Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

Sistema de gestão de atividades acadêmicas: uma análise sob a perspectiva da intenção, uso e desempenho no Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG)

Sistema de gestión de la actividad académica: un análisis desde la perspectiva de la intención, el uso y el rendimiento en el Centro Federal de Educación Tecnológica de Minas Gerais (CEFET-MG)

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• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

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ABSTRACT

Goal: to analyze whether the intention and use of the Integrated Academic Activities Management System (SIGAA) has a positive effect on individual user performance, from the perspective of the Unified Theory of Acceptance and Use of Technology (UTAUT), at the Federal Technological Education Center of Minas Gerais (CEFET-MG). **Methodology/approach**: the research typology is causal, quantitative, qualitative and a case study, through the application of questionnaires to professors and administrative staff. The quantitative analysis of the results shows the users' perceptions through the Cronbach's Alpha Coefficient and the validation of the constructs through the Average Ranking of the items within each block of the questionnaire applied. **Originality/relevance**: this is an original study as it seeks to understand individual performance associated with the acceptance of academic management software, using an already consolidated theory (UTAUT). **Main findings**: the results show that the acceptance and use of the SIGAA system has a significant effect on the individual performance of its user, but this is not exceptional, given that the system is a tool that is made available for use and facilitates the operation of records. **Theoretical contributions**: the model resulting from this research, with the inclusion of the performance construct in the UTAUT, makes a theoretical and methodological contribution to other research with the same purpose. **Management contributions:** The study provided suggestions for possible improvements to be implemented in academic activities management systems, given their importance for educational institutions.

Keywords: Integrated Management System; SIGAA; UTAUT, Individual Performance; Educational Institutions.

RESUMO

Objetivo: analisar se a intenção e o uso do Sistema Integrado de Gestão de Atividades Acadêmicas (SIGAA) exerce efeito positivo no desempenho individual do usuário, sob a ótica da Teoria Unificada de Aceitação e Uso da Tecnologia (UTAUT), no Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG). **Metodologia/abordagem**: a tipologia de pesquisa é causal, quantitativa, qualitativa e um estudo de caso, por meio da aplicação de questionários a docentes e técnicos administrativos. A análise quantitativa dos resultados evidencia as percepções dos usuários, através do Coeficiente de Alpha de Cronbach e validação dos constructos por Ranking Médio dos itens dentro de cada bloco do questionário aplicado. **Originalidade/relevância**: trata-se de um estudo original por buscar compreender o desempenho individual associado a aceitação de um software de gestão acadêmica, por meio de uma teoria já consolidada (UTAUT). **Principais resultados**: os resultados mostram que a aceitação e o uso do sistema SIGAA exercem efeito significativo no desempenho individual do seu usuário, mas não é algo excepcional, visto que o sistema é uma ferramenta imposta para uso e que facilita a operacionalidade dos registros. **Contribuições teóricas**: o modelo resultante desta pesquisa, com a inclusão do constructo desempenho ao UTAUT, se faz uma contribuição teórica e metodológica para outras pesquisas com esta mesma finalidade. **Contribuições para a Gestão:** O estudo trouxe sugestões de possíveis melhorias a serem implementadas nos sistemas de gestão de atividades acadêmicas, dada a sua importância para as instituições de ensino.

Palavras-Chave: Sistema Integrado de Gestão; SIGAA; UTAUT, Desempenho Individual; Instituições de Ensino.

RESUMEM

Objetivo: analizar si la intención y el uso del Sistema Integrado de Gestión de Actividades Académicas (SIGAA) tienen un efecto positivo en el desempeño individual de los usuarios, desde la perspectiva de la Teoría Unificada de Aceptación y Uso de la Tecnología (UTAUT), en el Centro Federal de Educación Tecnológica de Minas Gerais (CEFET-MG). **Metodología/enfoque**: la tipología de la investigación es causal, cuantitativa, cualitativa y de estudio de caso, mediante la aplicación de cuestionarios al personal docente y a los técnicos administrativos. El análisis cuantitativo de los resultados muestra las percepciones de los usuarios a través del Coeficiente Alfa de Cronbach y la validación de los constructos mediante la Clasificación Media de los ítems dentro de cada bloque del cuestionario aplicado. **Originalidad/relevancia**: se trata de un estudio original ya que busca comprender el desempeño individual asociado a la aceptación de software de gestión académica, utilizando una teoría ya consolidada (UTAUT). **Principales resultados**: los resultados muestran que la aceptación y uso del sistema SIGAA tiene un efecto significativo en el desempeño individual de su usuario, pero esto no es excepcional, dado que el sistema es una herramienta que se pone a disposición para su uso y facilita el funcionamiento de los registros. **Contribuciones teóricas**: el modelo resultante de esta investigación, con la inclusión del constructo rendimiento en la UTAUT, supone una aportación teórica y metodológica a otras investigaciones con el mismo propósito. **Contribuciones teóricas**: el modelo resultante de esta investigación, con la inclusión del constructo desempeño en la UTAUT, hace una contribución teórica y metodológica a otras investigaciones con el mismo propósito. **Contribuciones a la gestión**: el estudio proporcionó sugerencias para posibles mejoras a ser implementadas en los sistemas de gestión de actividades académicas, dada su importancia para las instituciones de enseñanza.

Palabras clave: Sistema Integrado de Gestión; SIGAA; UTAUT, Desempeño Individual; Instituciones de Enseñanza.

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2

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention,
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■ INTRODUCTION

Public institutions need information systems and integrated institutional systems to facilitate the management of documents generated during the operational processes of their management. Over time, the use of new Information System (IS) technologies and digitalization has allowed the transfer of physical documents to a virtual environment using new system tools and mechanisms to meet organizational needs (Sprague, 1995).

This renewed form of accessibility to information has brought innovation to IS and led to changes in administrative, financial, and even educational processes, including changes in their preparation and operational procedures. Transformations can be evidenced by the transition from physical means to virtual means, with the implementation and use of new technologies allied to Internet use (Abrucio & Gaetani, 2005).

In the Brazilian academic environment, information and communication technologies have facilitated the transfer and processing of documents and processes produced by the administrative and financial sectors, formerly in physical form but today transferred to digital platforms. The Information and Communication Technologies (ICTs) in academic environments have been correlated to the management systems to support decision-making and improve university management, inherent to administrative, financial, and academic activities (Bernardes & Abreu, 2004).

Many student institutions have implemented and used the Integrated Management System (IMS) to keep their records safe, improve management processes, computerize and modernize operational procedures, and bring agility, transparency, and savings of financial resources to the government coffers (Centro Federal de Educação Tecnológica de Minas Gerais, 2017).

A cut is made in the IMS system to execute the research proposed by this paper, and the study aims to analyze only one of its modules: the SIGAA, whose diagnosis will be made through the constructs of the UTAUT Theory model (Venkatesh et al., 2003).

Therefore, for the development of this paper, the following research problem is presented with the question: "Does the acceptance and use of the Integrated System for the Management of Academic Activities (SIGAA) have a positive effect on individual performance, at the Federal Center for Technological Education of Minas Gerais (CEFET-MG), from the perspective of the Unified Theory of Acceptance and Use of Technology (UTAUT)?"

We aim to verify how the SIGAA system users in the institution Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG) perceive its implementation in developing their daily activities in the document management system and, consequently, the individual performance obtained from its use.

This research aims to highlight one more point of view on the convergence of the themes: "UTAUT" plus "Academic Management System" combined with "Individual Performance."

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
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3

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
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◼ THEORETICAL BACKGROUND

This section highlights the theoretical basis on which the theme of this work is based.

Information System (IS)

The use of information technology allied to the administration of academic activities implies a better performance of the processes; therefore, the procedures of the academic area have been computerized, making the internal work more effective with an upgrade in the provision of services, greater participation of users, fostering the democratic process and showing more transparency to the activity performed. The IS has become indispensable in the various sectors of educational institutions, motivated by the search for optimization and speed in academic processes (Lima et al., 2016).

ICTs have been used to achieve organizational goals and objectives such as improving the quality of public services, striving for lower operating costs, and serving the community at large (Przeybilovicz et al., 2018).

Management Information Systems

According to Malanovicz (2018), a management information system is essential in an institution by analyzing usage conditions that this system provides to its users. For this perception, the benefits brought by the system are considered, such as access to the most different levels of information recorded and manipulated and data alignment and sharing in favor of the organization's objectives and goals.

Currently, the interaction between IS and technologies is relevant so that they jointly perform a timely execution of operational activities, providing the institution with: outlining new goals; performing more grounded strategic planning; optimizing the time of the activities to be performed; and providing managers with a macro view of all their processes and paperwork (Batista et al., 2019).

Integrated Management System (IMS) Applied to Education

The use of information systems (IS) has been spreading and asserting itself in student organizations, improving the flow of all information, generating effective reports for decision making, and being in charge of collecting, processing, storing, and storing distributing data and information. However, it is relevant to emphasize that the IS involves a certain complexity since, often, there is difficulty standardizing the processes due to the singularity of each institution (Brito & Tonelli, 2019). Another factor to consider is the users' lack of operational knowledge for using the tool and any individual limitations for its deployment; these are obstacles that can stymie IS implementation in institutions.

According to Omelczuk and Stallivieri (2019), the introduction of ICTs in educational institutions was of great value to improve crucial points, such as knowledge and information management. Therefore, CEFET-MG imple-

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

4

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)**

mented the SIGAA to improve and streamline the execution of operational and academic activities of its users.

SIGAA can be explained as a timely and useful IS for the administration because, with the monitoring of academic tasks, it allows for managing students and administrative information inside and outside the institution. This system runs on a virtual environment platform, requiring an internet connection for its operation, aimed at optimizing physical and human resources and minimizing material and financial resources (Souza & Monteiro, 2015).

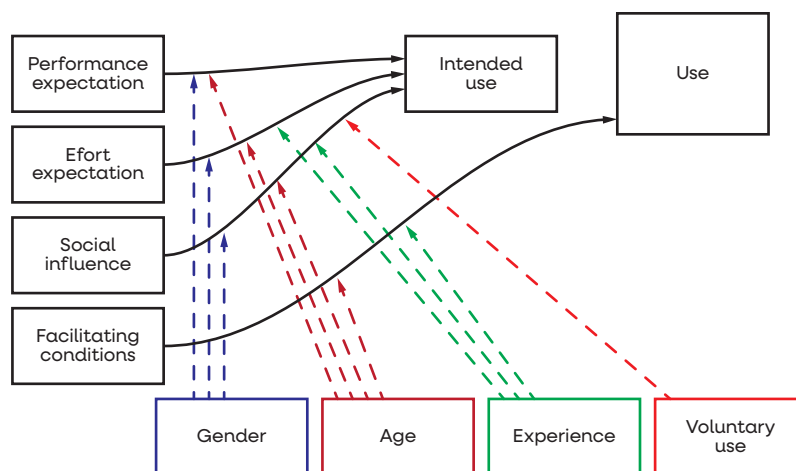## Unified Theory of Technology Acceptance and Utilization – UTAUT

According to Venkatesh et al. (2003), UTAUT is a technology acceptance model developed to interpret user intentions to use an IS and their usage behavior.

According to Batista et al. (2019), this theory has four determining constructs and four moderating conditions for its acceptance and intention to use information technology in an organization. The determinant constructs are identified as follows: the Performance Expectation (PE), the Effort Expectation (EE) for use, the Social Influence (SI), and the Facilitating Conditions (FC). The moderator constructs are gender, age, experience, and willingness to use by users.

In theory, it appears for this study that not all moderating variables are correlated with the determining variables, as gender and experience are correlated with PE, EE, and SI; age correlates with all determinant constructs, PE, EE, SI, and FC; and voluntariness of use only applies to SI. See the model shown in Figure 1 below:

Figure 1

A Model of Unified Theory of Acceptance and Technology Use (UTAUT)

Note. Adapted from Venkatesh et al. (2003).

To develop this work, the UTAUT Theory is used to diagnose the intention and effective use of SIGAA, adding the measurement of individual performance seen from the perspective of its users.

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

5

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

Performance Measurement

According to studies by the authors (Pace et al., 2003), evaluating performance measurement in educational environments has been a great challenge. Numerous factors contribute to this: the type of relationship between the evaluator and the evaluated; lack of standardization and centralization of procedures; lack of participation of the evaluated in terms of giving suggestions for improving the system; and unpreparedness of evaluators to manipulate the evaluation. In the public environment, the inefficient result of such a measurement can bring individual demotivation and reduced productivity to those who work with IS. That is why the evaluation act must be serious, fair, and neutral, always trying to preserve the impartiality of the action.

Among the challenges to achieving positive performance in performing tasks with implementing new ICTs, some points are observed: fulfillment of tasks on time; educated servers; search for quality and time optimization; perception of gains and losses arising from organizational changes that may occur. These factors, among other aspects, can affect the performance of the intended use and the effective use of the system (Cavalcante et al., 2018).

For developing this research, the concept of Individual Performance (IP) is used, and for this study, IP will be considered a set of actions that are performed seeking to achieve the organizational objectives for a certain task to be accomplished (Neely et al., 1995).

In this context, allied to the UTAUT, the IP has as an object to be evaluated the result of the individual's work. It is a great institutional challenge to align the real interests of the institution with its users' interests (Hanashiro et al., 2007).

Visualizing servers' performance is interesting for organizations as it can directly impact the organization's overall development. In Bendassolli's (2017) view, the group of actions that constitute performance measurement may be subordinated to an interpretation imposed by the specific goals to be achieved by each institution.

Therefore, it is important to know what individual performance is provided due to the intention and use of SIGAA from the perspective and interpretation of those using it.

UTAUT theory allied to the Performance construct applied to the use of an IS

According to Zhu et al. (2003), managers are interested in knowing how the use of technological systems in public administration is perceived, and it would be the same in the academic environment. Therefore, the UTAUT allied to the performance construct applied to the use of an IS is worth analyzing.

When an IS is adopted, an expectation is created that it will be used in a non-complex, simplified, and satisfactory way, with benefits for the performance of the work to be performed (Batista et al., 2019). For this reason, it is necessary to recognize and interpret the information that acts as a facilitator in the introduction phase of the system in the same way that it helps point out the bottlenecks that may arise in its implementation and execution process. Questioning potential users about the use and performance of this new technology employed in various organizations are relevant for improving the relationship between execution and service delivery (Silva & Barbosa, 2020).

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

6

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)**
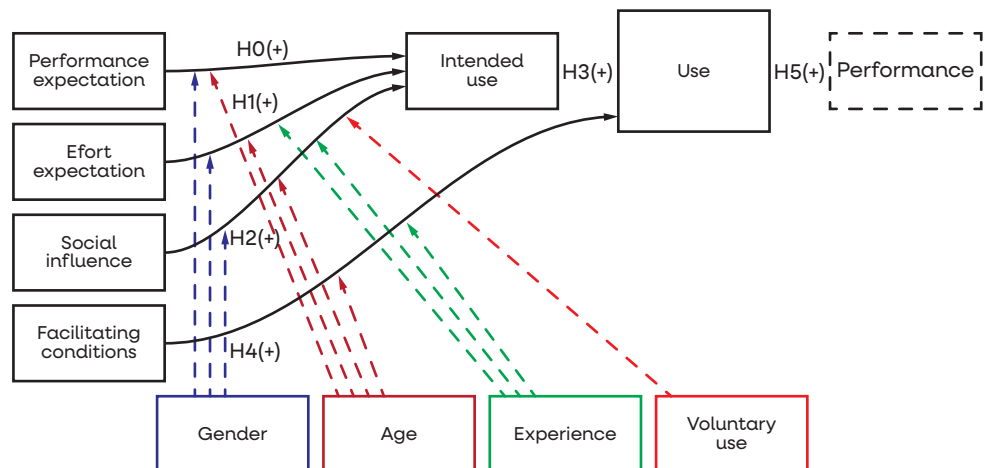
Over the years, the demand for improvement, quality public services, and greater speed has grown. There was a need to reconcile new technologies to manage academic processes in federal educational institutions, considering the expenditure of financial resources invested (Batista et al., 2019). Therefore, an evaluation of the IS tools used in educational institutions should be conducted. It is essential to analyze whether the individual performance, as a consequence of intention and use, adds value to the activity performed, making it successful and whether the use of this work tool is made assertively and consciously. The proposal is then to verify how users of the SIGAA system at the institution Centro Federal de Educação Tecnológica de Minas Gerais (CEFET-MG) perceive its implementation in the development of their daily activities in the document management system and, consequently, the individual performance obtained with its use.

Proposed Hypothesis Model

Associated with the existing constructs to give more perception to the diagnosis of SIGAA intended use and effective use, we added the construct "performance" to the UTAUT theory to verify the results from the understanding of the use of the system by its users in CEFET-MG. This way, we present Figure 2:

Figure 2

UTAUT integrated model plus Performance construct

Note. Adapted from Venkatesh et al. (2003).

Therefore, the hypotheses to be analyzed for developing and executing this work are detailed as follows:

Performance Expectation (PE)

Many studies using the UTAUT model evidenced that the PE factor was shown to have a significant impact on the intention to use IS (Afonso et al., 2012; Ayaz & Yanartaş, 2020; Mutaqin & Sutoyo, 2020; Rabaa'i, 2017). This shows that Performance Expectancy was found to be a strong predictor of the intention to use IS, in line with the acceptance of previous studies.

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

7

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

Performance Expectancy means that users accept the SIGAA for its usefulness, as it makes the process faster, increases productivity, and generally enhances the performance of operational activities performed. The knowledge can measure PE in terms of benefits of using SIGAA services: saving time spent on the activity; easier communication between government agencies and users; improved quality of services provided; and access without distinction for users and citizens to make service requests in different institutions. Employees have access to manuals and videos about the system, which help them to better understand its usability. Based on this, the following hypothesis is presented:

H0 - Performance expectancy has a positive effect on usage intention.

Effort Expectation (EE)

Some authors (Marchewka & Liu, 2007) state that this expectation can significantly determine its operator's intention to use different technological information systems. For authors Carter and Belanger (2004), the effort expectancy measures a system's interface design, ease of use, flexibility, and ease of learning. Therefore, the intention of using the SIGAA is expected to be effortless.

In this study, EE is related to the extent to which the institution's employees believe in the ease of use of SIGAA, demanding minimal effort for its handling and an uncomplicated way of learning to use the electronic service. Based on this, the following hypothesis is presented:

H1 - Expectation of effort has a positive effect on usage intention.

Social Influence (SI)

Social persuasion, such as opinions of friends, colleagues, or superiors (Afonso et al., 2012; Ayaz & Yanartaş, 2020), causes repercussions on users' behavior. It is believed that, in some cases, people may use a particular IS only to fulfill other people's orders rather than follow their instincts (Sternad & Bobek, 2013). Findings from many scholars (Afonso et al., 2012; Ayaz & Yanartaş, 2020; Kabra et al., 2017; Zhu et al., 2003) suggest that Social Influence is an important determinant of this behavior.

In many studies using the UTAUT model, the IS factor has been shown to impact usage intention significantly. Therefore, in this research, we will analyze how users' opinions can affect the adoption of SIGAA at the institutional level. The following hypothesis is presented:

H2 - Social influence has a positive effect on usage intention.

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

8

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

The link between usage intent and effective usage

The following hypothesis is aligned with the verification of the congruence of the constructs: performance expectancy, effort expectancy, and social influence that act on the intention to use, in order to verify the effect on the effective use of the implemented technology. For this, we will have the following hypothesis:

H3 - Usage intent has a positive effect on the effective use.

Facilitating Conditions (FC)

The facilitating conditions analyze the simplicity or difficulty of developing a certain activity or the possibility of changing behavior when faced with a situation (Ajzen, 1991).

According to Venkatesh et al. (2003), the facilitating conditions can reflect the users' ability to use the IS. Therefore, the UTAUT will analyze the possibility of facilitating conditions that benefit the system used at CEFET-MG. The facilitating conditions are related to the existence of information and manuals available to help use SIGAA correctly, to receiving assistance and resolving doubts in the event of difficulties using the system. For this, the following hypothesis is presented:

H4 - The facilitating conditions have a positive effect on effective use.

Performance

Scholars understand that the result of the performance measurement study can influence the behavior of an organization positively or negatively because research indicates that there is no exact measure that can induce a clear performance target. Several variables can compromise the indicators present in the organizational environment. Therefore, for this analysis, relying on a single construct may lead to a misdiagnosis of the institution's current situation (Kaplan & Norton, 2005).

Therefore, to give more robustness to the research throughout this work, we associate the performance construct with the independent constructs to increase academic interest in this work and provide a new line of verification as to the result of the SIGAA use. In this context, the following hypothesis is presented:

H5 - The system's use has a positive effect on performance.

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

9

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

■ METHODOLOGICAL PROCEDURES

The case study is the methodology used quantitatively and qualitatively with data collection using a questionnaire sent to CEFET's-MG teaching and administrative staff, without distinction. Additionally, interviews will be carried out later with a small group of employees to provide qualitative evidence of the quantitative findings.

The execution of this research has a causal research profile. This research analyzes when the variation of a factor influences other factors' variations, i.e., this type of research aims to explain the cause and effect link between the studied variables (Barquette & Chaoubah, 2007).

The methodology employed is quantitative, a procedure used to quantify information collection and measure the predetermined variables to verify and explain their influence on other variables (Godoy, 1995), allowing one to determine whether they will confirm or challenge the initial hypotheses. Subsequently, another approach to the problem is through qualitative analysis, where some respondents are summoned to answer the questionnaire orally, and based on their answers, the ideas that will be found are conceived.

Finally, the analysis results are exposed in tables extracted from the empirical research. These tables show the respondents' perceptions of the questioned subject, leading us to the theme of this work.

According to the latest count, recorded until July 2021, as described in the Report of the People Management Secretariat SEGEP/CEFET-MG (2021), the institution has around 1,740 active civil servants on its staff, of which 1,083 are professors and 657 are administrative technicians. In this scenario, a questionnaire was applied to all active teaching staff and administrative technicians, i.e. those who are working at the institution, with no distinction between them.

The sample definition is confirmed by the formula below:

$$n = \frac{N \cdot Z^2 \cdot p \cdot (1 - p)}{Z^2 \cdot p \cdot (1 - p) + e^2 \cdot (N - 1)}$$

Note. n – calculated sample; N - population; Z - standardized normal variation associated with the confidence level; p - true probability of the event; e - sampling error.

The sample indicated a minimum total of 315 respondents. This number refers to a slice of the population, representing a specific group that corresponds to the target audience's perception of understanding the whole's behavior without the need for the entire active server population to answer the forwarded questionnaire. This way, we seek to obtain 95% confidence and a 5% margin of error (Stevenson, 2001).

The questionnaire was developed using the Google Forms tool and applied from December 3, 2021, to January 25, 2022. It was structured into blocks of questions, where from the first to the fourth block, the factors related to the intention of accepting the use of information systems based on the UTAUT were considered, and the last block, complementing the research arguments, considers the questions relevant to the construct Individual Performance.

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

10

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)**

Figure 3

Proposed Research Instrument

Independent Constructs		Assertions	Authors
Performance Expectation	Shows the degree of expected contribution to job performance	PE1. I consider SIGAA to be useful for carrying out my work.	Afonso et al., (2012); Ayaz & Yanartaş, (2020); Mutaqin; Sutoyo, (2020); Rabaa'i, (2017)
		PE2. Using SIGAA allows me to finish assignments faster.	
		PE3. Using SIGAA increases my productivity.	
Effort Expectation	Evidences the perceived ease of use of the system	EE1. In the beginning, I had difficulty using SIGAA.	Ayaz & Yanartaş, (2020); Dwivedi et al., (2011); Kabra et al., (2017); Marchewka & Liu, (2007)
		EE2. Learning to use the system was (is) easy.	
		EE3. For me, SIGAA is clear and understandable.	
		EE4. It is easy to become more skilled in the system use.	
Social Influence	Collective perceptions of system use	SI1. I have colleagues who resist using SIGAA.	Afonso et al., (2012); Ayaz & Yanartaş, (2020); Kabra et al., (2017); Zhu et al. (2003)
		SI2. My superior supports the use and facilities of SIGAA.	
		SI3. The old system (control through physical documentation) was more effective.	
Facilitating Conditions	Belief in the system's support structure	FC1. There is information and manuals available that help me use SIGAA correctly.	Ajzen, (1991); Venkatesh et al., (2003)
		FC2. I can receive assistance and solve doubts about difficulties with SIGAA.	
		FC3. I consider that SIGAA's information and functionalities are reliable.	
		FC4. SIGAA's functionalities are sufficient for carrying out my daily work.	
Individual Performance		IP1. I fulfill the tasks within the established deadlines.	Pace et al. (2003)
		IP2. I receive feedback for the work I do.	
		IP3. I am guided to do tasks different from the ones I usually do.	
		IP4. I look for new ways to perform the activity, aiming at quality and time reduction.	
		IP5. I am effective in meeting the tasks and goals set by my boss.	

Moderators	Questions	Authors
Sex	Male or Female (Closed-ended question)	Venkatesh et al., (2003)
Age	Numeral (Open-ended question)	
Experience	Education (Closed-ended question) Time of experience in the agency (Closed question) Experience with systems and information technology (Closed question)	
Voluntary Use	Not applicable, since using SIGAA is not optional.	

Note. Adapted from Batista et al. (2019).

The reliability of the items within the construct is measured through Cronbach's Alpha coefficient, which Lee J. Cronbach (Cronbach, 1951) described as an important statistical tool disseminated in several surveys. According to Shavelson (2009), this coefficient is useful for a few reasons: a) It provides

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

11

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

a reasonable measure of reliability in a single test, eliminating the need for unnecessary repetitions or parallel applications of another test to estimate its consistency; b) its general formula allows its application in multiple-choice questionnaires; and c) it is easily calculated using basic statistical principles.

Each assertion in the table is categorized by a Likert-type scale, where respondents explicitly state their degree of agreement or disagreement with each of them (Malhota, 2012).

Table 1

Instrument Valuation

Response	Qualitative variable	Quantitative variable
Totally disagree	Very Low	1
Partially Disagree	Low	2
Neither Agree nor Disagree	Neutral	3
Partially Agree	High	4
Strongly Agree	Very High	5

With the data collected after analysis, according to the Likert scale classification, it was possible to identify the perception of SIGAA users; identify the individual performance obtained in the execution of activities using SIGAA; analyze acceptance of the use of SIGAA; list possible improvements to increase acceptance and use of the SIGAA system by CEFET-MG employees.

To analyze and process the data, we initially used structural equation modeling, which is a method applied as a form of multivariate statistics when multiple variables are to be analyzed together. It allows theory to be developed and constructs to be generated from latent variables, i.e. this method can be applied to evaluate variables that are difficult to measure and can be grouped from a set of items, the aim of which is to understand an existing reality (Alexandre & Neves, 2018).

It is important to note that the reference work endeavored to use the structural equation for a possible sample of at least 315 respondents; however, due to bottlenecks encountered during the questionnaire application process, it was possible to collect responses from 291 respondents, so in view of the data that was collected, the type of analysis previously planned was not possible.

In order to explain what was done, the variables were first subjected to a descriptive analysis of all the items evaluated to gain a better understanding of their behavior.

In order to understand the findings more comprehensively, the frequency tables show the sociodemographic variables and the age of the participants, which is shown by the mean and standard deviation.

In order to identify the findings, the correlation of each item with its construct needs to be at least 0.5 (Hair, 2008) otherwise, the suggestion is that the item will be removed as it does not meet the technique's explanation requirements. If it is not removed, its results need to be evaluated with

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

12

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

caution as they may contain some kind of bias derived from the interviewee's lack of knowledge on the subject.

The reliability of the items within the construct is measured through the Cronbach's Alpha Coefficient, which identifies whether the questions were in fact understood and the instrument is reliable. The expected value is at least 0.7.

After validating the items, the Average Ranking (AR) establishes which items are more or less important within each construct. The ranking formula is as follows:

$$AR = \frac{(Freq\ resp\ 1 \times 1) + (Freq\ resp\ 2 \times 2) + (Freq\ resp\ 3 \times 3) + (Freq\ resp\ 4 \times 4) + (Freq\ resp\ 5 \times 5)}{total\ responses}$$

Through AR, the average score achieved by the item will be classified according to the following criteria: Values greater than 3 indicate agreement; values less than 3 indicate disagreement; and values equal to 3 indicate indifference, no opinion, or no response.

■ PRESENTATION AND ANALYSIS OF THE RESULTS

Today, SIGAA has numerous administrative and academic tasks in its functionality. Most of its internal and external users, stakeholders in the institution, can perform various activities such as monitoring and processing processes, human resources services, asset management, and contracts.

Firstly, a descriptive analysis is presented to explain the size of the public and the composition according to the sociodemographic questions raised. The questionnaire was initially answered by 291 (two hundred and ninety-one) participants. However, 65 (sixty-five) replied that they did not use SIGAA and were therefore excluded from the survey. Although SIGAA is available to all employees, some do not need to use the system because their activities do not require the management of academic activities, only administrative ones. In the end, the results show exactly 226 (two hundred and twenty-six) valid respondents.

RCA *Revista de Ciências da Administração*

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

13

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

Table 2

Frequency of the sociodemographic variables, n = 226

Use of SIGAA on a voluntary basis	n	%
No	54	23,9
Yes	172	76,1
Gender		
Female	104	46,0
Male	107	47,3
Prefer not to inform	15	6,6
Schooling		
High school	4	1,8
Higher education	31	13,7
Postgraduate (specialization)	58	25,7
Postgraduate (Master's)	63	27,9
Postgraduate (PhD)	70	31,0
Length of time in the Agency		
Less than 1 year	4	1,8
Between 1 and 5 years	26	11,5
Between 5 and 10 years	106	46,9
More than 10 years	90	39,8
Time of experience with systems and computing		
Between 1 and 5 years	7	3,1
Between 5 and 10 years	49	21,7
More than 10 years	170	75,2

Of the valid respondents, it is evident that voluntary participation in the use of the SIGAA was reported by 76.1% of the participants. There was a sex balance, with 47.3% representing men and 46% representing women. Of the respondents, most (84.6%) have some postgraduate level: specialization, master's, or doctorate. 13.7% of those who responded had a higher education, while the smallest proportion (1.8%) had only secondary education.

Regarding the length of time worked for the agency, 39.8% have more than ten years, while only 1.8% have less than one year. As for the amount of experience with systems and information technology, the majority (75.2%) have more than ten years of experience. Respondents' minimum age is 22 years of age, and the maximum is 62 years; therefore, the average age of the respondents is 43.7 years, with a standard deviation of 9.6 years.

After evaluating the conditions of the public respondents, structural equations are analyzed to evaluate whether all items asked in the questionnaire are, in fact, part of the proposed constructs, describing the main trends of the existing data.

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

14

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)**

Table 3

Correlation of the items with their respective factors through structural equations and Cronbach's Alpha

Constructs	PE	EE	SI	FC	IP
PE1. I consider SIGAA to be useful for carrying out my work.	0,805				
PE2. Using SIGAA allows me to finish assignments faster.	0,959				
PE3. Using SIGAA increases my productivity.	0,954				
EE1. In the beginning, I had difficulty using SIGAA.		0,585			
EE2. Learning to use the system was (is) easy.		−0,815			
EE3. For me, SIGAA is clear and understandable.		−0,934			
EE4. It is easy to become more skilled in the system use.		−0,766			
SI1. I have colleagues who resist using SIGAA.			0,588		
SI2. My superior supports the use and facilities of SIGAA.			−0,319		
SI3. The old system (control through physical documentation) was more effective.			0,360		
FC1. There is information and manuals available that help me use SIGAA correctly.				0,785	
FC2. I can receive assistance and solve doubts about difficulties with SIGAA.				0,812	
FC3. I consider that SIGAA's information and functionalities are reliable.				0,878	
FC4. SIGAA's functionalities are sufficient for carrying out my daily work.				0,849	
IP1. I fulfill the tasks within the established deadlines.					0,590
IP2. I receive feedback for the work I do.					−0,356
IP3. I am guided to do tasks different from the ones I usually do.					−0,478
IP4. I look for new ways to perform the activity, aiming at quality and time reduction.					0,483
IP5. I am effective in meeting the tasks and goals set by my boss.					0,713
Alpha de Cronbach	**0,923**	**0,841**	**0,349**	**0,900**	**0,564**

According to Cronbach's Alpha Coefficient, Table 3 presents the correlations of each item with its corresponding construct, allowing us to identify that the items belonging to the Social Influence construct (0.349) and the Individual Performance items (0.564) have low reliability. The results should be read cautiously to avoid erroneous conclusions from the answers given in both cases.

Table 4 shows the calculations of the average ranking of the items, and the items belonging to the SI and IP constructs that had correlation values with a factor lower than 0.5 (positive or negative) are highlighted as they did not show reliable results.

RCA · Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

15

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)**

Table 4

Calculation of Average Ranking

	Frequency of responses					AR (Average Ranking)
	1	**2**	**3**	**4**	**5**	
PE1. I consider SIGAA to be useful for carrying out my work.	3	2	11	40	170	4,65
PE2. Using SIGAA allows me to finish assignments faster.	3	12	23	40	148	4,41
PE3. Using SIGAA increases my productivity.	6	16	27	34	143	4,29
EE1. In the beginning, I had difficulty using SIGAA.	86	42	26	43	29	2,50
EE2. Learning to use the system was (is) easy.	4	19	36	58	109	4,10
EE3. For me, SIGAA is clear and understandable.	9	25	34	64	94	3,92
EE4. It is easy to become more skilled in the system use.	6	12	40	66	102	4,09
SI1. I have colleagues who resist using SIGAA.	111	20	41	35	19	2,25
SI2. My superior supports the use and facilities of SIGAA.	**4**	**5**	**65**	**28**	**124**	**4,16**
SI3. The old system (control through physical documentation) was more effective.	**181**	**21**	**12**	**5**	**7**	**1,39**
FC1. There is information and manuals available that help me use SIGAA correctly.	12	19	35	35	125	4,07
FC2. I can receive assistance and solve doubts about difficulties with SIGAA.	13	24	39	42	108	3,92
FC3. I consider that SIGAA's information and functionalities are reliable.	5	15	29	44	133	4,26
FC4. SIGAA's functionalities are sufficient for carrying out my daily work.	17	18	19	46	126	4,09
IP1. I fulfill the tasks within the established deadlines.	0	2	8	26	190	4,79
IP2. I receive feedback for the work I do.	**119**	**21**	**35**	**32**	**19**	**2,16**
IP3. I am guided to do tasks different from the ones I usually do.	**128**	**18**	**49**	**17**	**14**	**1,99**
IP4. I look for new ways to perform the activity, aiming at quality and time reduction.	**3**	**2**	**19**	**50**	**152**	**4,53**
IP5. I am effective in meeting the tasks and goals set by my boss.	0	0	9	38	179	4,75

Analyzing the score found in the above RM table, we have the following situation:

In Performance Expectation, the three items agree, and the ranking follows the order of the items: PE1, PE2, and PE3, as they achieved scores greater than 3. This result underscores the perceived utility of SIGAA system in facilitating task completion and enhancing productivity, as evidenced by participants' responses. Overall, these results underscore the positive impact of SIGAA on work efficiency and effectiveness, indicating its value as a valuable tool in academic or professional settings;

In the Effort Expectation findings, only item EE1 had respondents indicating disagreement with the statement. It is a good result because it shows that people had no difficulty with the system. They believe that using SIGAA is easy, requiring minimal effort for its handling. Participants expressed that learning to use SIGAA was straightforward, with subsequent items highlighting its clarity and ease of mastery. This suggests that users perceive minimal effort

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

16

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

is required to navigate and utilize SIGAA effectively. Such findings underscore the system's user-friendly design and contribute to a favorable outlook on its usability among stakeholders;

Among the Social Influence items, only SI1 indicated disagreement with the statement, and it can be concluded that the resistance was not true. Due to Cronbach's alpha coefficient being < 0.5, the other items were discarded. While only one item, SI1, warranted analysis due to respondents' disagreement with the statement about colleagues' resistance to SIGAA, it suggests a lack of substantial resistance within the organizational context. However, the exclusion of other items due to a Cronbach's alpha coefficient below 0.5 highlights the need for further examination or refinement of these measures. Moving forward, addressing any potential discrepancies in perceptions and fostering greater support for SIGAA among colleagues and superiors could contribute to its successful integration and utilization within the organization;

All Facilitating Conditions items had agreeing mean scores, with the highest scores for FC3 followed by FC4, FC1, and finally FC2. Therefore, the conditions reported above reflect positively the user's ability to use the IS. Particularly noteworthy is the high score attributed to FC3, which underscores users' confidence in the reliability of SIGAA's information and functionalities. Furthermore, the acknowledgment of SIGAA's sufficiency in facilitating daily work tasks, as reflected in FC4, reinforces the system's effectiveness in meeting users' needs. Overall, these results highlight the importance of a robust support structure in facilitating users' interaction with information systems like SIGAA, ultimately contributing to enhanced usability and user satisfaction;

Regarding Individual Performance, three of the five items (IP2, IP3, and IP4) are not reliable because they had a low correlation with the construct, with Cronbach's Alpha Coefficient < 0.5 discarded. Through the analysis of items IP1 and IP5, the former scores higher. Particularly notable is the higher score attributed to IP1, indicating a strong self-assessment of task completion within established deadlines. Furthermore, the acknowledgment of effectiveness in meeting tasks and goals set by superiors, as reflected in IP5, underscores employees' confidence in their ability to fulfill job responsibilities. These findings highlight the importance of timely task completion and goal attainment in assessing individual performance, providing valuable information for organizational evaluation and improvement strategies.

However, it is important to stress that the use of SIGAA by the institution's servers is mandatory. Therefore, accepting and using this system does not impact users' performance, although the respondents agree with this proposition, given the results of items IP1 and IP5.

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

17

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

■ FINAL REMARKS

Given the results found, it is concluded that we have the following directions for the hypotheses:

- ■ **H0**, in the evaluation of the performance expectation having a positive effect on the intention to use, can be considered yes, because its findings were positive;
- ■ **H1**, where it is verified whether the effort expectation had a positive effect on the intention to use, in general, it was perceived that the effect was positive because its users do not spend much effort regarding the use of the system;
- ■ **H2**, which examines whether social influence had a positive effect on the intention to use, this hypothesis was refuted since its use is imperative and forced to perform academic and administrative tasks;
- ■ **H3**, where it is evaluated whether the intention to use has a positive effect on the effective use, following the logic for H2, this hypothesis is refuted because there is no intention to use. Its application is linked to the assignment of academic and administrative management;
- ■ **H4**, which analyzes whether the facilitating conditions had a positive effect on effective use, the result was positive according to the Average Ranking achieved, as it verifies that the user has a virtual environment that allows him to use the system; and
- ■ **H5**, where it is verified whether the use of the system had a positive effect on performance, according to the questionnaire, it is noticed that the system is in a cast, as there is no flexibility or autonomy for the user, which, in a way, does not make the individual performance something notable or possible. However, SIGAA continues to be adopted because it is the institution's main academic management system.

In order to better substantiate the results collected in the survey conducted via institutional e-mail, there was an attempt, via telephone, to interview a group of servers to verify the quantitative findings qualitatively. However, as many of the active employees, teachers or administrative technicians, and possible users of SIGAA were on vacation, only ten (10) were available to answer.

According to the feedback from some respondents, there is also a critical view of the system. Some judge it as terrible, poorly designed, and not intuitive since, for some activities to be performed, it is not objective, causing users to waste too much time on their tasks.

Some respondents cited the following as specific considerations: the statistical tools do not work satisfactorily; students complain of errors in the time it takes to close the online questionnaires; there is a limitation on the number of columns for the entry of evaluations; there is no possibility of the information on the partial total of the grades before consolidating the journal; and the system is unstable, sometimes becoming inoperable.

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

18

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

The following considerations are presented to answer the general objective of this research:

a) **Regarding the identification of users' perceptions related to the use of SIGAA,** it could be observed that many users consider it useful for carrying out work, as it allows for greater dissemination and speed in the processing of information, but it could be a more instructive tool with more functionalities.

b) **As for identifying the individual performance obtained in the execution of activities using SIGAA,** the findings through the data collected in the surveys did not provide an objective conclusion. It is noticed that some questions asked of the respondents were not clearly explained, leaving a dubious interpretation of the questions and the answers collected. An alternative to this limitation would also be to conduct in-depth interviews with users of the system from different administrative categories.

c) **Regarding the analysis of acceptance of the use of SIGAA by its users,** as it is an imposing tool to perform academic and administrative records, there is no alternative for the employee to disagree or be against its use, as it is the tool used in the execution of day-to-day tasks.

d) **As for listing possible improvements to broaden the acceptance and use of the SIGAA system by CEFET-MG servers,** we suggest some measures that can be explored and implemented by managers to improve the system in the future: i. Improve the system commands by optimizing and speeding up the tasks to be performed; ii. Develop feedback from time to time to verify punctual bottlenecks that need adjustments; iii. Develop an interactive manual in the system through self-explanatory links; and iv. Increase support for guidance to users from the institution's community to expand the availability and accessibility of academic information.

Therefore, despite being an imposed tool, we observed that SIGAA is a system that has automated and improved users' and institutions' daily processes, allowing time optimization in the execution of activities; agility in locating and managing processes; integration of internal and external information; more quality and agility in decision-making; and greater transparency of information to the academic community and all interested parties.

Therefore, we can reflect that SIGAA's acceptance and use, in general, has a significant effect on the user's Individual Performance, although it is not exceptional; nevertheless, it is an important system that facilitates the operation of academic and administrative records.

RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

19

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

**Academic activity management system: an analysis from the perspective of intention,
use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)**

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RCA **Revista de Ciências da Administração**

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

20

• Danilo de Melo Costa • Eliana Márcia Martins Fittipaldi Torga • Flávia de Paula Dias

Academic activity management system: an analysis from the perspective of intention, use and performance at the Centro Federal de Educação Tecnologica de Minas Gerais (CEFET-MG)

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RCA Revista de Ciências da Administração

Revista de Ciências da Administração, Florianópolis, v. 26, n. 66, p. 1-25, 2024
Universidade Federal de Santa Catarina. ISSN 2175-8077

21

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22

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23

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24

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25