REVISTA CEFAC
SPEECH, LANGUAGE, HEARING SCIENCES AND EDUCATION JOURNAL
Rev. CEFAC. 2016 Mar-Abr; 18(2):459-468 doi: 10.1590/1982-0216201618218815

Original articles

Development and application of an administrative instrument to guide research on Telehealth in Speech and Language Pathology

Desenvolvimento e aplicação de instrumento administrativo para orientação das pesquisas em Telefonoaudiologia

Paulo Marcos Zanferrari[1]
Camila de Castro Corrêa[2]
Chao Lung Wen[3]
Giédre Berretin-Felix[1]

[1] Departamento de Fonoaudiologia da Faculdade de Odontologia de Bauru, FOB-USP, Bauru, SP, Brasil.
[2] Faculdade de Medicina de Botucatu, FMB-UNESP, Botucatu, SP, Brasil.
[3] Faculdade de Medicina, FM-USP, São Paulo, SP, Brasil.

Conflict of interest: non-existent

ABSTRACT

Purpose: to develop and apply a tool to guide research on Telehealth in Speech and Language Pathology and to identify the strong and weak aspects of these projects.

Methods: a questionnaire addressing administrative, technological, financial and sustainable points was developed. Eleven teachers who had been working on projects on Telehealth in Speech and Language Pathology answered the questionnaire. These data were analyzed using descriptive statistics and the SWOT Matrix was applied, enabling the identification of the strong and weak points, and the Ishikawa Diagram used to identify the effects and causes.

Results: the questionnaires were applied and 32 projects in which the purpose of the project, the quality of the information, the communication channels and the benefits to users were identified as strong points, were analyzed, having as the main causes the use of specific multimedia, continued education, the amount of available information and the commitment of the team. Weak aspects such as the absence of qualified personnel in certain stages of the project, the lack of hardware and software updating, the digital exclusion of users and the obsolescence of the project were seen, the main causes owing to the difficulty in technical support, professionals for marketing and training strategies and the maintenance of the developed projects.

Conclusion: the questionnaire was developed and applied, so as to identify the strong and weak points related to training. Maximizing of the time and updating of digital resources were identified as important inputs to extend the benefits of telehealth projects, towards organizational competitive advantage.

Keywords: Telemedicine; Speech, Language and Hearing Sciences; Planning

RESUMO

Objetivo: desenvolver e aplicar um instrumento para orientação das pesquisas em Telefonoaudiologia e identificar os pontos fortes e fracos destes projetos.

Métodos: foi desenvolvido um questionário, abordando quatro competências distintas: administrativa, tecnológica, financeira e de sustentabilidade. Realizou-se a aplicação com 11 docentes que desenvolviam projetos na área de Telefonoaudiologia. Tais dados foram analisados por meio de estatística descritiva e aplicada a Matriz SWOT, que possibilitou identificar os pontos fortes e fracos, bem como o Diagrama de Ishikawa, para identificar os efeitos e causas.

Resultados: foram aplicados os questionários e analisados 32 projetos em que os pontos fortes foram: a missão do projeto, a qualidade das informações, os canais de comunicação e os benefícios proporcionados aos usuários, tendo como principais causas a utilização de multimeios específicos, a educação continuada, a quantidade de informações disponibilizadas e o comprometimento do capital humano. Quanto aos pontos fracos, constatou-se a ausência de especialização da mão de obra em determinadas etapas do projeto, a falta de atualização de hardware e software, a exclusão digital de usuários e a obsolescência do projeto, sendo as principais causas concentradas na dificuldade de suporte técnico, profissionais para divulgação e treinamento, estratégias de marketing e a manutenção dos projetos desenvolvidos.

Conclusão: foi desenvolvido e aplicado o questionário, sendo identificados os pontos fortes e pontos fracos, estando associados a especialização do capital humano. A maximização do tempo e a atualização dos recursos digitais foram identificados como insumos importantes para ampliar os benefícios dos projetos de Telessaúde, rumo à vantagem competitiva organizacional.

Descritores: Telemedicina; Fonoaudiologia; Planejamento

Received on: November 10, 2015
Accepted on: January 17, 2016

Mailing address:
Giédre Berretin-Felix
Al. Octávio Pinheiro Brisola, 9-75
Bauru - SP - Brasil
CEP: 17012-901
E-mail: gfelix@usp.br

INTRODUCTION

Instruments available in the area of Business Administration are used to analyze if products or services are keeping their functionality within what was planned during their design and the chances of being adopted by consumers in the current market [1].

Thus, SWOT analysis [2], an instrument which assesses the status of the organization and its products in relation to the market, aiming at eradicating the constant failures of corporate planning, was created. The analysis consists of four distinct variables, i.e., the strengths, weaknesses, opportunities and threats [2].

The SWOT analysis is not a privilege of the Business Administration area, though, for it is also present in other segments where objective and reliable interpretation of a particular institution and its operational mode is needed. For instance, the analysis of palliative care in Latin America, helping to identify common aspects among countries and key elements in their development [3].

Another important instrument in this context is the Ishikawa diagram which serves to identify the potential causes for the recurrence of a defect or failure in the product or services, as well as a critical analysis of the operational process which is being developed [4]. Its importance extends to the analyses of medical cases to improve the clinical reasoning skills and enhance the knowledge of medical students and physicians being trained, thus, facilitating the teaching-learning process [5]. Aided by these instruments, the strategic planning of an organization will be founded on solid bases and visible to everyone involved [1].

To ensure the effectiveness of the application of such instruments, it is necessary to maintain an adequate communication, so that such analyses achieve their goals[6].

Communication can be established by diverse means, including digital information, which when added to health, gives rise to tele-health, tele-education and tele-care [7]. These resources should be considered from educational models, using technological instruments, combined with the goal of enhancing patient care [8,9], owing to their proven efficacy [10].

A wider nomenclature, tele-health involves the exchange of health information among distant sites, encompassing activities that go beyond patient care, the concern with health promotion, patients and professionals education, disease prevention, epidemiological surveillance, health service management and environmental protection, among others [11].

Different strategies have been used by telemedicine, allowing the training of health professionals in medicine, dentistry, nursing, speech therapy, physical therapy, mental health and social care, the most known areas. The interface among specialties, provides customization with productive and economic characteristics.

In terms of telehealth in the area of Speech Therapy and Audiology, a prevalence of publications in the area of Audiology, with greater focus on assessment or intervention, has been observed, and the number of papers on this subject has risen, mainly in the last five years [12]. Correlating telehealth in speech and language pathology and audiology, inserted into the contemporary marketing and compared to the condition of product or service, it can be made available to users, provided that studies examining its quality and facilitating the sustainability of such actions with optimization strategies for its operation, be carried out [13].

Thus, this study aimed at developing and implementing a instrument to guide research in telehealth in speech and language pathology and audiology, and identify the strengths and weaknesses of these projects.

METHODS

Ethical aspects

The study was approved by the Ethics Committee on Human Research of the Bauru Dentistry School, University of São Paulo, under process No. 133/2011. All participants were informed about the procedures involved in the research, by reading and signing the Informed Consent.

Sample

Eleven professors working on telehealth research along with the Speech Therapy Department of the above mentioned educational institution participated in this study.

Procedures

The works produced by the professors, related to the research line defined in this study, were identified and cataloged by the Curriculum Lattes analysis, as well as the access to Scielo, PubMed, Dedalus and Bireme databases.

A questionnaire was developed and applied (Figure 1), so as to identify, based on four pillars of great importance within an operating process, the strengths and weaknesses of the projects, through the SWOT analysis and the Ishikawa Diagram.

Professor:					Date:
I – Indicators of the Administrative Competence					
a) Current condition of the project					
Name of the Project		In progress		Accomplished	
		Within time limit	Out of time	Within time limit	Out of time
b) The accomplished project meets the objectives proposed in the telehealth area with a performance					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
c) The level of use of the Project by the target public can be considered:					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
d)The divulging degree of the Project can be considered:					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
e) The communication multimedia used for the development of the project can be considered					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
f) The accessibility of the target public to the material developed can be rated as					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
g) The amount of information offered by the project to the target audience was					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
h)Taking the benefits of the project into account, it can be stated that the result was					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
II – Indicators of Technological Competence					
a) The level of technology used in the development of the project can be considered					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
b) The ease of the user in operating the content of the project can be assessed as					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very Bad (1)
c) The level of project content updating can be considered					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very Bad (1)
d) The technological potential of the project in hardware can be considered:					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very Bad (1)
e) The technological potential of the project in software can be considered:					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very Bad (1)
III - Indicators of Financial Competence					
a) Did the project receive financial resources for its development and execution?					
Name of the Project		Yes		No	
In case the answer is negative, justify the reason (s)					
b) The time for the financial resource to be released for the development of the project can be regarded as					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
c)The financial incentive the Project was given to be performed can be considered					
Name of the Project	Very low (5)	Low (4)	Mean (3)	High (2)	Very high (1)

d)The legal procedures for the financial resources to be approved, for the Project to be developed, can be considered					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very Bad (1)
e)The cost-benefit relation of the project can be considered					
Name of the Project	Very low (5)	Low (4)	Mean (3)	High (2)	Very high (1)
IV - Indicators of Sustainability Competence					
a) The sustainability of the project, in relation to technological and digital changes, can be considered					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
b) The adaptation of the Project, in relation to future digital changes, can be considered					
Name of the Project	Excellent (5)	Good (4)	Reasonable (3)	Bad (2)	Very bad (1)
c) The project´s sofware obsolescence, over time, can be considered					
Name of the Project	Very low (5)	Low (4)	Mean (3)	High (2)	Very high (1)
d) The project´s hardware obsolescence, over time, can be considered					
Name of the Project	Very low (5)	low (4)	Mean (3)	High (2)	Very high (1)
e)The ideal number of professionals involved, for the Project to keep on going, can be considered					
Name of the Project	Very low (5)	Low (4)	Mean (3)	High (2)	Very high (1)
Comments					

Figure 1. Survey questionnaire of project productivity in telehealth in speech and language pathology and audiology

This questionnaire consisted of 23 questions, divided into four distinct areas: administrative, technical, financial and sustainability. The scoring criteria of the questionnaire used were: excellent / very low - 5; good / low - 4; reasonable / mean - 3; bad / high - 2; bad / very high - 1; yes - 2; no - 1. Thus, the questionnaire allowed the decreasing classification of the main points highlighted by the professors interviewed, viewing, hence, the positive and negative aspects, converting into percentage and identifying the factors of higher and lower impact, in relation to the projects (SWOT analysis).

Following the collection of these data, the possible causes of the performance achieved by the competences identified as strengths and weaknesses, were calculated.

After identifying the positive and negative effects of the research object, the Ishikawa diagrams were drawn up, aiming at discovering the causes which triggered the strengths and weaknesses of each project. Such a diagram allowed analyzing, individually, the strengths and weaknesses found, by allocating each one of them at the ends of the diagram spine, and from this moment on, the relevant causes which contributed to the performance of the work in telehealth (Figure 2), were assigned to each positive or negative factor of the project.

Data analysis

The data were tabulated in a spreadsheet in Excel, interpreted by the use of quantitative descriptive analysis, using descriptive measures (minimum, maximum values, median and percentage), shown in Table, graphs and figures.

RESULTS

The survey with the professors was conducted, resulting in a total of 48 projects, of which 32 were completed on time, while the remaining is under development, within the planned timelines. For the purpose of this research, completed projects that add up to thirty-two were considered and analyzed, allowing a more cohesive and accurate visibility, regarding the objectives of the study (Table 1).

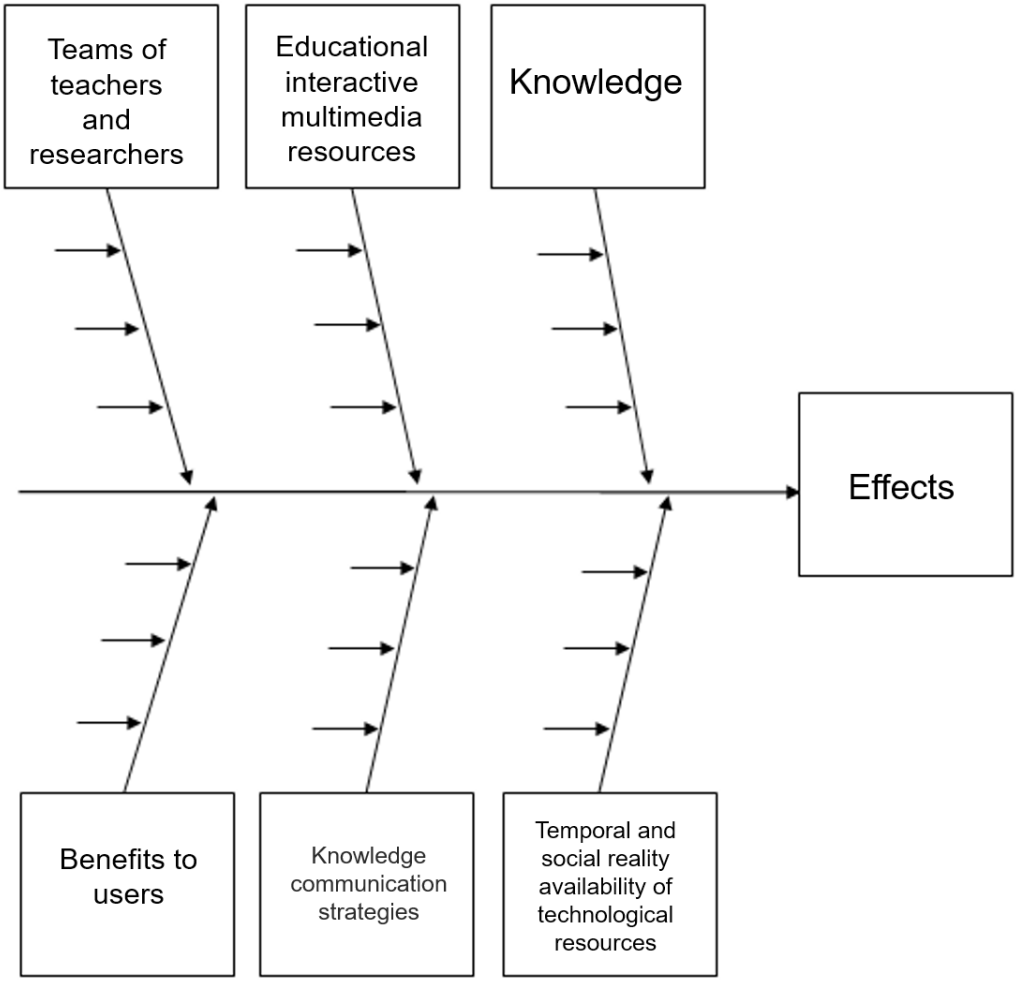

Figure 2. Adaptation of the Ishikawa Diagram applied to the academic scenario of this research

Tabela 1. Apresentação do número de projetos desenvolvidos (concluídos e em andamento) por cada docente do Departamento de Fonoaudiologia da Faculdade de Odontologia de Bauru, na área de Telessaúde

Professor	Nº of projects underway	Nº of projects completed	Total of projects
1	1	11	12
2	4	2	6
3	3	5	8
4	2	2	2
5	0	2	2
6	0	2	2
7	1	2	3
8	3	1	4
9	2	3	5
10	0	1	1
11	0	3	3
Total	16	32	48

From the interpretation of the data achieved through the questionnaires directed to the professors in charge of projects, followed by the interpretation of the scores for each specified competence, it was found that the administrative competence showed a greater usefulness and assertiveness degree, as compared to the other pillars analyzed, with a maximum score of 1.034 points (87.33%).

The questions inserted in this variable showed that the projects have a high degree of administrative managing, seeking the goals set when elaborating the guidelines that guided the research. On the other hand, sustainability was the competence that showed the lowest degree of productivity, with 250 points (65.10%). The remaining competences showed the following results: technological competence with 470 points (86.39%) and financial competence with 242 points (84.00%), as shown in Figure 3.

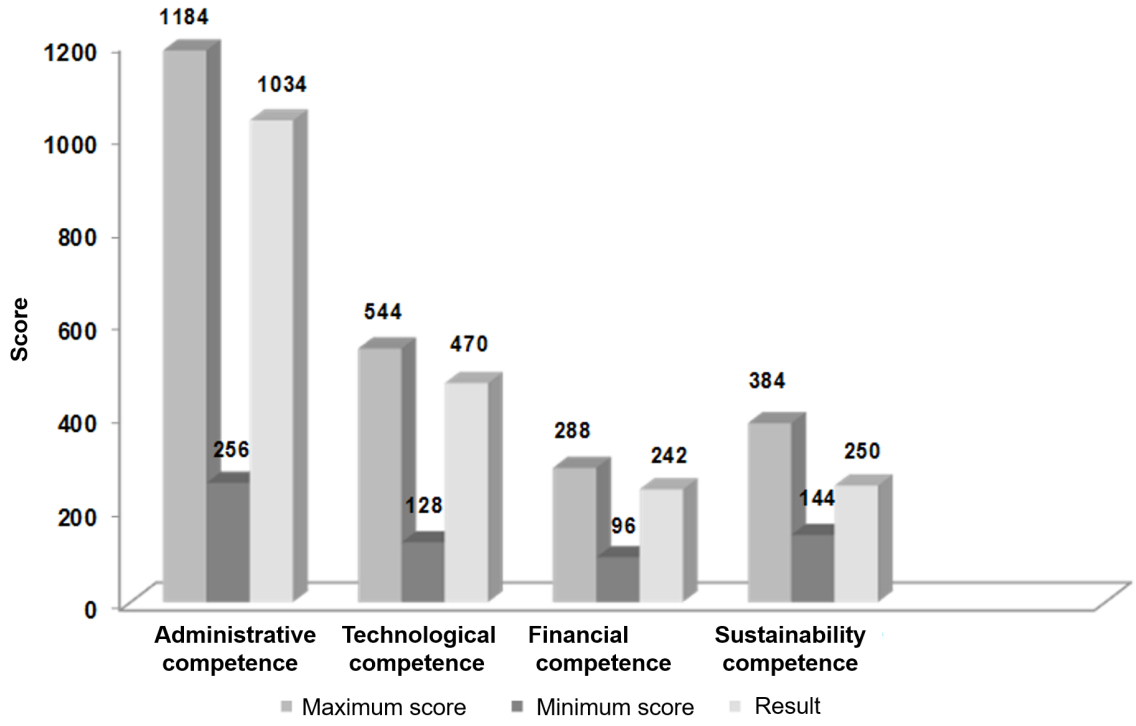

Figure 3. Minimum and maximum score achieved in the competences considered in assessing productivity

This graph was built, taking into account the maximum and minimum limits corresponding to the sum of the scores related to the different issues assigned to each of the competences analyzed, by comparing them with the results.

The application of SWOT analysis allowed visualizing the factors which contributed, positively and negatively, to the performance of the projects, from the planning to moment of making them available to users, as shown in Figure 4.

The strengths were found in the administrative competence, obtained from the analysis of the results of the productivity questionnaires responded by the professors. After surveying and identifying the area that positively contributed to the project, the priority was to find the main causes which led to the results highlighted in Figure 5, according to the Ishikawa diagram model.

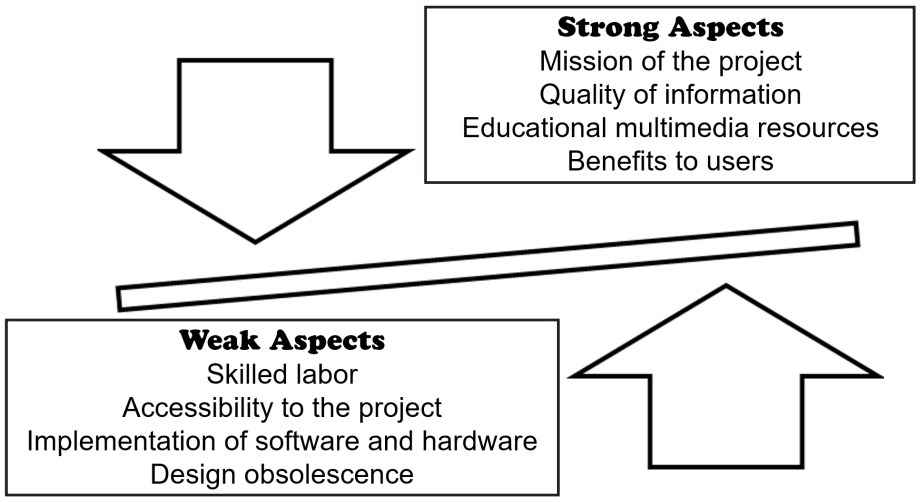

Figure 4. Summary of the results obtained from the application of SWOT analysis

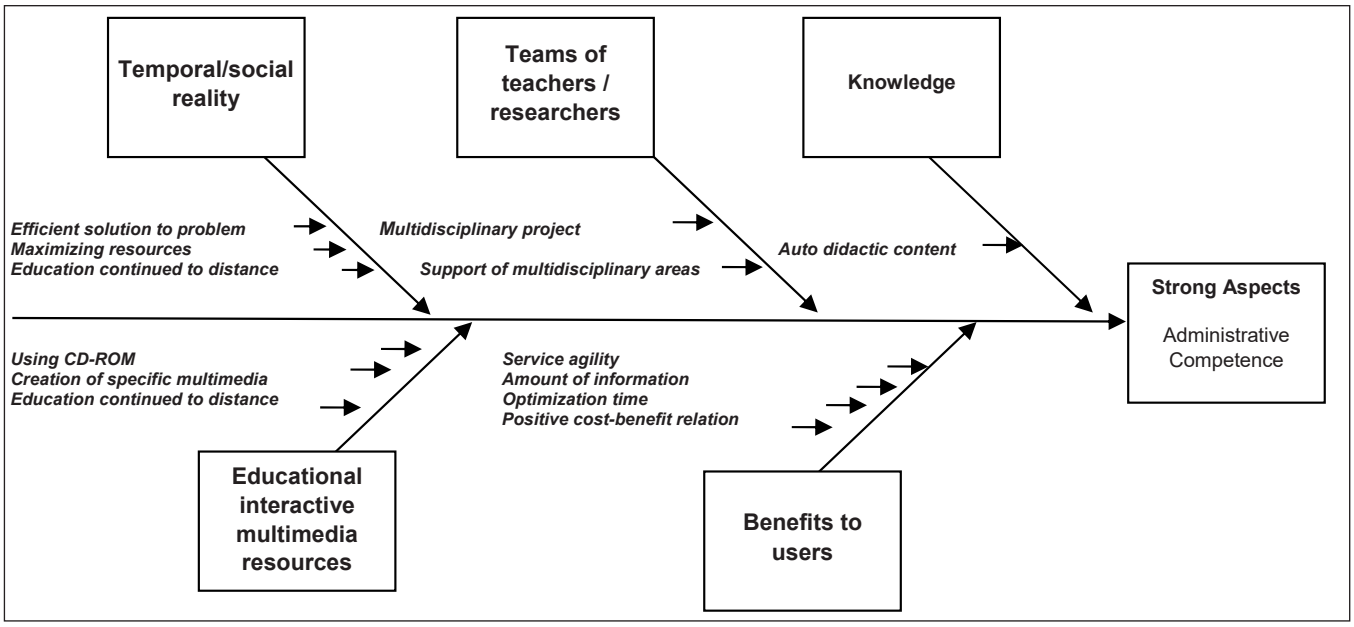

Figure 5. Strengths in relation to administrative competence, through the Ishikawa Diagram

The information obtained through the questionnaire showed that the structural efficiency is concentrated in the categories: temporal and social reality, teams of teachers and researchers, knowledge, educational interactive multimedia resources and benefits to users. These aspects allowed reaching a positive result in relation to this variable. It should be emphasized that the constant specialization of human capital, the availability of technological resources, supported by dynamic and flexible strategies, contribute for results of this nature to be repeated.

The weaknesses pointed out in the research are directed to the competence of sustainability, using the same devices that were applied on the strengths, seen before. After surveying and identifying the area which negatively contributes to the project, it is time to seek the root causes that led to this result (Figure 6).

The survey showed a structural deficiency in relation to the technical staff, availability of technology and accessibility, technology availability in software and hardware and knowledge communication strategies. The delay in approving such resources, as well as the choice of partners for process development, hinders the productivity of this variable.

The same unsatisfactory impact is seen with the downgrade of software and hardware. Obsolescence is

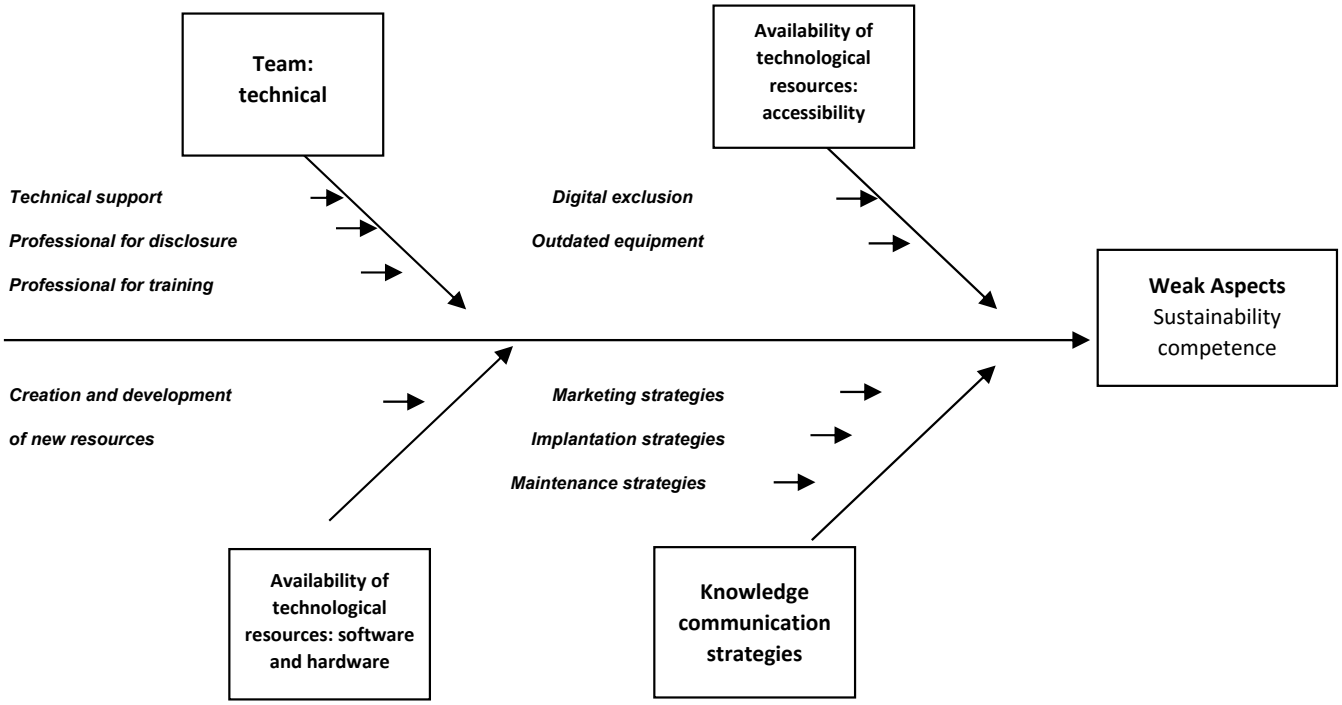

Figure 6. Weaknesses in relation to administrative competence, through the Ishikawa Diagram

implicit from the moment new technologies are implemented and the instrument does not have access to them. Another factor worth mentioning is the obsolescence of hardware equipment located in the areas of community outreach, hindering the implementation of the projects.

DISCUSSION

The application of Business Administration Area instruments together with telehealth in speech and language pathology and audiology had as the main challenge the interaction and synergy between these areas, apparently distinct regarding definition and implementation, but similar when it comes to their goals. This concept becomes more evident when general aspects are compared between these areas, such as the management of the administration, financial management, technology and sustainability. It represents the alignment and development of the team's ability to create the results its members truly desire[14].

Through this survey, it was possible to identify the projects developed by each professor, in the field of telehealth, with more than a third of professors linked to the aforementioned Department, showing that productivity in the development of this type of project has increasingly grown. Among the professors surveyed, one has developed twelve projects in telehealth in speech and language pathology and audiology, so far, and the others have coordinated the execution of one or more projects in this segment, corroborating literature findings [12].

The creation of the questionnaire and the application of the so-called SWOT matrix instrument allowed the identification of the strengths and weaknesses of the projects studied. It should be noted that these methods provide within the corporate setting, the analysis of practicality, as well as propitiate visibility of the external and internal environment of the company, the research of opportunities and threats, the planning of new scenarios, through the analysis of strengths and weaknesses [15].

In this sense, the administrative competence showed a higher degree of productivity in relation to the others, demonstrating that the projects have a high degree of productivity in terms of administrative management, achieving the proposed objectives from its elaboration to its conclusion.

Technological and financial competences demonstrated performances similar to that of the administrative competence. Conversely, the competence sustainability corresponded to weakness, demonstrating the need to develop specific strategies to enhance the productivity and efficiency of projects during their use.

No research was found in this area, however, it should be emphasized that the sustainability

competence analysis can be operated by institutions which have interdisciplinary areas, focusing on the basic principles of sustainability: social, economic and environmental ones [13]. The analysis of administrative competence through the SWOT matrix, allowed identifying, in the telehealth projects, that the strengths are comprised by the mission of the project, the quality of information, ease of access to information and the benefits they provide to their users. Regarding the sustainability competence, the SWOT analysis helped to confirm that the weaknesses are expressed by the difficulty of skilled labor, accessibility to the project, implementation of software and hardware and design obsolescence.

The analysis of strengths and weaknesses is paramount in all areas, as in the analysis of the health systems of different countries, showing integration and increase in the number of professionals trained in palliative care, but also noting the lack of programs on palliative care and limited connection between politicians and health professionals [3]. The application of the Ishikawa diagram in telehealth projects allowed assessing the main causes that contributed for the administrative competence to be regarded as strength and the sustainability one, as weakness.

Accordingly, the Ishikawa diagram was used to help memory and recovery of important cases from the medical literature in a university, resulting in more efficient studies to improve clinical reasoning skills, thus, expanding professional knowledge [5].

Thus, it was verified that the project's strengths had as main causes the use of specific multimedia, continuing education, the amount of information provided and the commitment of human capital. The weaknesses are pointed out, as well, and the main causes were centered in the difficulties of technical support, professionals for divulging and training, digital exclusion, lack of marketing strategies and the difficulty to maintain the projects studied. Regarding the weaknesses, specifically, the need to define and validate a stable model in telehealth with organizational change, providing care in the implementation and assessment of such projects[16], is noted.

The development and application of the questionnaire follow a strategic line for the standardization of a procedure aimed at guiding telehealth in speech and language pathology and audiology projects, enhancing the quality of responses and interpreting them in a rational and contextualized way, from the view of business administration, with positive results in an organization. Thus, the importance of evaluating projects inserted into a Department of Research Institutions, as well as their assessment by the subjects directly involved in the initiative, is emphasized [17-20].

The constant analysis of the strengths and weaknesses of projects in telehealth, provide perfect functioning and the required quality at the time of making them available to users. Non-observance of this strategy can cause the project to have a life cycle shorter than the one expected, making it obsolete. Thus, given the technological and market developments, institutions are required to keep a positioning and differentiation strategy, so as to ensure their success through the management of the volume of investment in new technologies, specialization of human capital, innovation and renewal in each stage of the project.

The assessment of telehealth use is still observed in a non-systematic way, without the establishment of standard questionnaires, in other researches [17,19,21].

Finally, the limitations of the study, which considered just one center of research on telehealth in speech and language pathology and audiology in its sample, should be taken into account, as well as the need to validate the proposal developed in the current research, allowing the analysis of productivity, by accurately determining the strengths and weaknesses of each project, in the field of telehealth.

CONCLUSION

This research resulted in the development of an administrative instrument to guide research on telehealth in speech and language pathology and audiology, allowing identifying the strengths concentrated in the administrative competence and the weaknesses in the sustainability competence.

REFERENCES

1. Martins PG, Laugeni FP. Administração da produção. 2. ed. São Paulo: Saraiva, 2005.
2. Tarapanoff, K. Inteligência organizacional e competitiva. Brasília: UnB, 2001.
3. Pastrana T, Centeno C, De Lima L. Palliative care in latin america from the professional perspective: a SWOT analysis. J Palliat Med. 2015;18(5):429-37.
4. Davis MM, Aquilano NJ, Chase R. Fundamentos da administração da produção. 3. ed. Porto Alegre: Bookman Editora, 2001.

5. Wong KC. Using an Ishikawa diagram as a tool to assist memory and retrieval of relevant medical cases from the medical literature. J Med Case Rep. 2011;29(5):120.
6. Griffin RW, Moorhead G. Fundamentos do comportamento organizacional. Tradução Fernando Moreira Leal e André Siqueira Ferreira. São Paulo: Ática, 2006.
7. Silva AS, Rizzante FA, Picolini MM, Campos KD, Corrêa CC, Franco EC et al. Bauru School of Dentistry Tele-Health League: an educational strategy applied to research, teaching and extension among applications in tele-health. J Appl Oral Sci. 2011;19(6):599-603.
8. Bastos BG, Ferrari, DV. Internet and education for the patient. Arq Int Otorrinolaringol. 2011;15(4):515-22.
9. Ferrari DV. Therapeutic patient education via tele-audiology brazilian experiences. The hearting review. 2012;19(11):40-3.
10. Haney ML, Silvestri S, Van Dillen C, Ralls G, Cohen E, Papa L. A comparison of tele-education versus conventional lectures in wound care knowledge and skill acquisition.J Telemed Telecare. 2012;18(2):79-81.
11. Costa CA, Petrucio WS, Rodrigues PMA, Lages RO, Wen CL. Effectiveness of practices for Web Conferencing Teleducation to combat dengue in the State of Amazonas, Brazil. J health inform. 2014;6(1):15-8.
12. Regina Molini-Avejonas D, Rondon-Melo S, de La Higuera Amato CA, Samelli AG. A systematic review of the use of telehealth in speech, language and hearing sciences. J Telemed Telecare. 2015;21(7):367-76.
13. Gudim RS. Gestão dos fatores determinantes para sustentabilidade de centros de Telemedicina [tese]. São Paulo (SP): Faculdade de Medicina. Universidade de São Paulo; 2009.
14. Senge PM. A quinta disciplina: arte, teoria e prática da organização de aprendizagem. São Paulo: Best Seller, 1990.
15. Brasil - Tribunal de Contas da União. Análise SWOT e Diagrama de Verificação de Risco aplicados em Auditoria. Tribunal de Contas da União. Brasília: TCU, Secretaria de Fiscalização e Avaliação de Programas de Governo (Seprog), 2010.
16. Zannad F, Maugendre P, Audry A, Avril C, Blaise L, Blin O et al. Telemedicine: what framework, what levels of proof, implementation rules. Therapie. 2014;69(4):339-54.
17. Conceição HV, Barreira-Nielsen C. Health hearing training: assessment tool in the Brazilian National Telemedicine Program. Rev CEFAC. 2014;16(5):1426-33.
18. Blasca WQ, Correa CC, Picolini MM, Campos K, Silva ASC, Berretin-Felix G et al. Una estrategia de teleducación sobre la salud auditivay vocal en Brasil. Rev Logop Foniatr Audiol. 2015;35(1):2-7.
19. Corrêa CC, Freire T, Zabeu JS, Martins A, Ferreira R, Francisconi PAS et al. Teleducation about Cleft Lip and Palate: an interdisciplinary approach in the promotion of health. Int Arch Otorhinolaryngol. 2015;19(2):106-11.
20. Maximino LP, Picolini-Pereira MM, Carvalho JLB. Telegenetics: application of a tele-education program in genetic syndromes for Brazilian students. J Appl Oral Sci. 2014;22(6):477-83.
21. Penna GC, Mendes HG, Dias MAS, Melo MCB, Santos AF, Resende MC et al. Evaluation of the use of videoconferencing for distance training of doctors in the family health teams within the national telehealth project. Rev Med Minas Gerais. 2015;25(1):108-14.