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# *STUDY OF THE POSSIBILITY OF SECRETARIATS INTEGRATION IN GRADUATE PROGRAMS IN A FEDERAL INSTITUTION OF HIGHER EDUCATION*

## ESTUDO SOBRE A POSSIBILIDADE DE INTEGRAÇÃO DAS SECRETARIAS DE PROGRAMAS DE PÓS-GRADUAÇÃO EM INSTITUIÇÃO FEDERAL DE ENSINO SUPERIOR

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## ABSTRACT

This study aimed to analyze the possibility of integrating the secretariats of the Graduate Programs (PPG) of the School of Technology (CTC) at the Universidade Federal de Santa Catarina (UFSC). As methodological procedures, the deductive method, of an applied nature, qualitative approach, descriptive objective and, as strategy, the case study were used. Semi-structured interviews were carried out with 9 of the 17 technical-administrative servant in education (STAEs), located in the secretariats of the CTC Postgraduate Programs, whose script was based on the 20 processes that constitute the CTC Postgraduate Program benchmark manual, in addition to filling in tables according to the proposal of the NASA-TLX model. The collection of bibliographic data was carried out through the scientific databases Google Scholar, Redalyc, Scielo, and CAPES Periodicals Portal and the documentary data on the websites of the programs and institutional sectors. It was found that there is work overload in some processes. However, through a global analysis of the processes, which considered the maximum capacity of the STAEs, an average of 62% of the workload was found, which suggests moderate capacity. The results showed favorable and unfavorable elements to the proposal of integrating the Postgraduate Programs secretariats. An in-depth investigation is proposed on other aspects of feasibility for integration, namely, operational, structural and economic aspects.


**Keywords:** Integrated Secretariats. NASA-TLX Model. Benchmark Manual. Postgraduate Programs.


## RESUMO

Esse trabalho teve como objetivo analisar a possibilidade de integração das secretarias dos Programas de Pós-Graduação (PPG) do Centro Tecnológico (CTC) da Universidade Federal de Santa Catarina (UFSC). Utilizaram-se, como procedimentos metodológicos, o método dedutivo, de natureza aplicada, abordagem qualitativa, objetivo descritivo e estratégia o estudo de caso. Foram realizadas entrevistas semiestruturadas com 9 dos 17 servidores Técnico-Administrativos em Educação - STAEs, lotados nas secretarias dos PPG do CTC, cujo roteiro foi fundamentado nos 20 processos que constituem o manual de benchmark dos PPGs do CTC, além do preenchimento de quadros conforme a proposição do modelo NASA-TLX. A coleta dos dados bibliográficos foi realizada por meio das bases de dados científicas Google Scholar, Redalyc, Scielo e Portal de Periódicos da CAPES e os dados documentais nos sites dos programas e setores institucionais. Constatou-se que há sobrecarga de trabalho em alguns processos. No entanto, por meio de uma análise global dos processos, que considerou a capacidade máxima de atuação dos STAEs, constatou-se uma média de 62% da carga de trabalho, o que sugere capacidade moderada. Os resultados evidenciaram elementos favoráveis e desfavoráveis à proposição de integração das secretarias de PPGs. Propõe-se investigação aprofundada sob outros aspectos de viabilidade à integração, quais sejam, operacionais, estruturais e econômicos.


**Palavras-chave:** Secretarias Integradas. Modelo NASA-TLX. Manual de Benchmark. Programas de Pós-Graduação.

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## 1 INTRODUCTION

Higher education, specifically Brazilian graduate courses, was recognized in the 1950s, with the creation of the Coordination for the Improvement of Higher Education Personnel (CAPES) and the National Research Council (CNPq); later, the elaboration of Opinion No. 977, in 1965, issued by the Federal Council of Education (CFE), differentiated *lato sensu* (specialization courses) from *stricto sensu* (master's and doctoral courses) graduate programs (HOSTINS, 2006).

The Universidade Federal de Santa Catarina (UFSC), as a federal public Higher Education Institution (HEI) – inserted in this historical context and the focus of this study –, started operating from its recognition, on December 18, 1960, by the Ministry of Education (MEC) in accordance with Federal Law No. 3.849 (BRASIL, 1960). With 60 years of existence, the UFSC expansion has led to an increased hiring of professionals to compound its administrative staff, which, as in other federal public HEIs, occurs through a civil service entrance examination based on Law 8.112, dated December 10, 1990, which governs federal public servants' career (BRASIL, 1990).

Considering UFSC time of existence, it is assumed that this university has numerous academic demands, linked to structural growth during its period of existence, a fact that indicates that is necessary to size the workforce according to institutional administrative tasks. In this sense, the Business Process Management (BPM) can be highlighted as an alternative management tool to assist technical-administrative public servants in education (STAEs) with regard to administrative demands, and involves application of techniques and practices to monitor and control processes (MAIDANTCHIK; ROCHA, 2002).

It should be emphasized that the USFC School of Technology (CTC) made an effort aimed at the process standardization by means of good practice manuals – the benchmark manuals –, whose content deals with mapping processes carried out at the undergraduate, graduate and department secretariats, based on the daily practices of the STAEs working in those sectors (JULIATTO, 2016). However, at the same time it is possible to observe the development of tools to help in the activity performance, the workforce instability affects all UFSC Schools, and the retirement of servants who complete the required length of service can be mentioned as one the elements that impact the environment.

Given this scenario, it is possible to use workload measurement methods, such as the National Aeronautics and Space Administration Task Load Index (NASA-TLX), developed

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by Hart and Staveland (1988), whose objective is to evaluate each subject's workload based on six subscales, namely: mental demand, physical demand, temporal demand, performance, effort, and frustration. Thus, an opportunity was perceived to carry out a study to investigate elements, such as staff sizing and operational conditions in graduate program (PPGs) secretariats and, from them, verify the possibility of integrating those secretariats in a single environment, based on the BPM concepts and workload assessment.

Considering the increase in the number of graduate courses at UFSC and the STAE role in PPG secretariats, where administrative processes are prepared based on regulations by the Pro-Rectory of Graduate Studies (PROPG) (UFSC, 2020a), this study focused its analysis on the STAEs that work at the CTC PPGs, and the following problem question emerges: **Would it be possible to integrate the UFSC CTC PPG secretariats?**

In view of the situation presented, the objective of this work is to analyze the possibility of integrating the UFSC CTC PPG secretariats. This research is relevant because, to date, there has not been a study at UFSC aimed at analyzing the human resource workload, in this case, the STAEs working at the UFSC CTC PPG secretariats. One considered opportune to make this analysis and present to UFSC – through the Pro-Rectory of People Development and Management (PRODEGESP) and the Planning and Budget Secretariat (SEPLA) – elements that may be viable for integration of UFSC PPGs secretariats based on the BPM concepts and the NASA-TLX Assessment Tool.

Finally, this research is feasible due to the availability of the STAEs working at the CTC PPG secretariats, necessary for data collection. Moreover, it was possible to access all the necessary material, both bibliographic – available in scientific databases –, and documentary – which corresponds to the institutional regulations found on the UFSC website –, based on the methodology proposed in this research.

This article is structured as follows: theme contextualization, research problem and general objectives, in addition to justification; theoretical background, in which the themes of University Management and Graduate Programs, Process Management and Benchmarking and Workforce Sizing are addressed; presentation and discussion of the results; final considerations, and references used.

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## 2 THEORETICAL BACKGROUND

### 2.1 UNIVERSITY AND GRADUATE PROGRAM MANAGEMENT

HEIs are managed, in general, by centralized structures, which present the bureaucratic model (municipalities) so that the needs of their clients are satisfied, in this case, society (BERNARDES; ABREU, 2004). Universities, including public ones, which underwent reforms in 1968, demonstrate the need to break the existing rigid structure and adapt to the global transformations that involve higher education (SAMPAIO; LANIADO, 2007). University management comprises a set of complex actions, aimed at the administrative and academic spheres, and their actors, who assume this role in the institution, should be trained and have "administrative, technical and human skills" (SOUZA, 2009, p. 24). For the author, management involves elements to achieve the result expected, including quality of life at work, management by processes, organizational learning, and entrepreneurial administration.

HEI recognition, which often occurs at national and international levels, becomes one of the guides of managers' objectives regarding prominence that, in the case of Brazil, occurs through the Ministry of Education (MEC), which ranks higher education courses and identifies the HEIs in the country in a qualitative manner (GOMES et al, 2013). As a result of the MEC evaluation, students are attracted to the best qualified universities, although it involves some basic maintenance issues (financial, housing, food, transportation) that allow students to stay in these institutions (VASCONCELOS; SILVA, 2011).

In the university context, Law No. 9.394 establishes in item III, art. 44, that PPGs represent master's and doctoral degrees, specialization, and improvement courses, among others, which are intended for those who have completed an undergraduate course and are able to meet the requirements of the institution they intend to enter (BRASIL, 1996). The MEC divides PPGs into two groups: *lato sensu* programs and *stricto sensu* programs (CAPES, 2020a). *Lato sensu* PPGs include only specialization courses, excluding improvement courses and others; *stricto sensu* PPGs represent the master's and doctoral courses authorized, recognized and approved by the MEC, upon request to the National Council of Education (CNE) (CAPES, 2020a).

The process of PPG course evaluation tales place every four years, through the Sucupira Platform (CAPES, 2020b). This platform was created on May 30, 2012, from cooperation between CAPES and the Federal University of Rio Grande do Norte (UFRN),

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aimed at maintaining a quality standard with regard to the programs evaluated – identifying possible regional deficiencies –, with the participation of the academic and scientific community (CAPES, 2020b).

Once the CAPES evaluation is over, the PPGs are rated on a 1-to-7 scale, where 3 is the minimum score for program recognition and participation in the Evaluation System, and 7 is the highest score, considered international excellence (MACCARI et al. al, 2014). Also according to the authors, programs ranked 5 are considered Graduate Support Programs (PROAP), and those ranked 6 and 7 are Academic Excellence Programs (PROEX).

The evaluation shows that the number of Brazilian HEIs is growing, leading to an increase in the number of PPGs since the 1990s (NGANGA et al, 2016), a scenario that causes growing administrative demand on those programs and a higher number of administrative processes. Therefore, alternatives are sought to optimize these processes, which range from the processes themselves to the description of activities and tasks and, at the same time, restructuring of personnel necessary to meet this demand. In this context, process management will be discussed below.

## 2.3 PROCESS MANAGEMENT AND BENCHMARKING

Organizations are composed of diverse resources, which include physical structures, equipment, and financial and human capital, which together constitute an organizational complex (ROCZANSKI, 2009). Process management (PM) had its origins in the 18$^{th}$ century, a period in which the Industrial Revolution took place through the division of labor and mechanized procedures, which gained strength mainly through the management theory instituted by Frederick Taylor (ABPMP, 2013).

To assist administrative process management it is possible to use the Business Process Management (BPM) which, according to Maidantchik and Rocha (2002), is the application of concepts, techniques and practices to monitor, control, and improve processes. As an initial step and to implement BPM, one should conduct a process mapping, which is "to describe in a simple manner the roles of each person involved and also the behavior of each task in the process" (FLORES; AMARAL, 2014, p. 235).

In addition to process mapping, it is possible to apply the Mudge Diagram, which consists of ranking processes based on their relevance, analyzed in pairs, according to the subjects' reports, and results in a ranking of processes, according to the existing relevance

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degree among them (BALDASSO DE GODÓI et al, 2019). Furthermore, the search for quality in organizational products resulted in the pursuit of efficient actions, performed by other organizations, whose result was satisfactory (OLMEDO; SOLEDAD, 2004), which is the principle of Benchmarking, that is, perform actions based on existing experiences and assertive examples, according to the intended objective, in order to improve continuously and adapt the way organizations act.

At UFSC, the search for improvements in administrative processes is a topic that has been treated seriously, mainly at the CTC, which presents, on its website, mapping of work processes that occur at the administrative secretariat, departments, and undergraduate and graduate courses coordination sectors, and also all procedures of outsourced companies that are linked to this School (UFSC, 2020a). Regarding the three manuals available, the graduate benchmark manual served as the foundation for this study. In accordance with the processes carried out at the PPG secretariats, it is possible to define personnel sizing based on the distribution of workload involved, a matter that will be addressed below.

## 2.5 WORKFORCE SIZING – NASA-TLX ASSESSMENT TOOL

Workforce sizing (WFS) means determining the number of people needed in a given environment to plan the personnel allocation according to the individual profiles that suit the job (SERRANO et al., 2018). For Silvério et al. (2019, p. 1910), in order to establish a sizing model, it is necessary to make "a prior analysis of the unit to be sized, aiming to identify the adjustment need level in the typical WFS model to obtain a greater WFS adherence and effectiveness."

Some models were developed to measure the professionals' work, and among them it is possible to mention the National Aeronautics and Space Administration Task Load Index (NASA-TLX), which, in a qualitative manner, is capable of evaluating workload through variables that provide data regarding physical and mental conditions and allows verifying the load expended by the worker in their work activities, regardless of the type of profession practiced (ARANDA et al., 2018). The NASA-TLX, tool used to evaluate workload, was developed by Hart and Staveland (1988) at the NASA Ames Research Center, located in California, United States. According to the authors, it was initially created to assess aviation professionals' workload but was used later to assess numerous professionals, such as nurses, students, drivers, soldiers, and physicians.

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The NASA-TLX has six subscales (mental demand, physical demand, temporal demand, performance, effort and frustration) and is reliable, since it has already been applied in numerous studies whose results were satisfactory in terms of workload definition. Once the theoretical background is finished, the next section describes the methods used in this research.

## 3 METHODS

This work used the deductive method, whose "[...] need for explanation does not reside in the premises, but in the relationship between the premises and the conclusion" (MARCONI; LAKATOS, 2008, p. 69). Thus, it aimed to analyze the relationship between the administrative process activities and the STAE workload at CTC PPG secretariats in order to verify if it is possible to integrate those secretariats. Regarding nature, it is an applied study, which intended to create knowledge and use it to solve specific problems (SILVA; MENEZES, 2005). Thus, one tried to present elements to analyze the possibility of creating an integrated secretariat as a practical solution that benefits the distribution of activities to the professionals working in the secretariats of these programs.

The study has a qualitative approach, through which the researcher interpreted and identified the process meanings (SILVA; MENEZES, 2005). This work sought to interpret the activities developed in the research environment based on the perception of social actors within that environment and align them with the process and workload management meanings, considering that these elements are essential to a potential integration of CTC PPG secretariats.

As for the objective, this study is descriptive and intended "to describe the characteristics of a given population or phenomenon or the establishment of relationships between variables [...]" (SILVA; MENEZES, 2005, p.15). In this way, an attempt was made to describe the administrative processes carried out at the CTC PPG secretariats and workload of each STAE related to those processes, listing possible elements to verify if it is possible to integrate those secretariats.

As a research strategy, the case study was used which, according to Yin (2001, p. 27), consists of examining "contemporary events, but when relevant behavior cannot be manipulated." Thus, the CTC PPG secretariats were chosen as environments to be explored in this work due to the existence of the CTC graduate benchmark manual, an element that

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contributes to the understanding of the administrative processes that occurred in the study environments focus of this research and which the script used in the interviews was based on.

The research was conducted in June and July 2020, a period when administrative activities usually take place due to the academic period of UFSC PPGs. Thus, STAEs working at the CTC PPG secretariats were available and were previously contacted by email for the proper data collection by means of interviews via Google Meet, a video-communication service. As for the geographic scope, intentionality was chosen as opposed to randomness (TRIVINOS, 1987). In this research, the group of delimited subjects is located at UFSC, an HEI that has 11 Schools, 39,515 students, 2,758 professors and 3,071 STAEs (UFSC, 2020d).

Among those Schools and considering the research scope, the highlight is the School of Technology (CTC), which developed the PPG benchmark manual. The CTC has 14 PPGs (12 academic programs and two professional master's programs), 2,282 students, 422 professors, and 17 STAEs working at the secretariats of these programs (UFSC, 2020e). The choice for analyzing these 17 subjects was due to the PPG benchmark manual – analysis guiding material –, as it contains a description of the administrative processes carried out at these secretariats.

Among these subjects, the researcher, who is also a STAE working at one of the CTC PPGs, has not participated as a subject. With regard to the other servants, which totaled 16 subjects, nine participated in the data collection and were identified from S1 to S9 in the data analysis and discussion. Representing the research technical procedures, data collection was divided into two stages: bibliographic and documentary survey, which composed the theoretical framework that structured the theoretical background and supported the data analysis and discussion; and the interviews, which represented the data analyzed as proposed by the researcher.

The first stage occurred through bibliographic and documentary survey (secondary data), when data were collected on the following scientific databases: Google Scholar, Redalyc, Scielo and CAPES Periodicals Portal, using the keywords: "Instituição de Educação Superior" [Higher Education Institution], "Programa de Pós-Graduação" [Graduate Program], "Gestão de Processos" [Process Management] "Mapeamento de Processos" [Process Mapping], "Carga de Trabalho" [Workload], "NASA-TLX", "Benchmark", "Gestão Universitária" [University Management] and respective translations into English, combined

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or separately. Documentary survey was also made in the institutional structure, on the CTC website, in the current UFSC and PROPG regulations – applied to PPGs and available on the institution's website –, on the CAPES website, and in documents related to the administrative processes made available on the CTC website.

In the second stage, a semi-structured interview was elaborated based on the administrative processes described in the CTC graduate benchmark manual, namely: discipline creation; service to public; scholarships; ticket purchase; doctoral defense; master's defense; student dropping-out; diploma; coordinator elections; student representative elections; teaching internship; roll-call sheet printing and grade publication; enrollment; Sucupira Platform; extended deadline for course completion; doctoral qualification; master's qualification; collective body meeting; master's and doctoral selection, and leave of absence. According to Saunder, Philip and Thornhill (2009), the semi-structured interview is a semi-structured questionnaire where it is possible to insert more questions.

The preliminary analysis of the administrative processes carried out at the secretariat consisted of the first block of questions. The second block of questions was based on the NASA-TLX Assessment Tool. According to Hart and Staveland (1988), this tool considers the possibility of analyzing six dimensions in individuals: physical demand, mental demand, temporal demand, performance, effort, and frustration. According to the tool by Hart and Staveland (1988), the categories are identified by the abbreviations DM (mental demand), DT (temporal demand), DF (physical demand), NS (performance level), NE (effort level) and NF (frustration level).

Following the tool guidelines, scores ≤7.5 were considered acceptable workload and scores >7.5 were considered heavy workload. Therefore, the data collected were applied in an equation that consists of calculating the total workload (CTP) as a function of each specific process, as shown in Figure 1.

**Figure 1** Workload Calculation

$$CTP = \frac{DM.PDM + DT.PDT + DF.PDF + NS.PNS + NE.PNE + NF.PNF}{PDM + PDT + PDF + PNS + PNE + PNF}$$

Source: Elaborated by the author from Aranda et al. (2018).

A pilot test – or pre-test – was carried out with a STAE working at a PPG of another UFSC School before the beginning of the interviews with the subjects defined for this research. A second interview was conducted as the last stage of data collection, in which the

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Mudge Diagram was applied, as addressed by Se (2010) and Sena, Trevisol Neto and Varvakis (2013). In terms of data processing, this study is based on content analysis which, by means of systematic procedures and in accordance with the content description, seeks to understand the environment or the sender's message and represents a process that establishes an analysis structure (BARDIN, 2011). Thus, the analysis was aligned through theory, benchmarking manual data, and the proposed objective. After the presentation of the methods, the next section deals with data analysis and discussion.

## 4 RESULTS AND DISCUSSION

Based on the methods described for this research, the primary data were collected through interviews with the STAEs working at the UFSC CTC PPG secretariats. Nine out of the 17 STAEs were interviewed and then identified as subjects (S), from S1 to S9. Initially, the collected data referred to personal information (age and sex), professional information (months working at PPG and months working at UFSC) and CAPES evaluation, that is, programs considered PROAP or PROEX. The information is found in Chart 1.

**Chart 1** Study subjects' information

| SUBJECT | AGE (YEARS) | PROAP OR PROEX | SEX | PROGRAM TIME (MONTHS) | UFSC TIME (MONTHS) |
|---|---|---|---|---|---|
| **S1** | 37 | PROEX | Female | 23 | 84 |
| **S2** | 44 | PROEX | Female | 104 | 106 |
| **S3** | 35 | PROAP | Female | 96 | 108 |
| **S4** | 43 | PROEX | Female | 22 | 22 |
| **S5** | 41 | PROAP | Female | 8 | 8 |
| **S6** | 27 | PROEX | Female | 36 | 36 |
| **S7** | 28 | PROAP | Male | 21 | 21 |
| **S8** | 36 | PROEX | Male | 36 | 36 |
| **S9** | 57 | PROEX | Male | 384 | 432 |

Source: Elaborated by the author based on data collection.

Based on the 20 processes described in the methods section, the interview began verifying the validity and application of the processes at the secretariat. Respecting the particularity of S1, S4, S5, S6 and S9, most subjects stated that the processes take place and are applied at the respective PPGs.

The interview then verified the frequency of each process, that is, how regularly the processes occur (daily, weekly, monthly, quarterly, semiannual, annual or bi-annual). It was observed that service to public represents the process with the highest daily occurrence indicated by all subjects. Master's defense, doctoral defense, diploma, and leave of absence

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are highlighted as weekly processes. Representing the monthly processes, the collective body meeting stood out because it was mentioned by most subjects. Processes considered to be quarterly usually occur in programs with a quarterly academic regime. Sucupira Platform, student representative elections, discipline creation, and masters' and doctoral selection are mentioned as annual processes. Finally, coordinator elections take place biannually according to most subjects.

Subjects also informed how each process occurs (face-to-face, by e-mail or by telephone). It was observed that all processes involve at least two types of activities: face-to-face service and by email. This indicates on-site STAE availability at some stage in all processes. Continuing the interview, questions were asked about the periods of higher and lower process demand. The answers were varied, since the subjects work in programs that differ in terms of process periodicity. It was noticed that, during the year, there are at least 18 processes in the months of March, June and August, out of a total of 20 under analysis, as previously discussed. Thus, it was found that there is seasonality in the secretariat activities.

The script verified the process relevance level, on a 1-5 scale, which ranged from the least relevant (1) to the most relevant (5). It was observed that at least one subject considered the processes very relevant (17 processes) or extremely relevant (20 processes). Sucupira Platform (nine subjects) and master's and doctoral defenses (eight and nine subjects, respectively) stood out, reaching the maximum score on the scale. Next, the subjects were questioned about their expertise regarding the processes. It was noticed that there is a significant number of subjects who has appropriate expertise to deal with the processes and have no doubts. However, there are subjects that have many doubts, as follows: S2 (service to public), S1 (scholarships), S4 and S6 (coordinator elections), S1 and S6 (Sucupira Platform) and S4 (masters' and doctoral selection).

Then, subjects were asked about their dependence on other sectors to carry out the processes. In general, the processes that involve directly the Graduate Academic Control (CAPG) system (enrollment; leave of absence; extended deadline for course completion; student dropping-out; roll-call sheet printing and grade publication) and those carried out within the scope of the program (master's and doctoral qualification and defense; collective body meeting; ticket purchase – PROEX programs –; scholarships, and master's and doctoral selection) do not depend on another sector.

However, it was observed that there are no processes that are completely independent,

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that is, all of them have some dependence on another sector. An institutional sector cited recurrently by S1, S2, S3, S7 and S8 was the UFSC Pro-Rectory of Graduate Studies (PROPG) (UFSC, 2020b), located in the university central administrative sector, where some processes involving PPGs take place compulsorily, such as discipline creation (registration), scholarships and ticket purchase (approval of payment for PROAP programs) (CAPES, 2020c; 2020d), and also other processes, such as public consultations about changes in legislation and new guidelines).

Next, the questionnaire addressed the program coordination guidance in the processes. It was observed that the program coordination sector is available in all processes, with emphasis on service to public, scholarships, Sucupira Platform, collective body meetings, and masters' and doctoral selection, and all subjects affirmed this situation. Then, subjects were asked about feeling confident or not in relation to the processes. It was found that, in general, they feel confident when dealing with the processes, which may be related to the length of service in the sector.

The next questioning was about taking specific training courses for each process. Subjects stated, unanimously, that they have not received or are not undergoing training related to the processes. The Sucupira Platform course is the only one offered by the UFSC training sector and by PROPG on an annual basis, to help servants provide information about the programs on this platform for later evaluation by CAPES, assuring the graduate program quality standard in the country (CAPES, 2020b) and the financial resource distribution to PPGs for qualified labor training (MACCARI et al, 2014).

Subsequently, the types of platform used in processes were verified, in addition to their individual characteristics regarding domain, ease of access and suitability. The platforms indicated and possibly use were: CNPq – Carlos Chagas Integrated Platform; SCBA – System for Grants and Benefits Control; SCDP – Per diem and Ticket Concession System; CAPG – Graduate Academic Control; and SPA – Administrative Management System. It was found that the CAPG is the most accessed, since it is frequently used in 16 of the 20 processes under analysis. Afterwards, subjects were consulted about the possibility of process automation. Graph 3 presents the result.

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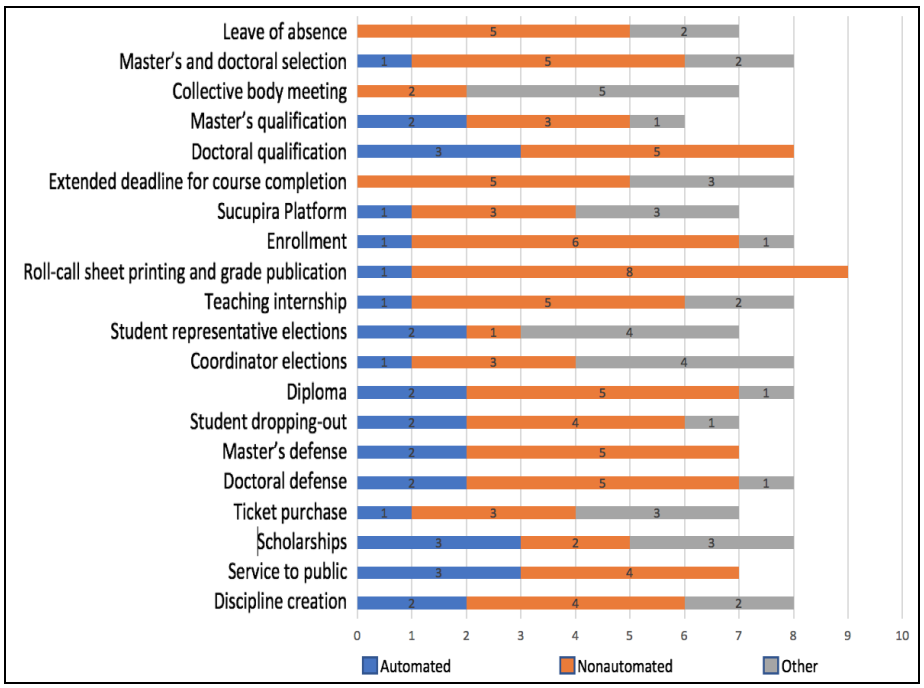
**Graph 3** Process automation degree




Source: Elaborated by the author based on data collection.

It is observed that lack of automation was pointed out in many of the analyzed processes by most of subjects. Then, subjects were asked about the relationship with colleagues in the sector regarding process distribution. Subjects S1, S2, S3, S4, S8 and S9 share the sector activities, a situation that favors the experience exchange, which is precisely the principle of benchmarking described by Olmedo and Soledad (2004). The other subjects work individually in the secretariat. It is understood that, in this case, personnel sizing should occur to identify the necessary number of servants for a given sector depending on the demands (VENTINI; PEREIRA, MORAES, 2019).

The next questioning checked whether the processes are up to date or out of date – based on current institutional guidelines –, whether they are functioning properly, and what could be improved. Subjects reported that most processes (19 out of 20) are up to date, which favors process management. Then, the program professors' and students' knowledge of the process stages was questioned. It was observed that, only two (master's qualification and collective body meetings) out the 20 processes analyzed are mentioned by the subjects as those which professors and students have no doubt about. This scenario indicates rework at the secretariats, which suggests that it is necessary to apply BPM concepts to make improvements to the process quality (MAIDANTCHIK; ROCHA, 2002).

Finally, subjects were asked about the existence of other secretariat processes that

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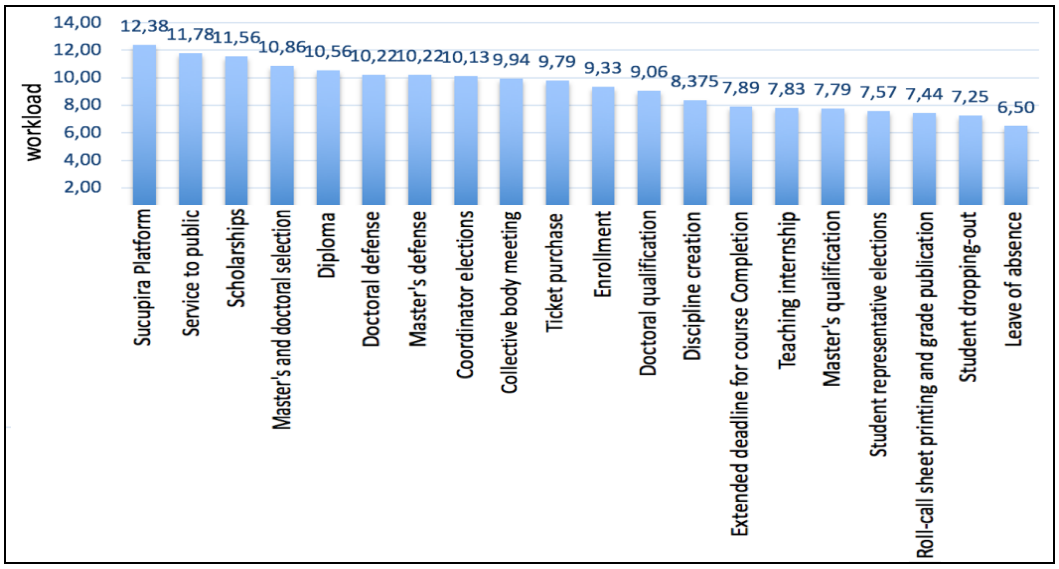
were not mentioned among the processes dealt with in the graduate benchmark manual. Only two subjects suggested other secretariat activities seen as processes. After completing the first question block, the second interview stage consisted of collecting individual information, in each of the 20 analyzed processes, to calculate the workload proposed by the NASA-TLX Assessment Tool, by Hunt and Staveland (1988). Graph 5 presents the data in descending order.

**Graph 5** Calculation of the mean subjects' workload per process




Source: Elaborated by the author based on data collection.

It was found that only three of the 20 processes analyzed maintained mean scores below or close to the threshold value, that is, 7.5: leave of absence (6.50), student dropping-out (7.25), and roll-call sheet printing and grade publication (7.44). The other 17 processes reached scores higher than 7.5. The high Sucupira Platform score, for example, reports the necessary STAE commitment; STAEs are assigned by coordinators to provide information, which requires high levels of attention, since these data will be evaluated by CAPES annually and every four years using this very platform (CAPES, 2020b). Hart and Staveland (1988) also consider that high scores denote that factors such as mental demand and physical effort, and even temporal demand, are required in the STAE activities.

An interview was conducted for application of the Mudge Diagram – representing an additional data collection –, resulting in a process ranking regarding relevance according to the subjects' opinion (BALDASSO DE GODÓI et al, 2019). In this sense, the 10 most representative processes were considered (Graph 6).

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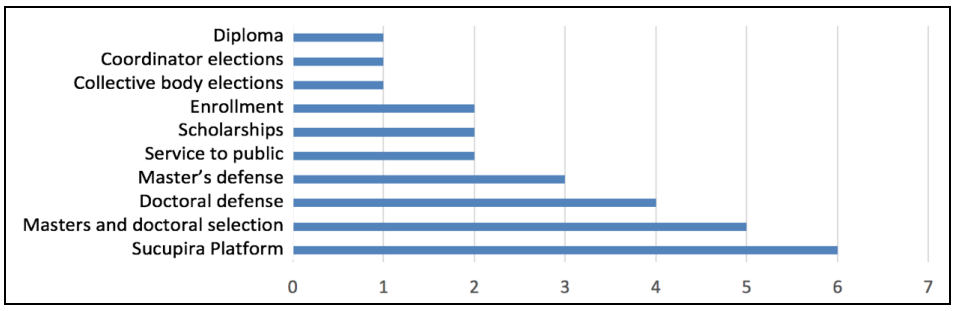
**Graph 6** Processes identified as those of greatest relevance by subjects




Source: Elaborated by the author based on data collection.

It was observed that the Sucupira Platform was highlighted by most subjects (S1, S3, S6, S7, S8 and S9). It is possible to compare the 10 processes considered priority in Graph 6 with the same amount of the highest workload score represented in Table 2 below.

**Table 2** Ranking of the 10 processes related to the highest workload scores and in the Mudge Diagram

| Process | Workload | Mudge Diagram |
|---|---|---|
| Service to public | 2° | 5° |
| Scholarships | 3° | 6° |
| Ticket purchase | 10° | - |
| Doctoral defense | 6° | 3° |
| Master's defense | 7° | 4° |
| Diploma | 5° | 10° |
| Coordinator elections | 8° | 9° |
| Sucupira Platform | 1° | 1° |
| Collective body meeting | 9° | 8° |
| Master's and doctoral selection | 4° | 2° |

Source: Elaborated by the author based on data collection.

It was possible to observe that nine of the 10 listed processes appear in both analyzes, even though they are not arranged in the same prioritization order. The Sucupira Platform also took first place in the Mudge Diagram (six out of nine subjects), which intended to list the processes in relation to the relevance degree through comparison and consequent ordering among the others (SE , 2010; SENA; TREVISOL NETO; VARVAKIS, 2013). Furthermore, it was still possible to make a total diagnosis, considering the maximum STAE capacity (15) based on the workload scores in the processes, as shown in Table 3.

Thus, when considering the number of subjects by the total scale score of the NASA-TLX Assessment Tool, it was possible to calculate the maximum possible score per process, which is represented in column A and whose values ranged from 105 (seven subjects) to 135 (nine subjects). Each subject's workload score per process was added to the aforementioned scores, and the result is found in column B.

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**Table 3** Global workload analysis

| Process | Subjects | | | | | | | | | Column A | Column B | Column C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | Number of interviewees by the maximum scale score (15) | Sum of workload scores | Mean percentage per process |
| **Discipline creation** | 9.5 | 6.0 | 9.5 | 12.5 | - | 5.0 | 9.0 | 7.5 | 8.0 | 120 | 67 | 56 % |
| **Service to public** | 13.0 | 14.5 | 14.0 | 12.5 | 11.5 | 9.0 | 11.5 | 6.5 | 13.5 | 135 | 106 | 79 % |
| **Scholarships** | 13.0 | 13.0 | 13.5 | 10.0 | - | 10.0 | 10.5 | 10.0 | 12.5 | 120 | 93 | 77 % |
| **Ticket purchase** | 9.0 | 8.5 | 13.5 | 10.5 | - | - | 9.5 | 9.5 | 8.0 | 105 | 69 | 65 % |
| **Doctoral defense** | 9.0 | 13.0 | 13.0 | 12.0 | 10.5 | 8.5 | 10.5 | 8.5 | 7.0 | 135 | 92 | 68 % |
| **Master's defense** | 8.5 | 13.5 | 13.0 | 12.0 | 10.5 | 8.5 | 10.5 | 8.5 | 7.0 | 135 | 92 | 68 % |
| **Student dropping-out** | 8.5 | 6.0 | 9.5 | 10.0 | - | 2.5 | 8.5 | 6.0 | 7.0 | 120 | 58 | 48 % |
| **Diploma** | 9.5 | 10.5 | 12.0 | 14.0 | 11.5 | 9.0 | 11.0 | 8.5 | 9.0 | 135 | 95 | 70 % |
| **Coordinator elections** | 12.5 | 9.0 | 9.5 | 7.0 | - | 12.5 | 11.5 | 8.0 | 11.0 | 120 | 81 | 68 % |
| **Student representative elections** | 11.5 | 8.0 | 6.0 | 5.0 | - | 10.5 | 7.0 | - | 5.0 | 105 | 53 | 50 % |
| **Teaching internship** | 8.5 | 3.5 | 6.5 | 11.5 | 9.0 | 5.0 | 10.5 | 7.0 | 9.0 | 135 | 71 | 52 % |
| **Roll-call sheet printing and grade publication** | 6.0 | 11 | 5.5 | 12.5 | 8.5 | 4.5 | 6.0 | 4.0 | 9.0 | 135 | 67 | 50 % |
| **Enrollment** | 7.5 | 11.5 | 6.0 | 14.0 | 8.5 | 5.5 | 10.5 | 6.5 | 14.0 | 135 | 84 | 62 % |
| **Sucupira Platform** | 14.0 | - | 12.5 | 13.5 | 11.5 | 12.0 | 12.0 | 9.5 | 14.0 | 120 | 99 | 83 % |
| **Extended deadline for course completion** | 9.0 | 3.5 | 9.5 | 11.5 | 8.0 | 6.5 | 10.0 | 5.0 | 8.0 | 135 | 71 | 53 % |
| **Doctoral qualification** | 9.5 | 6.5 | 8.5 | 11.5 | 11.5 | 9.5 | 9.0 | 6.5 | 9.0 | 135 | 82 | 60 % |
| **Master's qualification** | - | 1.5 | 8.5 | 7.0 | 11.5 | 9.5 | 10.0 | 6.5 | - | 105 | 55 | 52 % |
| **Collective body meeting** | 12.0 | 9.5 | 10.0 | 10.0 | - | 11.0 | 11.5 | 7.5 | 8.0 | 120 | 80 | 66 % |
| **Master's and doctoral selection** | 12.5 | 11.0 | 12.0 | 13.0 | - | 9.5 | 9.5 | 8.5 | - | 105 | 76 | 72 % |
| **Leave of absence .** | 5.5 | 6.5 | 4.0 | 10.0 | - | 3.5 | 8.0 | 5.5 | 9.0 | 120 | 52 | 43 % |
| | | | | | | | | | | | **Mean** | **62 %** |

Source: Elaborated by the author based on data collection.

Results denote that STAEs have workload that is median or slightly above this value, suggesting most processes require a moderate effort level from this perspective, that is, considering 100% as the maximum possible score. In addition, it was possible to calculate the mean total percentage of the process set, which reached 62%. Therefore, it was possible to conclude that there is the possibility of improving personnel use and proposing an integrated secretariat structure based on the processes analyzed. It is also inferred that there are favorable and unfavorable elements regarding improvements in the automation and standardization for secretariat integration, as can be seen in Chart 2.

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**Chart 2** Favorable and unfavorable elements for the secretariat integration

| Favorable | Unfavorable |
|---|---|
| Most of the interviewees (eight) have been working in the program for more than 21 months, a time that is supposed to be reasonable in terms of mastering the processes and which was corroborated by the subjects' responses in this regard. | The STAEs who share sector activities with colleagues were those with the highest workload scores. |
| The PPG benchmark manual has been available since 2015. | Seventeen processes were identified (Graph 12) that presented workload scores above the threshold value proposed by the NASA-TLX Assessment Tool. (7.5). |
| It is possible to use the PPGs benchmark manual as basic material in carrying out training courses for STAEs. | There are other supposed processes carried out in the PPG secretariats that were not analyzed and that may influence the workload scores calculated in this study. |
| There are 14 processes that use the CAPG academic system, which already concentrates the secretariat activities in a single system. | There are particularities that differentiate the activities performed at the PROAP and PROEX secretariats. |
| Professors and students know the process stages, which favors the secretariat regarding activity flow in a reasonable time. | There is a lack of automation in almost all processes, as reported by interviewees (Graph 9), which enables suggesting process improvement and automation. |
| It was possible to determine the process prioritization from workload calculation and by the Mudge Diagram. | There is no integration between CAPES system, CNPq system and internal UFSC systems (CAPG, SPA), which leads to rework. |
| Through the global workload diagnosis (Chart 25) it was possible to verify the mean total workload score, which reached a percentage of 62% and represented a moderate effort made by STAEs to carry out the processes. | There are no regular specific training courses directed at the processes analyzed, which could lead to improvements in existing processes. |
| | There is variation in the academic program regime, which may represent a limiting factor regarding the process alignment. |
| | With regard to the 17 STAEs working at PPG secretariats, only nine participated in the study. |

Source: Elaborated by the author based on data collection (2020).

Confronting the positive and negative elements described here, the conclusion is that one should carry out the following preliminary actions: a) evaluation of the 28 processes mentioned by the subjects through the model adopted in this research, to evaluate the processes that are not mapped in the PPG benchmark manual and verify the workload scores of all secretariat processes; b) automation of critical processes, in order to reduce the STAE workload and improve the secretariat activity flow; c) systems integration, to improve the process efficiency, both internal and external; d) review and re-assessment of the duty set of STAEs working at those sectors, with emphasis on the Sucupira Platform, considered the most critical process; e) broad feasibility study (structural, economic, personnel), to assess the possibility of structuring an integrated secretariat that should involve some institutional sectors, related to physical (CTC Directorate) and personnel (PRODEGESP) capacity, and f) personnel resizing, which is responsibility of PRODEGESP, through a STAE sizing study,

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based on the results of the suggestions of this research.

## 5 FINAL CONSIDERATIONS

This research aimed to analyze the possibility of integrating the UFSC CTC PPG secretariats based on the BPM concepts and NASA-TLX Assessment Tool. It was concluded that there are both favorable and limiting elements for the CTC PPG secretariat integration, which require in-depth study, given that this research used only the PPG benchmarking manual as analysis guide. The entire analysis was carried out based on a process set that constituted the PPGs benchmark manual, considered representative by most programs. Besides, despite the occurrence of high workload scores, obtained in this study based on the NASA-TLX Assessment Tool, it was possible to verify the possibility of secretariat integration based on the maximum percentage calculation (62%) of the workload means, which indicated a median use of the STAE total capacity at the secretariats.

Integration is already a reality at UFSC, as occurred at the School of Biological Sciences (CCB) through the Integrated Graduate Secretariat (SIPG), and at the School of Socio-Economic Sciences (CSE) through the Course Integrated Secretariat (SIC). The SIPG, for example, is responsible for the academic and administrative management of *stricto sensu* PPGs, including six academic programs and one professional program. Thus, the SIPG shows that PPG secretariat integration is possible and can become an object of in-depth study so that to verify how this integration occurred.

In this sense, a comprehensive investigation is proposed, encompassing SIPG, SIC and also other issues related to the integration feasibility, such as operational, structural (physical and organizational space) and economic elements, which were not addressed in this study because it is only a preliminary analysis based solely on administrative processes. The suggestion is that an in-depth analysis of the results of this research should be done, mainly due to the processes that presented high workload scores, which could encourage automation actions.

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