## Shared Service Centers as a Tool for Intellectual Capital Management

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Keywords: Shared Service Center, Organizational Knowledge Management, Intellectual Capital Management, e-Business.

Abstract: In the search for organizational models to improve quality, efficiency and effectiveness, we are faced with the paradigm of Shared Service Centers (SSC) and Intellectual Capital Management (ICM). SSC have demonstrated great success in organizational management and ICM is considered one of the most important assets for the survival of organizations. In a public administration context, the challenge has been to demonize - to state that these two realities can bring benefits to the organization and leverage a process of change. The present study was developed with the objective of recognizing Factors that Benefit and Factors that Discourage the implementation of a SSC and, in addition, it was studied how the SSC can enhance the ICM in the analysed institution.

With a positivist epistemological positioning and a quantitative and qualitative methodological approach, the case study method was applied. Empirical data were collected through document analysis and a questionnaire survey. From the data collected, the internal consistency of the indices was analysed, using the Cronbach Alpha coefficient, the absolute and relative frequencies for each indicator, the Level of Concordance of the statements and the Pearson correlation between the indicators of each group.

This research also demonstrates that the SSC model in public administration enhances the ICM by improving the quality and gain in efficiency and effectiveness of services provided.

## **1** INTRODUCTION

Nowadays, when changes occur quickly and continuously to meet internal and external demands, managers must be attentive to business models that produce efficiency and effectiveness in processes.

The institution researched was a Medium and Higher education institution located in the Mining Triangle State in Brazil, is a public school of the Federal Government, linked to the MEC - Ministry of Education and Culture. This Institution originated from the fusion of old schools, which became a Campus of this new one; later, from its enlargement with the creation of other college campus, linked to a Rectory.

In the search for organizational models, we come across the paradigm of Shared Service Centers - SSC,

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which uses the sharing of support functions. Thus, this work has investigated whether the implementation of a SSC can collaborate positively, directly or indirectly in Intellectual Capital Management in the context.

Considering the fact that SSC are an emerging model and still little used, especially in the Brazilian public administration, this study also aims, besides the general and specific objectives defined, to contribute to disseminate this model of service organization, establishing, in a systematized and enlightening manner, knowledge on such an emerging theme, so that public administrators and managers have subsidies to explore an organizational model that aims to improve efficiency and effectiveness in public administration (Pinto, 2015); Schulman, Harmer, Dunleavy, & Lusk, 2001; Quinn, Cooke, & Kris, 2000).

Pinto, A., Costa, E. and Alves, P.

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DOI: 10.5220/0010011201450153 In Proceedings of the 17th International Joint Conference on e-Business and Telecommunications (ICETE 2020) - Volume 3: ICE-B, pages 145-153 ISBN: 978-989-758-447-3

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E-BDT 2020 - Special Session on E-Business and Digital Transformation

The present research was developed with the objective of recognizing Factors that Benefit and Factors that Disadvantage the implementation of a SSC, and, additionally, it was studied how the SSC can enhance the Intellectual Capital Management in the analysed institution.

With an interpretative epistemological positioning and quantitative and qualitative methodological approach, the case study method was applied. Empirical data were collected using document analysis and a questionnaire survey. The questionnaire, in addition to characterizing the sample, has twenty-nine partial indicators, divided into three global indicators that evaluated the Favourable Factors, the Unfavourable Factors and the Indicators of Intellectual Capital Management.

Thus, the question of investigation to which an answer was attempted was:

Can the implementation of a Shared Services Centre collaborate positively, directly or indirectly in Intellectual Capital Management in the context of the Institute of High and Higher Education?

Considering the research in question, it is clear that the implementation of a Shared Services Centre collaborates positively in Intellectual Capital Management in the context of the Institute of Higher Education.

In addition to the introduction presented in the first section, this paper includes the second section presenting the purpose of the study and the state of the art. In the third section the methodological approach is defined and presented. In the fourth section the results are presented, analysed and discussed. In the fifth section the conclusions and future work are presented.

## 2 PURPOSE OF STUDY AND STATE OF THE ART

Theory, With the emergence of Systems organizations and companies began to be seen assuming their systemic nature. In this sense, it was from the study of living beings that the concept of open systems emerged, extending to other disciplines and to Administration, so a system is considered: (i) "a set of elements", which are the components; (ii) "dynamically interrelated", establishing communications and relationships of dependence between them; (iii) "developing an activity or function", this being the process that transforms inputs; (iv) "to achieve one or more objectives or

purposes", which constitutes its purpose (Chiavenato, 1994, pp. 58-59).

Being seen as systemic entities but also as open systems, they influence and are influenced by the environment in which they are inserted (systems and microsystems), so it is not indifferent the management model they adopt.

# 2.1 Management Models and the Shared Service Center

For Correia (2003, p. 3), each organization being a unique business, defining a model in this context is inevitably complicated. Such models must be flexible, adaptable and capable of dealing with the pressures of constant change as well as with the views of experienced managers on how things should be done.

In the shared services model, there is management control in the administration of the business unit, and there may be some influence from the parent company. The revenue of the shared services unit is usually determined by contractual agreements, which guarantee the supply of goods and services of specified quality and quantity. In this case, as in an independent, profit-sharing business operation, employee rewards are based on customer satisfaction.

In this model, increased efficiency, gain in economies of scale, standardization of technology and processes as well as responses to the needs of the group companies are some advantages. The main disadvantages are culture changes for business unit employees, high start-up costs and some duplication in administrative and managerial effort (Bergeron, 2003, pp. 18-19).

Shared Services is a concept based on a collaborative strategy in which selected transversal services, common to several business units of an organization, are concentrated in business units that promote efficiency and effectiveness. It is based on three principles: standardization, consolidation and reengineering, strongly dependent on Information and Communication Technologies (Pinto, 2015, p. 3).

# 2.2 Shared Service Center in Public Administration

Porter (1992) deals with what he calls the value chain, distinguishing primary activities from support activities. He understands that primary activities are those that are part of the core business of the business, being unique and carried out by sectors that have the competence to do so; while support activities can be standardized, not being unique among business units and, therefore, can be shared - Porter also called them support activities. However, according to Pinto (2015, p. 54), although support or support activities are basically transferred to the SSC, this transfer does not rule out the possibility that, in some situations and if there is interest, main or primary activities may be carried out in the same way by the SSC. According to Granjeiro (2000, p. 16), the group of organs and entities, established by the Public Power, State, for the attainment of the common good, is what is called Public Administration.

One of the factors that distinguish private from public administration is in relation to its principles and characteristics, since while private administration is oriented to profit and shareholders' interests, so that the collective interest is served by the market, public administration is explicitly and directly supported for the satisfaction of the public interest.

Public administration is as important as it is complex, whatever the society. Thus, effective public administration can determine development for society; conversely, inefficient or unbalanced public administration, in a short period of time, leads a society from decline to destruction (Wiig K. M., 2000). In this context, the term effectiveness is used because efficient was no longer enough, and there is a need to do efficiently what was paramount; thus, the concept of effectiveness emerges: knowing how to do the right tasks right (Granjeiro & Castro, 2000).

Figure 1 presents the Shared Services Management Model, based in Bergeron (2003).



Figure 1: Shared Services Model.

For Pereira (1996), the federal public administration had three moments: until 1930, Patrimonial State; between 1930 and 1995, Bureaucratic State; and from 1995, Managerial State.

#### 2.3 Intellectual Capital Management

The term "knowledge society" has been highlighted by Drucker (1993) since the early 1990s, when knowledge management gained importance and was considered a success factor for organizations. The author highlights that "today the really controlling resource, the absolutely decisive factor of production, is not capital, land or labour. It is knowledge" (p. 15). Drucker recognizes that "today value is created by productivity and innovation, which are applications of knowledge to work" (p. 16).

Stewart (1998) corroborates this statement, highlighting that knowledge is an intangible asset more important than capital and labour, becoming a generator of wealth; hence the importance of identifying, creating, storing, sharing and applying this good.

Nonaka & Takeuchi (1997, p. 7) explain that knowledge expressed in a clear and objective manner is defined as explicit knowledge, which can be easily communicated in such a way that it can be used systematically and formally, becoming practical and useful knowledge.

As for the intellectual capital of organizations, Edvinsson & Malone (1998) refers to it not only as an intellectual human activity, but also as a context in which intellectual property is included as part of their intangible assets, as well as names, brands, training, technological leadership and all formal knowledge about the organization's employees (p. 197). They also ensure that, for organizations in the knowledge society, what matters in creating value while keeping them attractive and sustainable is intellectual capital.

For Hammer & Champy (1994) management must reinvent itself in order to respond to four problems: the company's objective, its culture, its performance problems and resource management.

As for knowledge, it is the information assimilated by the individual, coming from experience, research, innovation, that is, it happens through the process of understanding information. Davenport (1998, p. 18) states that knowledge is the precious information of the human mind, comprising reflection, synthesis and context, being its structuring and transfer complex.

The other current of literature discusses knowledge as an organizational asset that must be managed in a way that improves organizational performance (Pinto, 2015). A relevant contribution of this current was the introduction of the concept of intellectual capital (CI), which corresponds to the organizational knowledge that was freely applied by the people in favour of the organizations, incorporating and increasing the knowledge retained by them. The objective of supporting managers to identify and classify the components of an organization's intellectual capital. Employee competencies such as their leadership and change management capabilities determine the success of the organization's transformation. The challenge is not only to hire human resources, but also to manage them in an evolutionary way, in accordance with the evolution of the organization itself. Effective HR management has the advantages of tailoring resources to needs, keeping them up to date, involved, and motivated. Keeping a motivated team is one of the key challenges and critical success factors of a Shared Services Center.

## 3 METHODOLOGICAL APPROACH

This section describes the methodology applied to solve the research question and to achieve the objectives determined in the research.

According to Descartes, "The method is the art of guiding reason in the sciences" (Morin, 2005). In this sense, through scientific methodology, the researcher seeks to solve the proposed problem and the objectives of the study, as well as to search for a new perception or truth in relation to a certain studied reality.

#### 3.1 Research Objectives

The research question that guides this work is: "Can the implementation of a Shared Services Center collaborate positively, directly or indirectly in Intellectual Capital Management in the context of the Federal Institute of the Mining Triangle?

This question resulted in the elaboration of the main objective of the research: "to recognize which factors benefit the implementation of a SSC, which factors disfavor this implementation and how the SSC can potentiate the Intellectual Capital Management for the Patrimony Management in the Federal Institute?

#### 3.2 Method

The research question to which this research was intended to answer is: "Can the implementation of a Shared Services Centre collaborate positively, directly or indirectly in Intellectual Capital Management in the context of the Institute?

This research is based on the taxonomy presented by Gil (2002) and Vergara (1998), which typifies it in terms of objectives or ends and procedures or means. Regarding the objectives, this research is considered exploratory and descriptive considering that it intends to describe the perceptions and understandings of managers and administrators, regarding the themes under study.

With regard to procedures or means, the research follows the case study method, supported by bibliography, documentary analysis and analysis of data collected using questionnaire survey.

As for the sample, analysing the assumptions of Lakatos and Marconi (2003) regarding research by means of questionnaires, we have: "On average, the questionnaires sent by the researcher reach 25% of return" (p. 201). Hill & Hill (2002, p. 91) also find it normal that response rates to a questionnaire do not exceed 30%.

Through a questionnaire survey, a total of 263 employees were invited to participate, of which 160 responded; this corresponded to 60.8% of the total number of respondents.

To avoid interference and contact with the researcher, the survey was applied through Google Form, an online platform for collecting survey data.

The SPSS Statistics 17.0 software was used for statistical analysis of the data.

#### **3.3 Data Collection Instruments**

After superior authorization, the participants received, through their institutional e-mail, the link to answer the online questionnaire through an invitation letter to participate in the research as well as the Term of Free and Informed Consent. This document is required in Brazil in investigations involving people.

A two-part questionnaire was used to carry out the research. The first identified the profile of the respondents, gender, age group, schooling, length of service in the Institution, relationship with the sector investigated and whether or not he holds a management position or a gratified position, which represents who the managers or coordinators of the Institution are.

The second part of the questionnaire, based on the existing literature, was divided into three groups of questions: the first group, composed of 12 questions, which sought to know the level of agreement regarding the factors favorable to the creation of an SSC; the second group, with 8 questions, sought to verify the factors unfavorable to this creation and the third group, with 9 questions, sought to identify the aspects related to the management of Intellectual Capital.

Cronbach's Alpha is a coefficient that measures the internal consistency of a questionnaire. Its application in the context of Social Sciences, a coefficient more than 0.90 is considered "very good"; from 0.80 to 0.9 is considered "good"; an internal consistency coefficient between 0.70 and 0.80 is considered acceptable. In some studies, internal consistency values from 0.60 to 0.70 are accepted, which, according to the literature, is "weak".

Also for the validation of the questionnaire, a pretest was applied in order to improve and increase the reliability and validity of the data collection instrument. The pre-test questionnaire was answered by a group of 14 collaborators; it was intended to evaluate the time for its completion, clarity and understanding during the response process.

### 4 ANALYSIS AND DISCUSSION OF RESULTS

This section presents the results of the research. Regarding gender, our respondents are 56,9% male and 43,1% female. In relation to age, the majority of respondents are between 26 and 35 years old, with a total of 76.3% until the age of 45. Another interesting fact is that the participants up to 25 and over 56 represent 10%. As for academic background, it is evident that 71.9% of the respondents have a Specialization, MBA or Master degree. Regarding the length of service, 78.1% of the respondents are up to 9 years old, of which 18.1% have up to 3 years of service. Regarding the Employees who participated in the investigation, it should be noted that 45.6% of the respondents hold a management position or rewarded position. Inquiring respondents about their knowledge of the Shared Services Centre, it was found that 70% of the participants consider it to be the first time they have had contact with it or have only heard about it:

## 4.1 Analysis of the Results of the Favourable Factors

To check the degree of internal consistency the coefficient of consistency "Cronbach's alpha " was applied, which had an internal consistency of 0.927, according to Table 1. According to the literature it is considered "good reliability" or "high reliability".

From a more detailed analysis it can be inferred that, if the indicator "Enables better insertion of outsourcers." were excluded, the value of Cronbach's alpha coefficient would increase from 0.927 to 0.929.

As the 12 indicators refer to favourable factors, the total average of the Concordance Level was

Table 1: Reliability Statistics - Favourable Factors.

<b>Reliability statistics</b>			
Cronbach's Alpha	No. Items		
0,927	12		

calculated, obtaining a value of 3.96; this demonstrates that the respondents have concordance (partial or total) for this group of factors. The Table 2 below represents the favourable factors organized by level of agreement.

Table 2: Favourable Factors in Order of Agreement Level.

<b>Favorable Factors</b>	Level Concord	Result
	ance	
Standardizes services	4,4	high agreement
Opportunities to review how the service is provided	4,2	agreement
It enables the institution to improve the allocation of its resources.	4,1	agreement
Improves control over the services provided.	4,1	agreement
Reduces operating costs	4,1	agreement
Increases the efficiency of management related activities	4,1	agreement
It speeds up decisions and processes	4,0	agreement
Strengthens information technology tools	4,1	agreement
It contributes to the qualification of the servers involved	3,9	agreement
Reduces jobs in long-term asset management.	3,8	agreement
Improves the image in society	3,6	No opinion
Allows better insertion of outsourcers	3,3	No opinion

The correlation between the favourable factors was also calculated, from which some conclusions can be drawn:

- it is verified that the correlations present a degree of significance equal or inferior to 0.01; this indicates that one can be sure of 99% of the results;
- the correlation is positive among the indicators; this indicates that the variation among them is directly proportional.

From the analysis to the data, it can be verified that the questions that obtained the best correlation intensity in the results were:

- the correlation between the indicator " It enables the institution to improve the allocation of its resources " and two indicators " Reduces operating costs" (0.744) and " Increases the efficiency of management related activities " (0.707);
- the correlation between the indicator " It speeds up decisions and processes" and " Increases the efficiency of management related activities " (0.735).

## 4.2 Analysis of the Results of the Unfavourable Factors

To check the degree of internal consistency the coefficient of consistency "Cronbach's alpha" was applied, which had an internal consistency of 0,785, according to Table 3.

Table 3: Reliability Statistics - Unfavourable Factors.

Reliability statistics			
Cronbach's Alpha	No. Items		
0,785	8		

From the data obtained it can be inferred that if the indicator "Incompatibility between the information technology tools used..." were excluded from the analysis, the value of the total Cronbach Alfa would increase from 0.785 to 0.789.

The Unfavourable Factors for the creation of a Shared Services Centre for heritage management were also tested on the basis of eight piecemeal indicators that inquired about the level of agreement or disagreement, with a set of statements relating essentially to management, cultural and human aspects, which involve potential risks that should be managed and minimized.

The correlation between the unfavourable Factors was also calculated. From the results obtained it is possible to draw some conclusions:

- it was found that, for these indicators, the correlations can present i) the degree of significance equal to or less than 0.01, this indicates that one can be sure of 99% of the results; ii) the degree of significance equal to or less than 0.05: this indicates that one can be sure of 95% of the results;
- the correlation is positive between the indicators; this indicates that the variation between them is directly proportional.

Table 4: Unfavourable Factors in Order of Agreement Level.

Unfavourable Factors	Level Concordance	Results
Managers may want to avoid taking the risk of failure	3,4	willingness to agree
Faces resistance from the servers involved	3,4	willingness to agree
Lack of compatibility as to managers' expectations.	3,3	willingness to agree
Lack of institutional support.	3,2	willingness to agree
Problems due to cultural differences	3,1	willingness to disagree
Lack of evidence to justify the cost vs benefit of creating a SSC	3,0	willingness to disagree
Incompatibility between the information technology tools used.	2,9	willingness to disagree
It makes budgetary control difficult	2,3	disagree

From the analysis to the data, it can be verified that the questions that obtained the biggest correlation intensity in the results were:

- the correlation between the indicator
  "Managers may not want to assume the risks of implementation failure" and two indicators
  "Lack of compatibility regarding managers' expectations" (0.689) and "Faces resistance from the servers involved" (0.669);
- the correlation between the indicator "Lack of institutional support" and "Faces resistance from the servers involved" (0.508).

#### 4.3 Analysis of the Results of Intellectual Capital Management

To check the degree of internal consistency the coefficient of consistency "Cronbach's alpha" was applied, which had an internal consistency of 0,806, which is considered "good" or "moderate to high reliability".

Table 5: Reliability Statistics - Intellectual Capital Managements.

Reliability statistics		
Cronbach's Alpha	No. Items	
0,806	9	

From the data analysed, it can be inferred that if the indicators "The institution has specialists to deal with new and more complex problems" and "All problems or challenges are first discussed and shared in the institution, before a solution is proposed and disclosed" were excluded from the analysis, the value of the total Cronbach Alfa would increase from 0.806 to 0.823 and 0.816 respectively.

The Intellectual Capital Management of a Shared Services Center for asset management at the Institute was also tested on the basis of nine piecemeal indicators that inquired about the level of agreement or disagreement, with a set of statements relating essentially to the relative effectiveness and efficiency of these indicators.

From the analysis of the results of the Intellectual Capital Management of a Shared Services Centre presented, some conclusions can be drawn that seem relevant to us:

- there is homogeneity in the responses to the indicators under analysis;
- approximately 60% of the respondents agree (partially or totally) with the indicators under analysis, except for the indicators "All problems or challenges are first discussed and shared within the institution, before a solution is proposed and disclosed", "The institution has specialists to deal with new and more complex problems" and "There has been concern in structuring the knowledge, fostering its sharing by other sectors of the organization";
  - the percentage of disagreement (partial or total) tends towards 10%;
  - The number of respondents who neither agree nor disagree tends to be 25%.

The correlation between the indicators relating to the management of intellectual capital was also calculated. Some conclusions can be drawn from this:

- The correlations were found to be 0.01 or less significant: this indicates that 99% of the results can be guaranteed;
- the correlation is positive among the indicators; this indicates that the variation among them is directly proportional.

From the analysis to the data it is possible to verify that the questions that obtained the best correlation intensity in the results were:

 the correlation between the indicator "Enables the institution to capture and retain the knowledge of its employees" and two indicators "Allows managing a set of skills based on theoretical or academic knowledge" (0.698) and "Manage current problems, following standards to solve them efficiently" (0.672);

Table 6: Intellectual Capital Management in order of agreement level.

Intellectual Capital Managements Cor	Level cordance	Results
Manage current problems by following standards to solve them efficiently.	4,0	agreement
Manage a set of capabilities to be harnessed or disseminated throughout the organization.	4,0	agreement
It allows managing a set of skills based on theoretical or academic knowledge.	3,9	agreement
The production of knowledge is based on the experience of the employees.	3,9	agreement
It allows the institution to capture and retain the knowledge of its employees.	3,9	agreement
In addition to the work routines, my sector has the additional purpose of supporting other departments of the organization in its functional process.	3,9	agreement
There has been concern to structure knowledge, fostering its sharing by other sectors of the organization.	3,4	agreement
The institution has specialists to deal with new problems	3,1	willingness to agree
All problems or challenges are first discussed and shared within the institution, before a solution is proposed and disclosed.	2,8	willingness to agree

 the correlation between the indicator "Allows managing a set of skills based on theoretical or academic knowledge" and "Manage current problems, following standards to solve them efficiently". (0,694).

## 5 CONCLUSION AND FUTURE WORK

The focus of this work was on the key question of investigation:

 Can the implementation of a Shared Services Center collaborate positively, directly or indirectly in Intellectual Capital Management in the context of the Federal Institute?

To answer the research question, a synopsis of the main research evidence was presented.

It was evidenced that there was receptivity of the subject by the servers in general, which was characterized by the total of answers obtained to the questionnaire, 60.8%, being 45.6% of these answers made by the managers of the Institution; what demonstrates the interest of the investigation on the part of these stakeholders.

It is worth mentioning that 70% of the participants considered it to be the first time they had contact with this subject or that they had only heard about it; this lack of knowledge in public service is pointed out, in the literature, by several authors. In a more critical analysis, this may also be due to ignorance of the term SSC.

The sample was characterized in relation to gender, age, literary qualification, position and working time in the company.

Additionally, the first analysis to be performed was related to the quality of the questionnaire analysed by the Cronbach Alfa Coefficient. The investigation revealed that for the Favourable Factors, the internal consistency is 0.927, which is considered of "high reliability"; for the Unfavourable Factors, the internal consistency is 0.785, which is considered of "moderate reliability" and, for the indicators referring to Intellectual Capital Management, the internal consistency is 0.806, which is considered of "moderate to high reliability".

The second analysis was on the level of agreement. For the Favourable Factors, the value obtained was 3.96, showing agreement (total or partial); for the Unfavourable Factors the value obtained was 3.08 and for Intellectual Capital Management 3.65.

This indicates that, in the Institution investigated, there is a higher degree of agreement for the aspects: Favorable Factors for the creation of a CSC and Intellectual Capital Management, while for the Unfavorable Factors, the degree of agreement is lower. Thus, the CSC model, as a strengthening for Intellectual Capital Management, can be adopted for Heritage Management, in the Institute's investigated units.

Among the Favors that stand out the most, where there is the greatest agreement, were: Standardization of services; Opportunity for a review of how the service is provided today; Enables the institution to better target its resources and Improves control over the services provided, which corroborates with the existing literature. And those that stood out the least were: It allows for a better insertion of outsourced personnel and Improves the image of the Institute in society.

Of the Unfavourable Factors that stood out the most, in which there is greater agreement, were: Managers may not want to assume the risks of failure of the implementation; Faces resistance from the servers involved and Lack of compatibility as to the expectations of managers. And the ones that stood out the least were: Difficult budgetary control and Incompatibility between the information technology tools used.

Of the indicators for Intellectual Capital Management that stood out the most, in which there is greater agreement, were: Manage current problems, following rules to solve them efficiently; Manage a set of capabilities to be used or disseminated throughout the organization and Allows managing a set of skills based on theoretical or academic knowledge. And the ones that stood out the least were: All the problems or challenges are first discussed and shared in the institution, before a solution is proposed and disclosed; The institution has specialists to deal with new and more complex problems and There has been concern in structuring the knowledge, encouraging its sharing by other sectors of the organization.

As this investigation is carried out under the prism of the SSC and Intellectual Capital Management, in the sphere of the Institute's Heritage Sector, as a proposal for future work, three aspects can be considered:

- Sectoral: expansion of the research to other sectors of the Institute;
- geographical: expansion of the geographical area of research to other organizations of the Institute.
- institutional: extension of this research to other institutions in the Brazilian federal education network.

### ACKNOWLEDGEMENTS

"This work is financed by portuguese national funds through FCT - Fundação para a Ciência e Tecnologia, under the project UIDB/05422/2020".

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