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NUVEM DE PALAVRAS COMO FERRAMENTA DE ANÁLISE DE CONTEÚDO: UMA APLICAÇÃO AOS DESAFIOS DO ENSINO NO MESTRADO PROFISSIONAL

WORD CLOUD AS A TOOL FOR CONTENT ANALYSIS: AN APPLICATION TO THE CHALLENGES OF THE PROFESSIONAL MASTER'S DEGREE COURSES

NUBE DE PALABRAS COMO HERRAMIENTA DE ANÁLISIS DE CONTENIDO: UNA APLICACIÓN A LOS DESAFÍOS EN LA ENSEÑANZA DEL MÁSTER PROFESIONAL

Rosana Brandão Vilela¹

Adenize Ribeiro¹

Nildo Alves Batista²

¹ Universidade Federal de Alagoas, Alagoas, Brasil

² Universidade Federal de São Paulo, São Paulo, Brasil

Rosana Brandão Vilela - zanavilela@gmail.com | Adenize Ribeiro - adenizeribeiro@gmail.com | Nildo Alves Batista - nabatrasta@gmail.com



Corresponding Author

Rosana Brandão Vilela

Universidade Federal de Alagoas

Av. Lourival Melo Mota, S/N

Tabuleiro do Martins

Maceió - AL

CEP 57072-900 - Brasil

zanavilela@gmail.com

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RESUMO

Introdução: Este artigo descreve o uso da técnica Nuvem de Palavras na análise de dados qualitativos, sendo utilizada para identificação de desafios aos mestrados profissionais em ensino na saúde (MPES).

Objetivo: Identificar os desafios dos mestrados profissionais através da utilização da técnica da Nuvem de Palavras.

Métodos: Utilizou-se o *software aplicativo Wordle* para a construção de Nuvens de Palavras. A técnica serviu como ferramenta de apoio ao processamento de dados na pesquisa qualitativa, realizada em 2016. A produção das informações foi realizada por meio de questionário, no qual foi aplicado um roteiro semiestruturado a docentes e discentes de treze programas do país.

Resultados: As seis categorias resultantes da análise e interpretação de Nuvens de Palavras, sobre fatores facilitadores e dificultadores, indicaram a presença de desafios institucionais e outros inerentes ao programa.

Conclusões: Constatou-se que é essencial compreender a essência dos mestrados profissionais e dar suporte ao desenvolvimento desses programas na área do ensino na saúde. E que, o uso da técnica de Nuvem de Palavras, junto ao olhar atento dos pesquisadores, permite a análise dos dados com segurança.

Palavras-chaves: nuvem de palavras; mestrado profissional; ensino na saúde; pesquisa qualitativa; análise de conteúdo

ABSTRACT

Introduction: This article describes the use of the word cloud technique in qualitative data analysis, being used to identify challenges to professional master's degree courses in health education (PMHE).

Objective: Identify the challenges of two trained professionals through the use of the technique of Nuvem de Palavras.

Methods: The software *Wordle* was used for the construction of word clouds. The technique served as a tool to support data processing in qualitative research conducted in 2016. The information was collected through a questionnaire in which a semi-structured script was applied to teachers and students in thirteen programs in Brazil.

Results: The six categories resulting from the analysis and interpretation of word clouds in facilitating and hindering factors indicated the presence of institutional and other challenges inherent in the program.

Conclusion: It was found that it is essential to understand the essence of professional master's programs and to support the development of these programs in the area of health education. And that, the use of the word cloud, together with the watchful eye of the researchers, allows the data to be analysed with assurance.

Keywords: word clouds; professional master's degree; health education; qualitative research; content analysis

RESUMEN

Introducción: En este artículo se describe el uso de la técnica nube de palabras en el análisis de datos cualitativos, siendo utilizada para identificar desafíos a los másters profesionales en enseñanza en salud.

Objetivo: Identificar los desafíos de los dos profesionales de la profesión atraídos por la utilización de la técnica de Nuvem de Palavras.

Métodos: Se utilizó el *software* aplicación *Wordle* para la construcción de nubes de palabras. La técnica sirvió como herramienta de apoyo al procesamiento de datos en la investigación cualitativa, realizada en 2016. La recolección de las informaciones fue realizada por medio de un cuestionario, en el cual se aplicó un itinerario semiestruturado a docentes y discentes de trece programas del Brasil.

Resultados Las seis categorías resultantes del análisis y interpretación de nubes de palabras, sobre factores facilitadores y dificultadores, indicaron la presencia de desafíos institucionales y otros inherentes al programa.

Conclusiones: Se constató que es esencial comprender la esencia de los másters profesionales y dar soporte al desarrollo de estos programas en el área de la enseñanza en la salud. Y que, el uso de la técnica de nube de palabras, junto a la mirada atenta de los investigadores, permite el análisis de los datos con seguridad.

Palabras Clave: nube de palabras; maestría profesional; enseñanza en la salud; investigación cualitativa; análisis de contenido

INTRODUCTION

Qualitative research in health has been affirmed in recent decades and, in the area of teaching or health education, its dissemination has been broadened (Araújo 2011). This increased focus can be understood by the dynamics of the approach,

where researchers seek to understand the perspective of participants, interpreted by the researcher's experiences (Creswell, 2010).

The researchers' possibilities and the consequent increase in research production are allied to technological advancement. Regarding computerization in qualitative research, Bardin (2011) points out that the effective aid of this resource occurs in the treatment of the text, in analysis operations such as categorization and statistics on the results obtained. However, even with the use of a technological resource, the researcher needs to be aware of the process.

The word cloud is a widely available data processing tool but still little used. One such free software application – Wordle – was written as a personal project by Jonathan Feinberg in 2005. It incorporates code (with permission) developed by the author for IBM Research (Feinberg, 2014).

Wordle is available on the web and is defined as “a toy for generating word clouds in a two-dimensional graphical arrangement” (Feinberg, 2014). Word clouds are therefore graphic-visual representations that show how frequent words occur in a text. The more the word is used, the more striking its representation is in the graph. Words appear in various-sized fonts and in different colours, indicating what is most and least relevant in context. The program runs on the user's computer and the use of the generated images is free.

The word cloud can have many uses, from highlighting the most searched terms on electronic sites (Lunardi, Castro and Monat, 2008), to serving as a tool for teaching and learning (Ramsden & Bate, 2008). In Brazil, it is possible to find some studies that use and indicate this tool to analyse qualitative data in health (Kami et al, 2016; Souza et al, 2018) and health education (Carvalho Júnior et al., 2012; Cruz et al., 2019).

Given the studies mentioned above, which referenced the Wordle application with possibilities for data analysis in qualitative research, we opted to use word clouds to process data on factors that could negatively or positively influence the development of a professional graduate program.

This type of training – Professional Master's (PM) – is characterized by a living network, composed of actors and institutions fully committed to the experience derived from the world of work. Therefore, it has practices as a scenario for reflection to construct new knowledge – since its purpose is to equate and propose interventions for a problem that emerged from this practice – seeking to improve the working and living conditions of productive organizations in this context, in this case, health education to strengthen the Universal Health System (UHS).

Considering that the PM is an experience of innovation and reinvention in which students come to illuminate their practices with theories, the proponent institutions of this teaching practice learn a great deal, having practitioners as their students (Moura Castro, 2005). Therefore, the education of students enrolled in this type of education should be guided by the adoption of methodologies that privilege the development of competences, since one of the characteristics of the professional of the new millennium is to know how to mobilize and combine suitably a set of resources. to manage a complex situation (Boterf, 2003).

Given the challenge of understanding and describing the use of this tool in research and the need to deepen studies on assessing programs, the aim of this article is to reveal the potential of the word cloud technique to construct analyses on the challenges of professional masters in health education (PMHE), starting with the factors that facilitate and hinder this mentioned by both teachers and students of the programs.

1. METHODS

This study is derived from a broader survey completed in 2016, whose aim was to guide the existing PMHEs in Brazil seeking subsidies to improve the programs. This dissertational research, with a quantitative and qualitative approach, used content analysis in the thematic modality associated with the word cloud technique to process qualitative data. The results of the information submitted for thematic analysis had been previously published (Vilela & Batista, 2016).

The data presented here refer to a descriptive and analytical qualitative study, using the word cloud technique, as a support tool in processing information on the challenges faced by professional master's programs in health education within the national territory. A more summarized version of these results were published (Vilela, Ribeiro and Batista, 2018), in the minutes of the 7th Ibero-American Congress on Qualitative Research (CIAIQ2018).

The formation of word clouds was used here as a complementary technique to thematic analysis. The cloud emerged from lexical analysis; Lexicon is understood as the set of words that make up a given text. From this angle, the construction technique of these clouds consisted of using different font sizes and fonts according to the frequency of word occurrences in the analysed text analysed (Rivadeneira et al., 2007).

This piece is a study that took as its scenario thirteen professional master's programs in health education (PMHE) from different regions of Brazil. The sample was represented by two groups of subjects in order to investigate the challenges. The first was formed by 50 PMHE teachers and the second by 152 PMHE students.

The information used in this article was produced through a semi-structured questionnaire, applied online to the teachers and students of PMHE with questions about the factors inherent to the course that would be generating positive impacts, or causing

limits to its development. Thus, each question characterized a text, and all these texts constituted the corpus of analysis of this research, representing the voice of the teachers and the students, separately.

The research corpus at the genesis of this article was composed of 202 texts (50 teachers and 152 students), a significant number to organize and transcribe, for the purpose of analysis. With this corpus, editing the entire archive was considered essential to standardize acronyms and variations in singular and plural that represented the same meaning, correct typos, and spelling errors.

McNaught and Lam (2010) recommend the online application Wordle for word cloud building in qualitative research. Thus, we used this application, available at www.wordle.net, with the common terms of the Portuguese language removed as a setting for cloud production. This enables a “clean representation,” highlighting only those classes of words that carry the relevant sense and meanings, i.e., those of greater importance within a text. We also selected - *colour*> *custom palette*; *font*> *expressway free*; *word layout* – *layout*> *horizontal*; *layout*> *rounder edges*. Finally, there was the setting for maximum number of words per cloud to concentrate only on the most important words. The cloud was configured to have a maximum of fifty words: *layout*> *maximum words*. After transcribing and readjusting the text for each question to the set parameters, the clouds were generated by copying and pasting from the text in the appropriate window on the Wordle website.

In the last stage of the content analysis method, that is, the analysis phase itself, cloud observation was associated with reflection and intuition to establish relationships with reality and to deepen the connections of ideas that teachers and students of PMHE externalize in speech.

This research was supported by the UNIFESP Research Ethics Committee – Brazil Platform [Comitê de Ética em Pesquisa da UNIFESP – Plataforma Brasil] and approved by Decision 428.955. All participants signed the Informed Consent Form (ICF).

2. RESULTS

To address the challenges of the programs, the study was based on two guiding nuclei based on participants’ responses to the potentiating factors and the constraining or hindering factors in undergoing PMHEs.

2.1. Guiding Core: Potentiating Factors

The word clouds that demonstrate the construction of empirical categories referring to the data obtained through the statements about the facilitating factors for the implementation and development of PMHEs are presented below. They are: Structure of PMHEs committed to UHS (the practice) and Poor visibility of the Final Product as a Facilitator.

The category Structure of

PMHE **committed to UHS** (the practice) was conceived from the teachers’ and students’ word clouds (Figure 1 and Figure 2, respectively).



Source: the authors

Figure 1 – Word cloud expressing facilitating factors to the development of the PMHE among the teachers

Figure 1 shows that the words to which the teachers attributed greater prominence to as p elements refer to: multi-professional student body and inserted in practice, multi-professional and committed faculty. The enabling factors can also be seen: UHS, here as a scenario of practice and point of articulation between academia and the world of work; the interdisciplinary character of the course enabling the integration of knowledge; the curricular structure of the course committed to real practice.

The student body’s word cloud regarding PMHE potentiating (Figure 2) is similar to Figure 1. In the words of the students, it is worth highlighting the compatibility of the course with work, as a facilitating aspect of this process, reinforcing the commitment to the professional who is in practice. Maintaining the commitment of PMHE to UHS was perceived as a challenge to the programs.

3.1.3 - Resistance to the student profile

The challenge of the program is to guarantee the quality of education and to complete it on time without full dedication, because, unlike what happens in academic post-graduate programs, students need to maintain their professional activities while performing their training. These findings constitute important challenges for the curriculum and student orientation and coincide with studying reports by the PMHE coordinators (Vilela and Batista, 2016).

There is also a strong appeal for students of the professional program to have characteristics similar to those required by the academic masters in the word clouds of teachers and students. More than a decade ago, Fischer (2005) stressed how much this type of behaviour makes it difficult to see the program as a vocational training strategy with its own nature and structure.

To assume the provocative model of the PM with innovative possibilities in its curricular arrangements, not dissociated from the UHS project and compatible with the student profile of this modality, is certainly the possibility of the remodelling of thinking and doing the Brazilian post-graduate degree.

3.1.4 - Fragility in the articulation between academia and the world of work

The difficulty of the master's degree of getting time off from work on program days points to the need for greater articulation between the PMHE with the world of work, the UHS. This fragility compromises the participation of students in the PMHE by not providing support, such as reduction in the workload or a financial incentive (Quelhas and França, 2005).

3.2- Institutional challenges

3.2.1 – Lack of a support program for PMs

It was possible to see from the clouds (the teachers' and students') the relevance of funding, either for research support or for scholarship assistance. Given the potential of the professional program in implementing public policies (Quelhas and França, 2005), it is extremely important and urgent to implement a support program within higher education institutions (HEIs) for courses that do not have an external subsidy so that they can benefit from them to develop properly.

3.2.2 – Complexity of the teaching work

The daily routing of PMHE teachers was complex, performed in an atmosphere which values research and its developments and multi-functions. The answer to this challenge involves a change in the teacher's posture with a collaborative emphasis. The innovation needed to produce teachers requires permanent investment to create training networks with groups of teachers to support and support the teaching organization (Batista, Vilela, Batista, 2015).

The purpose of this article was to understand the challenges of PMHE from the perspective of teachers and students, using the word cloud technique available in the software application Wordle. It is worth mentioning the use of technological resources in this study is appropriate. The figures corroborated and allowed greater reflection on the previously reported results (Vilela and Batista, 2016), using the thematic analysis of the information produced. However, some limitations need to be underlined when observing the results.

Even assuming the accuracy of the terms shown and their frequencies, this interpretation is limited by Wordle's features. In this application, related words were treated as independent terms, and, above all, the non-treatment of synonyms occurred. This limitation requires a careful review of the words by the researcher so that the processing is done with the greatest use of the words comprising the corpus.

Finally, it is clear that the word clouds portrayed the participants' perceptions, enabling the challenges of the PMHE to be identified, from their appreciation and search for meaning to the highlighted words and their possible connections, by the researchers.

CONCLUSIONS

In this study on postgraduate programs in the professional modality in health education, the word cloud technique created the opportunity to broaden the reflection on the challenges to their realization.

The problems identified were grouped into challenges related to the programs themselves and the institutional ones. Among the former, in addition to better articulating the UHS with the world of work, the need to assume the provocative model of the PM with new possibilities of curricular arrangements stands out – models not dissociated from the UHS project and compatible with the profile of this modality's students. The challenges faced by institutions relate to the structuring of PM support programs and the creation of formative networks for teachers.

In this sense, it is important to look for solutions – thought individually and discussed collectively – to enhance the way people committed to the programs see the programs.

Although with some limitations on how it is configured, the data submitted by Wordle to create word clouds, provided the researchers with the opportunity to enhance how the collected material was seen and, thus, refine the research by combining

methodology and technology. This study contributes to spreading the use of this tool in analysing qualitative data, since the dissemination of this technique is still limited in the health area.

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