profiles of the 176 survey participants (Q2 to Q8, and Q10 from Table 1). Out of the 26 Brazilian states plus the Federal District, only Amapá had no representatives in the survey. On the other hand, the Federal District and the states of Goiás and Paraná had the highest representation, with 22.7% and 6.8% of the participants, respectively. Consequently, the majority of respondents were from the University of Brasília (UnB), the Federal University of Paraná (UFPR), and the Federal University of Goiás (UFG) (Q1). We also investigated at what point in their careers professors began considering retirement (Q9). 31.3% stated that they thought about it from the beginning of their careers, 21.6% when they were midway through their careers, 13.1% as they approached the minimum retirement age, 27.3% indicated that they have not started planning for retirement, and 6.8% of participants stated that they do not intend to retire. 36.4% of the professors who participated in the survey have two children (Q11), 28.4% have one child, and 26.7% do not have any children. 7.4% have three children, and only 1.1% of the professors reported having four or more children.

4.1 RQ1. Preparation for retirement

Our study reveals a range of plans that professors have for their post-retirement lives. A majority (64.8%) intend to use the time currently dedicated to work for leisure activities and travel (Q12). Additionally, 42% plan to support their families, including spending time with children and grandchildren. In terms of post-retirement employment, 36.4% of professors expressed a desire to continue

Region	#	%
North	20	11.2
Northeast	43	24.4
Southeast	21	11.9
Midwest	66	37.5
South	26	15
Type of Institution	**#**	**%**
Federal Public University	155	88.1
State Public University	17	9.7
Private University	4	2.2
Age group	**#**	**%**
31 to 36 years old	17	9.7
37 to 42 years old	45	26
43 to 47 years old	33	18.8
48 to 54 years old	41	23.3
55 to 60 years old	26	14.8
61 to 65 years old	7	4
66 to 70 years old	7	4
Relationship Status	**#**	**%**
Committed	25	14.2
Single	16	9.1
Married	120	68.2
separated	3	1.7
Divorced	12	6.8
Educational Level	**#**	**%**
Graduated or Master student	3	1.6
Master	7	4
PhD student	11	6.3
PhD	155	88.1
Experience	**#**	**%**
Between 1 and 3 years	4	2.3
Between 4 and 6 years	15	8.5
Between 7 and 9 years	14	8
Between 10 and 12 years	12	6.8
Between 13 and 15 years	27	15.3
Between 15 and 20 years	37	21
Between 21 and 25 years	45	25.6
Between 26 and 29 years	7	4
More than 30 years	15	8.5
Retirement forecast	**#**	**%**
Between 1 and 5 years	9	6.3
Between 4 and 6 years	16	9.1
Between 7 and 9 years	10	5.7
Between 10 and 12 years	15	8.5
Between 13 and 15 years	17	9.7
Between 15 and 20 years	33	18.8
Between 21 and 25 years	45	25.5
Between 26 and 29 years	13	7.3
More than 30 years	16	9.1
Monthly income	**#**	**%**
Between 5.1K and 8K	3	1.7
Between 8.1K and 12K	22	12.5
Between 12.1K and 16K	37	21
Between 16.1K and 20K	55	31.3
Between 20.1K and 24K	40	22.7
More than 24K	19	10.8

Table 2: Demographics of the survey respondents (n= 176).

in paid work related to their current careers, while 11.4% aim to pursue paid work in new fields. Furthermore, 25.6% plan to engage in volunteer work, and 19.3% have not yet made specific plans for their retirement activities, as shown in Figure 2.
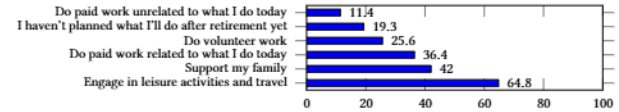

Figure 2: Planning to fill free time after retirement

Regarding continued academic engagement, over half of the professors (54%) wish to contribute by conducting research post-retirement (Q13). Consulting is another popular choice, with 47.2% planning to engage in this work. Additionally, 30.7% intend to continue as adjunct professors, 23.3% as visiting professors, and 14.8% plan to offer mentoring. Only 15.6% of the professors indicated that they do not intend to work in any capacity after retirement, as shown in Figure 3.
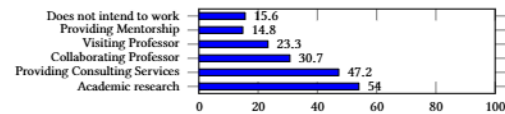

Figure 3: Ways to continue contributing academically

These findings align with the study by Cahill et al. [6], which shows that many professors view retirement as an opportunity to extend their professional contributions, often maintaining involvement in the academic roles they developed during their careers. The authors also observed that only a minority of professors approach retirement as a complete break from academic life. Supporting this perspective, Rowson and Christopher [22] found that professors often view their work as a lifelong vocation or legacy, driven by a commitment to teaching and research. Participants in Rowson and Christopher's study frequently described a strong attachment to the institutions they helped shape, with many seeing continued engagement as a means of advancing their mission of education and scholarship.

When a professor retires, they lose certain indemnity benefits, such as meal allowances, health plan reimbursements, and amounts related to their gratified position, among others. Therefore, we asked how professors are preparing for this significant loss of income (Q14). 58% stated that they are saving financially during their active years to supplement their income and maintain their standard of living after retirement. 26.7% have not yet planned what they will do, 17.6% indicated that they will reduce their standard of living, and 13.6% stated that they intend to supplement their income by returning to the workforce after retirement, as shown in Figure 4.

63.6% of professors surveyed reported feeling psychologically prepared to retire and leave the work environment (Q17), while 36.4% indicated they were not ready for this transition. This finding is consistent with Lai et al. [14], which found in their study of
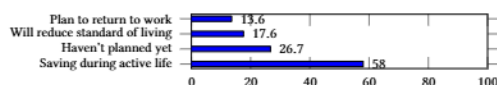
Figure 4: Preparation for Income Reduction in Retirement

458 professors from 16 Malaysian universities that most professors hold positive attitudes toward retirement. To better understand the concerns of those who did not feel prepared, we asked participants to share their primary emotional reservations regarding retirement (Q18). Responses were categorized into 14 distinct themes, with the most common being Calmness (65 mentions), Financial Concerns (22 mentions), and Carefreeness, where 15 participants expressed a lack of concern about retirement issues. Table 3 details all identified categories and subcategories from the coding of Q18 responses. The complete codebook for the open-ended questions is available on Zenodo at https://doi.org/10.5281/zenodo.13948508.

When examining participants' enrollment in public service, we found that 35.2% joined prior to the enactment of Law 12,618/2012 on February 4, 2013 (Q19), while 64.8% joined afterward. In terms of retirement financial planning, 59.7% of professors reported that they had not enrolled in Funpresp or any other complementary pension plan (Q20), whereas 40.3% had. Among those who opted for a complementary pension plan (Q21), the primary motivations were to establish an investment fund for retirement (24 professors) and to access plan benefits (15 professors), such as government contributions and having alternative income sources. Table 4 presents further details on these findings.

Housing arrangements were also explored. A significant majority (93.8%) of professors indicated that they do not live in university-provided apartments (Q25). Of the 6.3% who do reside in such accommodations, many reported plans to save for a personal home upon retirement. In addition, 84.1% of professors already own a home (Q26), with the remaining respondents planning to live in rental properties or with family members.

> **RQ.1 Summary**: Most ICT professors plan to spend their retirement engaged in leisure activities and travel, while many are also focused on saving to ensure a stable post-retirement income. Although some feel well-prepared for retirement, others express financial concerns and anticipate potential challenges such as loneliness in this new stage of life.

4.2 RQ2. Motivations to work after retirement

To address RQ.2, we investigated whether professors intend to continue working after retirement and their primary motivation for doing so (Q15). A total of 43.8% of professors indicated that they plan to continue working after retirement due to a combination of financial, social, and personal fulfillment factors. Among them, 26.7% cited personal fulfillment as their main motivation, such as the satisfaction of continuing to work and contributing to the academic community. Another 15.9% indicated social motivations, such as staying active and socially connected, while 14.2% pointed to financial motivations, specifically the need to supplement their

retirement income. However, 25% stated that they do not intend to continue working after retirement. Figure 5 shows a summary of these results.
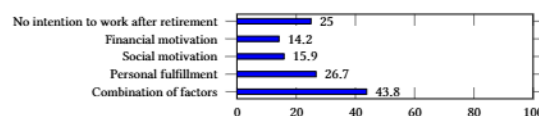

Figure 5: Primary motivation for continuing to work after retirement

During the COVID-19 pandemic, prolonged time spent at home and limited social interaction contributed to a rise in severe depression cases [11]. A similar effect can occur during retirement, where the lack of a support network can lead to depression among retirees [21]. Aging itself presents significant challenges, requiring individuals to navigate life changes with resilience, adaptability, and coping skills. Research indicates that retirement, in particular, can contribute to depressive symptoms due to its drastic lifestyle changes [9, 20]. To explore how retirees plan to counter these potential challenges, we asked participants about their strategies for building a support network in retirement (Q16). We identified 10 categories, with the largest being *Social Relationships*, which also had the most subcategories. Most participants (88) indicated they intend to maintain strong social connections with family and friends. The second most common category was *Planning*, where 58 participants reported that they had not yet considered building a support network, while only 3 specifically mentioned intentions to stay connected to a support network. Table 5 provides details on all identified categories, subcategories, and their respective mention counts by participants.

Amorim and de Freitas Pinho França [3] proposed a model based on the relationship between pre-retirement planning and satisfaction in retirement, mediated by individual resources of a physical, social, emotional, cognitive, and motivational nature. They conducted a survey with 1,194 retirees aged 44 to 88 from all regions of Brazil, focusing on retirement satisfaction, individual resources, retirement planning, and sociodemographic characteristics. The results emphasize the importance of retirement planning focusing on the development of individual resources essential for well-being, particularly those related to health, finances, and relationships. The authors concluded that for Brazilian retirees, planning contributes to the establishment of a social support network (family and friends), which becomes an important part of the retirement satisfaction process. Thus, our findings are similar to those of Amorim and de Freitas Pinho França [3], as social relationships, such as maintaining connections with family and friends, were the most frequently cited categories in our research, followed by the planning of a support network to achieve a better retirement.

> **RQ.2 Summary**: Most professors intend to continue working after retirement, motivated by financial, social, and personal fulfillment factors, as well as a desire to strengthen their support network by deepening ties with family and friends.

Category	Subcategory	#
1. Calmness	Prepared for Retirement	63
	Continue Engaging in Academic Activities	2
2. Financial Concerns	Financial Concerns	14
	Financial Concerns versus Emotional Concerns	2
	Financial Concerns and Loss of Purpose	1
	Financial Concerns and Productive Activity	1
	Financial and Social Concerns	1
	Social and Emotional Concerns	3
3. Carefreeness	Lack of Concern about Retirement	15
4. Idleness	Feeling of Idleness	10
5. Loneliness	Loneliness	8
	Lack of Purpose and Social Isolation	1
6.Concerns	Lack of Social Engagement	5
	Social Concerns and Mental Health	1
	Development of Personal Projects	1
	Job Satisfaction	1
	Attachment to the Profession and Continuity in Work	1
7. Personal Time Management	Optimization of Free Time	4
	Optimization of Free Time and Autonomy	1
	Difficulty in Dealing with Lack of Occupation	1
	Optimization of Free Time and Health Concerns	1
8. Challenges	Changes and Challenges in the Career	1
	Fear of Change	1
	Fear and Emotional Concerns	1
	Challenges of Career Transition	1
9. Uncertainty	Uncertainty and Lack of Planning	3
10. Health	Emotional Preparation and Psychological Support	1
	Health Concerns in Retirement	1
	Fear of Depression and Loss of Purpose	1
11. Personal Fulfillment	Personal Fulfillment	2
12. Financial Risk	Financial Uncertainty and Impact on Quality of Life	1
	Financial Planning and Routine Organization	1
13. Personal and Professional Satisfaction	Educational Activity and Social Interaction	1
14. Family Well-Being	Security and Stability of Dependents	1

Table 3: Emotional Concerns Regarding Retirement

Category	Subcategory	#
1. Income	Retirement Investment Fund	24
2. Benefits	Government Contribution	13
	It is important to have alternatives to public retirement	2
3. Increased Life Expectancy	The growth of longevity as a factor that requires more resources	1
4.Reduction of Purchasing Power	The loss of financial capacity and its implications for the lives of retirees	1
5. Importance of Supplemental Retirement Plans	Supplemental retirement plans being seen as essential to avoid negative financial impacts	1

Table 4: Reasons for Joining Supplemental Retirement Plans

4.3   RQ3. Preparation for retirement

Most professors (94. 9%) have never participated in training or preparatory courses for retirement (Q22). Only 5.1% indicated they had attended some form of retirement-related training. This finding aligns with Fonseca [13], who investigated the actions promoted by the Federal Public Universities in Brazil to assist employees in preparing for retirement. The authors conducted a documentary analysis of 61 Institutional Development Plans (PDI) and administered a questionnaire to 38 universities. The results showed that most institutions do not include retirement preparation initiatives as part of their internal social responsibility practices. Training programs not only strengthen workplace relationships but also reflect a commitment to responsible social practices.

We asked professors who had participated in preparatory training for retirement about the benefits they identified (Q23). Of the 8 professors who attended a course, #R13 and #R93 stated that:

> "The benefit was learning about the estimated time for retirement and how to prepare for life as a retiree."

> "The benefit was learning how to improve my financial planning for post-retirement life."

We also asked survey participants what types of retirement resources or support programs they consider important but are not yet available at their institutions (Q24). Thirty-five participants mentioned retirement training courses (Training Category), and thirteen mentioned support groups (Support Groups Category), for both psychological support and social activities.

Some participants provided suggestions (Q27), such as#R7 and #R33, respectively:

> "It is important to consider issues related to relocating. I believe that many professors today plan not to live where they work after retirement. This decision can have considerable impacts on retirement planning."

Category	Subcategory	#
1. Social Relations	Travel	3
	Maintain social relationships	1
	Family	16
	Friends	17
	Social activities; Family and active religious life	1
	Talk about the new routine	1
	Empower friends and acquaintances	1
	Family and Travel	1
	Stay in touch with people from various social niches	1
	Family; Friends; and Social events	1
	Family and Friends	25
	Financial investment; Travel; and Family	1
	Family and Social activities	1
	Friends and Social activities	3
	Physical activity groups and Travel	1
	I already have a support network	3
	Social activities	5
	Maintain social interaction	1
	Stay alone	1
	Travel; Family; Friends; and Social activities	1
	Family; Friends; Social activities; Physical activities; and Travel	1
	Family; Friends; and Social activities	1
	Family; Friends; Social activities; Financial investment; Volunteer work; and Maintaining mental and physical health	1
2. Planning	haven't thought about a support network	58
	Stay in touch with the support network	3
3. Work	Paid work	6
	Volunteer work	4
4. Social relationships and Work	Family; Friends; and Paid work	1
	Family; Volunteer work; Travel; and Friends.	1
	Friends and Volunteer work	2
	Paid work; Physical activity; and Friends	1
	Paid work; Social events; and Friends	1
5.Financial	Financial investment	3
6. Personal	Form a music band	1
	Study	2
7. Research	Associate with a graduate program	1
	Work as a collaborator professor/researcher	1
8.Social Dependency	Not being dependent on a support network	1
9. Housing	Live on the Coast	1
10. Health	Have therapy	1

Table 5: Preparation of the Support Network for Retirement

"Educational institutions should prepare their professors for this stage of life, as the process of generating knowledge and educating students will certainly decrease, which can impact professors psychologically."

5 Discussion

Retirement planning throughout one's career. A significant number of professors (31.3%) began to think about retirement early in their careers, suggesting a certain level of awareness regarding the need for planning for post-retirement life. However, it is concerning that over 27.2% of participants have not yet started planning for this stage of their lives. Additionally, some professors stated that they do not intend to retire. This may reflect factors such as intense dedication to their academic careers or a lack of clarity about what retirement might mean in terms of quality of life and well-being. Atchley and Cottrell [4] also investigated how the interaction between financial education and clarity of retirement goals, future time perspective, attitude toward retirement, risk tolerance, and social group support as psychological characteristics influence retirement planning behavior. The results revealed that future time perspective, clarity of retirement goals, and social group support have a significantly positive effect on retirement planning behavior.

Filling free time in retirement. Most professors (64.8%) plan to use their free time for leisure activities and travel, reflecting a need for rest and recreation. However, a significant portion of professors intends to continue working, either in paid activities related to their field or by engaging in volunteer work. This finding reinforces the idea that retirement is not seen as an end, but rather as a transition to a new phase where work, in some form, is still present. This desire to continue contributing aligns with the results from Q13, where 54% of professors express the intention to continue conducting research, highlighting their strong connection to academic life. The individual's motivations to engage in leisure activities during the time gained after retirement may depend on their views of their future selves (i.e., perceptions of their own aging) as well as their levels of preparation for age-related changes. de Paula Couto et al. [12] examined the longitudinal changes in levels of engagement in leisure activities that occur around the age of retirement, influenced by views on aging and preparation for old age. Their sample consisted of 451 individuals, who were divided into three age-matched groups: recently retired (between baseline and follow-up), already retired (at baseline), and individuals still working (at follow-up). The findings indicated that changes in leisure engagement levels varied between groups. Recently retired participants showed an

increase in their levels of engagement in leisure activities compared to both the already-retired and still-working participants.

Financial concerns and their impact on quality of life. The loss of financial benefits upon retirement is a significant concern among professors. The majority indicated that they are saving money during their active careers to maintain their standard of living. This financial preparation reflects a pragmatic awareness of potential income reduction and its impacts. However, professors who have not yet planned for their post-retirement activities may be at risk of facing financial difficulties in the future, highlighting the need for greater awareness of the importance of financial planning. Niu et al. [19] examined the level of financial literacy and its impact on retirement preparation in China. The authors found that a significant proportion of Chinese individuals, particularly the elderly, women, and those with low educational attainment, lack financial knowledge. The results indicate that financial literacy has a strong and positive impact on various aspects of retirement preparation among the Chinese population, including determining retirement financial needs, developing long-term financial plans, and purchasing private pension insurance.

Emotional and Psychological Aspects of Retirement. In terms of emotional well-being, the research indicates that over 63.6% of professors feel psychologically prepared for retirement (Q17). However, among those who do not feel prepared, concerns such as idleness, loneliness, and financial worries emerge. The transition to retirement is not merely a financial change; it also involves emotional and social adaptation, where isolation and a lack of purpose can present significant challenges. Several authors have also researched the effects of retirement on professors and found feelings associated with financial concerns and depression [1, 23, 25].

Continuity in Work After Retirement. Many professors view retirement as a new productive phase, with over 43% of them planning to continue working due to a combination of factors such as personal fulfillment, financial necessity, and the desire to maintain social connections (Q15). This suggests that the academic environment, with its collaborative nature and ongoing intellectual production, is a space where many feel fulfilled and, therefore, are hesitant to completely detach from their activities. Shlomo and Oplatka [24], Cahill et al. [6], Davidovitch and Eckhaus [10], and Rowson and Phillipson [22] also identified that professors intend to continue working and contributing to academia after their retirement.

Preparation of a support network. Many participants mentioned the lack of a support network in retirement (Q16), with a considerable number still not having planned how this transition phase will look. This underscores the importance of institutional policies that help teachers develop emotional and social support, minimizing the risks of isolation and depression that may arise with retirement. Mugambi et al. [17] investigated the significant relationship between depression and adjustment to retirement among retired teachers in Meru County, Kenya. The authors conducted a survey with 1,800 retired teachers and their spouses. The findings of this study revealed a significant relationship between depression and adaptation to retirement. The study recommends that the Kenyan government organize pre- and post-retirement counseling

to assist teachers in coping with the challenges that can lead to depression during retirement.

Overall, our findings reveal a group of teachers who, despite being highly engaged in financial planning, still face emotional and social challenges related to retirement. The desire to continue contributing professionally after retirement indicates that ICT teachers view this phase as an opportunity to realign their lives while maintaining an ongoing role within academia. The development of institutional programs focused on psychological and financial support for retirement could be an important step to ensure a smoother transition for these professionals.

6   Threats to Validity

According to the guidelines provided by Wohlin et al. [27], threats to validity can be classified into four categories: conclusion validity, internal validity, construct validity, and external validity. We next discuss the main threats identified in the study and the strategies to mitigate them. **Internal Validity**: This refers to the ability to establish reliable causal relationships. Data collection via email and social media may introduce a self-selection bias, as participants who chose to respond may have characteristics or opinions that differ from those who did not respond, potentially compromising the causality of the results. To mitigate this bias, we employed stratified random sampling by region and other demographic variables, in addition to diversifying the data collection methods (e-mail and social media). Furthermore, the invitation to participate in the survey was written clearly and objectively to attract a broader range of participants.

Construct Validity: This relates to the appropriateness of the instruments used to measure the phenomena under investigation. The collection of emails through institutional pages and social media may have limited the participation of professors who do not publicly share their contact information, affecting the representativeness of the data. To mitigate this threat, we diversified the methods for obtaining contacts, including direct outreach to department heads and coordinators of ICT courses, to ensure the participation of all subgroups within the population.

External Validity: This refers to the ability to generalize the results to other populations. Data collection did not achieve a uniform distribution of participants across Brazil, which may limit the national representativeness of the research. Although we received responses from almost all states, the state of Amapá was not represented. To mitigate this threat, we sought to reach ICT professors from underrepresented regions, including Amapá. Future studies could replicate this research in other contexts, both nationally and internationally, to enhance the generalizability of the findings.

Conclusion Validity: This refers to the accuracy of inferences about the relationships identified in the data. In our study, a potential threat is the sample size (176 participants), which is small compared to the total number of ICT professors in Brazil, potentially compromising the accuracy of the conclusions. To mitigate this threat, future studies can improve data collection efforts by using a wider range of dissemination channels (such as specialized forums and academic networks) and increasing the number of responses to ensure a more representative sample.

7 Conclusions

This study investigated the perceptions of ICT professors at higher education institutions about retirement. The results indicate that, while a significant portion of faculty begins to plan for retirement early or in the middle of their careers, many have either not started this planning or do not intend to retire at all. The primary concerns identified are related to the loss of income and the psychological preparation needed for this transition, with a substantial number of faculty members feeling financially vulnerable and emotionally unprepared for retirement. Moreover, most participants expressed a desire to continue contributing to the academic environment or the field of ICT after retirement through activities such as research, consulting, and mentoring. However, many professors also indicated their intention to balance this professional continuity with leisure activities and travel.

These findings align with the themes of education in information systems and the management of organizational information systems. The importance of effective planning and preparation for retirement underscores the need for educational initiatives that prepare professors with the necessary skills and knowledge to navigate this transition. Additionally, the establishment of supportive networks and institutional policies can enhance the management of processes related to professors' retirement, ensuring a smoother transition while maintaining academic contributions. Finally, it is hoped that the results of this research will inform future retirement planning initiatives within educational institutions, guiding both faculty and institutions to minimize the financial and emotional impacts of retirement while enabling professors to continue making meaningful contributions to academia and society. In future work, we aim to replicate this study in other fields of knowledge and in different countries to compare results and develop a guide to support professors during this life stage.

Data Availability

The material produced during the research, such as the survey form, the 176 responses, and the coding of the open questions are available on Zenodo at https://zenodo.org/records/13948508.

Acknowledgments

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