ACCEPTABILITY OF THE CTM3 METHOD FOR CONSTRUCTION OF EDUCATIONAL PRODUCTS

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ABSTRACT

The CTM3 Method is a proposal for structuring educational products in the health area, with the aim of facilitating its construction and also making the emitted message more easily absorbed by most people. It is interesting to know the acceptability of the CTM3 Method in the development of educational products by judges with expertise in the subject. Teachers of the Professional Masters in Health Education, from all regions of Brazil, were deliberately chosen to participate as judges. To evaluate the opinions/suggestions issued by the judges, the Thematic Content Analysis was chosen. Among the 13 research participants, 11 (85%) positively analyzed the CTM3 Method. The most evident qualities in the experts' speeches were: 'easy insertion', 'interesting' and 'relevant'. This evaluation strengthens the hope that the CTM3 Method can facilitate the construction and favor the absorption and application of inferred knowledge in educational products.

KEYWORDS: Health education, Communication, Methods, Educational products.

ACEITABILIDADE DO MÉTODO CTM3 PARA CONSTRUÇÃO DE PRODUTOS EDUCACIONAIS

RESUMO

O Método CTM3 é uma proposta para estruturar produtos educacionais, com o objetivo de facilitar a construção desse e ainda tornar a mensagem emitida mais facilmente absorvida para a maioria das pessoas. É interessante conhecer a aceitabilidade do Método CTM3 na elaboração de produtos educacionais por juízes com expertise no assunto. Propositadamente, foram escolhidos os professores de Mestrado Profissional em Ensino na Saúde, de todas as regiões do Brasil, para participar como juízes. Para avaliar as opiniões/sugestões emitidas pelos juízes foi optado pela Análise de Conteúdo Temática. Dentre os 13 participantes da pesquisa, 11 (85%) analisaram positivamente o Método CTM3. As qualidades mais evidenciadas nas falas dos expertises foram: 'fácil inserção', 'interessante' e 'relevante'. Essa avaliação fortalece a premissa de que o Método CTM3 possa facilitar a construção e favorecer a absorção e a aplicação do conhecimento inferido nos produtos educacionais.

PALAVRAS-CHAVE: Educação em saúde, Comunicação, Métodos, Produtos educacionais.

1. INTRODUÇÃO

Since the beginning, society has been in constant search of more effective communication (Severino, 2006). In health teaching, communication is one of the pillars, as it seeks to facilitate understanding of what would be essential for health to be achieved. A very old dream, but also a very current one, of making science understood.

Health education, according to the WHO, presupposes health literacy, encouraging the adoption of healthy living standards, for the individual and collective good, including leading to the judicious and careful use of the health services that are available (Centers for Disease Control, 2021).

Levy *et al*. (1997) add that health education is a link between the population's desires and expectations for a better life and the projections of government officials to offer more efficient health programs.

One of the ways to act with health education is through educational products that, according to Freitas *et al.* (2009), constitutes all educational equipment or technologies used in a teaching process, aiming to encourage and approach the student and/or target audience of the content.

The CTM3 Method, created by Santos (2019a), emerged as a booster in the teaching and learning process, precisely for the development of educational products. This method proposes to reach, through a more comprehensive communication, the five senses, the three Ego States, plus other observed instruments, such as anchors, to provoke more meaningful learning.

Therefore, it is pertinent to discuss the acceptability of the CTM3 Method by judges who are masters of the subject. Professors of Professional Masters in Teaching from all regions of Brazil were selected to participate as judges, as they are specialists in the creation of educational products with an interest in knowing alternatives so that the production of their master's students and yours are more effective.

The objective was to demonstrate the evaluation by specialists of the CTM3 Method if it facilitates the construction of a product, and if it can positively influence the learning about the approached topic, creating one more instrument that collaborates in the promotion of health education.

2. BIBLIOGRAPHIC REVIEW

a. Health education

The importance of health education is highlighted when the US Department of Health & Human Services (HHS), which is the body responsible for updating the Healthy People goals every decade, in the fifth edition of that program, "Healthy People". For the first time since its creation in 1979, it included health literacy in its structure as a comprehensive goal and a fundamental principle for achieving health and well-being (Santana *el al.*, 2021).

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Santana *et al.* (2021) note that health education does not depend only on individual capabilities, but also on the ability of organizations to make health-related information and services accessible and understandable in an equitable way, that is, it is the duty of health communicators, in the public and private spheres, to do so efficiently: clearly, attractively and egalitarian.

Especially in the field of health, not being assertive when communicating can incur illness or even death. Making communication in teaching more encompassing and effective can favor this learning (Santos, 2019a).

b. Educational product

Santana *et al.* (2021) point out that educational products clarify and simplify the terms and procedures of health care, and can make patients more active in caring for themselves and others around them, acting in a preventive way to health, as well as better adhering to the treatment and being more able to deal with pathologies.

The information conveyed in an educational product or a class, in addition to the content, should consider who will receive it. In such educational process, Sanchez & Gaeta (2023) highlight the importance of considering people's personal as well as social dimensions once the development of social competences contributes to interpersonal encounters.

Santos *et al.* (2019b, p. 1083) claim that "it is important to think of teaching as a communication process". It is necessary to know that this person can be more or less receptive to the message, depending on his/her characteristics. However, how to know such individual characteristics? Even if you have a well-defined target audience, such as teenagers, there will be, in this environment, people with different individual characteristics both in terms of personality structure and sensory characteristics. It is, therefore, necessary to somehow address these aspects, so that the message can reach everyone (Santos *et al*, 2019b).

c. The CTM3 Method

Identifying the educational alternatives capable of motivating students to the point of promoting meaningful learning is one of the biggest challenges in Education (Araújo e Roque, 2022). The CTM3 Method, created by Santos (2019a), emerged as a booster in the teaching and learning process, precisely for the development of educational products. This method proposes to reach, through a more comprehensive communication, the five senses, the three Ego States, plus other observed instruments, such as anchors, to provoke more meaningful learning. **Figure 1** have the representation of the CTM3 Method.
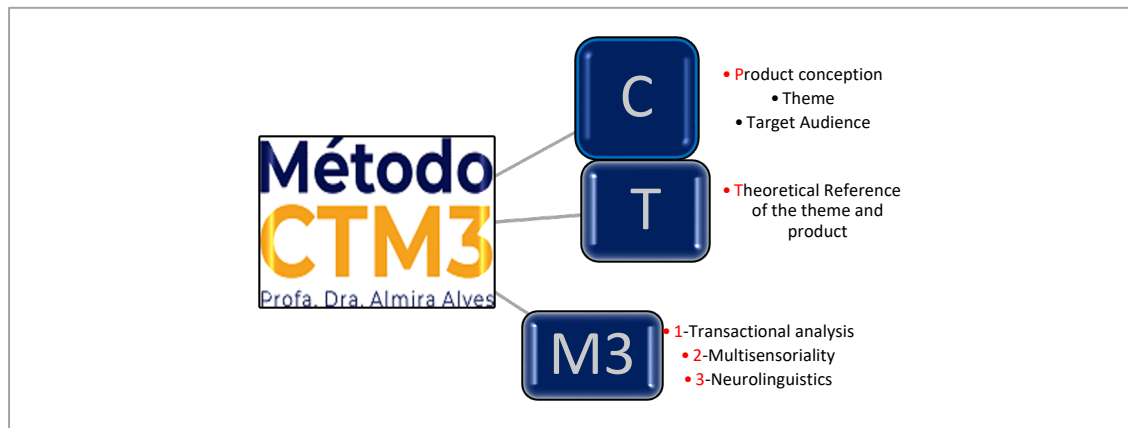
Figure 1: CTM3 method
Source: the author, 2021.

Giving meaning to the name **CTM3**, Santos (2019a) describes:

*Step **C** of **C**TM3*

- Product **C**onception **(C)** – it is the initial planning, in which its fundamentals are established: the choice of topic, what type of educational product and what elements best fit its purpose, and, mainly, what will be the target audience and its characteristics, age range, what are the means of dissemination and what is the feasibility of executing the product..

*Step **T** of C**T**M3*

- **T**heoretical Reference **(T)** – it consists of the basis for the theoretical foundation to be used in the topic and the nature of the chosen educational product.

*Step **M3** of CT**M3***

- **M**ethodological Reference (**M**) – presents the concepts that will be used in the theories to be referenced, guiding the insertion of data to develop them in the product. The CTM3 methodological framework is what distinguishes it and gives it scope, it is structured into three theories; for that reason, there is the numeral that follows the letter M in CTM3:
    1. *Transactional Analysis* **–** is a theory developed by a Canadian psychiatrist, and naturalized American, Eric Berne, who studied and analyzed interactions (verbal and non-verbal transactions) between individuals. In this theory, the personality structure is made up of three elements called Ego States: Parent, Adult, and Child Ego States (Kertész, 1987).
    2. *Neurolinguistics* – for Figueira (2014, p. 17), "Neurolinguistic Programming (NLP) teaches us to become aware that our experience in the world is not the world and that our perception is influenced by filters, such as beliefs and values". Therefore, when communicating, we do not use only spoken or written words, but an arsenal of tools, sometimes correlated to our feelings and memories as anchors.
    Anchors constitute, then, any element that gives access to an emotional state, or a memory. Every time the individual comes into contact with the anchor, he will be,

consciously or unconsciously, resuming the original message, reinforcing it (O'connor & Seymour, 1995).

3. *Multisensoriality* - The senses are the channels through which information is captured and, even if sight and hearing are the most used, Lindstrom (2012) asserts that, when communication manages to access the five senses, there is a greater receptive potential, since 80% of the established impressions are non-verbal. Therefore, the search must be for the exploration of all senses (sight, hearing, touch, smell, and taste) with the purpose of "persuading" people in a more complete and interactive way (Fujisawa, 2006).

3. METHODOLOGY

To evaluate the acceptability of the CTM3 Method, a group of specialists was formed, consisting of Brazilian professors, invited to participate in this study. The criterion for selecting the experts was belonging to the faculty of one of the professional master's programs in health education. Initially, to contact the professors, a search was carried out on the website of the Coordination for the Improvement of Higher Education Personnel (CAPES), which is a foundation linked to the Ministry of Education of Brazil. In master's programs, it was possible to locate the electronic address on the HEI websites, in the tab referring to the faculty; when this contact was not available, the curriculum lattes were accessed to obtain this information. Then, 98 letters of invitation were sent by e-mail to the professors of the respective programs, with information about the objectives and description of the study, as well as the rights of professors as participants. The study followed these steps:

1- Sending the invitation to the judges, ICF and theoretical collection on the CTM3 Method:

Faced with the request for participation, formalized by an invitation letter sent by email, the judges were instructed about the objectives of the study and then offered, analyzed, and signed the Free and Informed Consent Form – ICF. Thus, only after acceptance, the judges received the theoretical collection on the CTM3 Method in the form of a book chapter, in which there were links to structured educational products with this method.

2- Acceptance of the CTM3 Method:

A form (*Google forms*) was made available for each specialist to indicate their judgment and, in the end, point out their answer, with space for opinions with suggestions or recommendations, pointing out the strengths and weaknesses of the method, or other observations.

To quantify the acceptability of the CTM3 Method, it should be noted that, for some scholars, the assessment by a committee of specialists adopting the 75% index as the minimum level of consensus in the final stage of the Delphi technique (Wright & Giovinazzo, 2000). However,

other scientists describe content evaluation as a judgment process, consisting of two distinct parts. Thus, considering the opinions/suggestions given by the judges to assess the content validity, it is also recommended to use qualitative procedures. For that, in the present study, thematic content analysis was chosen, which emphasizes the identification, analysis, and interpretation of meaning patterns (or "topics") within qualitative data (Braun & Clarke, 2006).

The same authors, Braun and Clarke (2006) explain that a topic points to something important about the data about the research question and represents some level of standardized answer or meaning within the dataset. Thus, the researcher's gaze is essential to determine the topic and, since this is a qualitative analysis, there is no significant importance to the question of how many times your dataset needs to display evidence of the topic for it to be considered a topic, the more important would be the meaning of those data for your research. Braun and Clarke (2006) suggest that thematic analysis of data follows a sequence of six phases (**Figure 2**):

- Phase 1: involves 'repeated reading' of data, looking for meanings, and patterns.
- Phase 2: the codification process, in which the researcher organizes his data in meaningful groups (semantic or latent content). Coded data differ from units of analysis (subjects) which are (often) broader. The topics, which start to be developed in the next phase, are where the interpretive analysis of the data takes place, and about which arguments are made about the phenomenon being examined.
- Phase 3: Consider how different codes might combine to form an overarching topic. It may be helpful at this stage to use visual representations (tables or mind maps) to classify the different codes into topics, such as tables or mind maps.
- Phase 4: a review of the topics, with two clear purposes: to verify that all the grouped extracts appear to form a coherent pattern and to code any additional data that may have been missed in earlier stages of coding.
- Phase 5: further defining and refining topics mean identifying the "essence" of what each topic is about and determining what aspect of the data each topic captures. At this stage, observe if there are sub-topics.
- Phase 6: production of the report that needs to be embedded in a compelling analytical narrative that illustrates the story about the data and arguments with the research question.
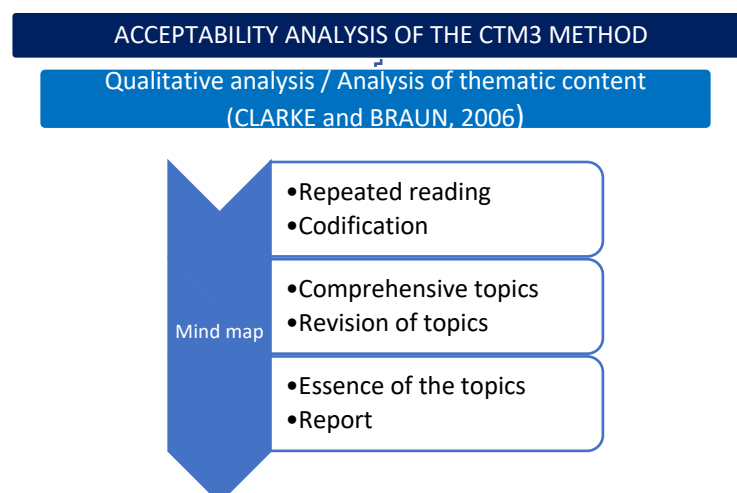
ACCEPTABILITY ANALYSIS OF THE CTM3 METHOD

Qualitative analysis / Analysis of thematic content
(CLARKE and BRAUN, 2006)

Mind map

- Repeated reading
- Codification

- Comprehensive topics
- Revision of topics

- Essence of the topics
- Report

Figure 2: Phases of the analysis

4. RESULTS AND DISCUSSIONS

98 invitation letters were sent by e-mail to the professors (doctors/professors of the Professional Master's Degree in Health Education), with information about the objectives and description of this study, as well as their rights as participants. Of the total number sent, 20 professors responded positively to the intention of collaborating with this research, forwarding the ICF to this group, which was signed and returned, confirming participation in the Delphi Conference. Still, 13 expert judges answered and sent the questionnaire within the established deadline. These abstentions are within the expected limits for the method, which usually achieves 20% to 30% of response to the invitation (Wright & Giovinazzo, 2000). The participants totaled 13 PhD professors in the Professional Master's Degree in Health Education, among which two had a postdoctoral degree. It should be noted that the research had representatives from all regions of Brazil shown in **Figure 3**:
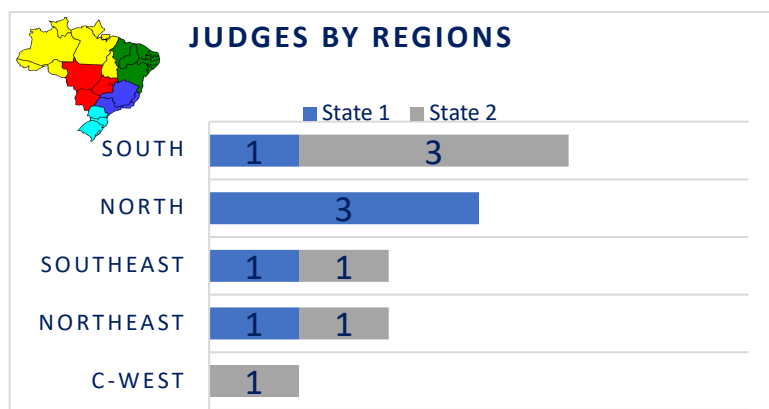

Figure 3: **Participating judges by region and state**

During the CTM3 Method acceptability process, 8 of the 13 judges left comments and suggestions, 6 of them highlighting the positive characteristics of the CTM3 Method, as shown in the excerpts:

A systematic and creative method is proposed for the creation process of educational products so that the product has a degree of novelty, applicability, and problem-solving generated from research activity. It is very easy and pleasant reading the chapter on the CTM3 Method. (Judge 1)

The CTM3 Method allows for the proper insertion of the items necessary for the product's elaboration, based on the three stages that compose it. (Judge 5)

The CTM3 Method is a relevant contribution to the development of technical-technological products in the area of health education. I highlight the good foundation of the method, which goes through stages such as product conception (1); The

theoretical framework (2), and, about it, the last step, the methodological framework (3). I emphasize the importance of good articulation of the referred steps, as well as the inclusion in the elaboration of the product of communicative elements such as Transactional Analysis; Multisensorial Application, and the elements of Neurolinguistics. Therefore, I highlight the relevance of the method and confirm the validation of the CTM Method 3. (Judge 11)

This is an interesting method that allows you to systematize educational products to achieve your objectives more pragmatically. Health communication needs studies and constant improvement so that the message that one wants to transmit to a certain public is understood. Thus, the CTM3 Method guides the production of materials, directing toward elements that must be present. (Judge 12)

The method presents a foundation with coherent and relevant concepts for the elaboration and validation of educational products aimed at health promotion. As presented in the material sent for reading, it still shows potential for an interesting and possible method to also favor communication in the teaching and learning processes. (Judge 13)

Some of the judges' suggestions were made, such as the creation of a facilitating instrument to introduce the items to be observed in the elaboration of a product that will use the CTM3 Method:

As a suggestion, I bring the possibility of creating an instrument (which perhaps already exists) for the guidance/monitoring of the application of the method in the elaboration and evaluation of educational products elaborated based on it. The instrument could contain all the elements that contain the three steps of the method, objectively assisting in its application. (Judge 13)

I suggest including schematic images, especially regarding the egos, to facilitate understanding. (Judge 6)

Two other judges did not conclude the evaluation of the method, presenting the following justifications:

During the reading of the indicated chapter, no elements were identified that would indicate sufficient evidence to consider the CTM3 Method validated. (Judge 5)

The chapter you indicate is powerful and thought-provoking, but I work with other theories concerning subjectivity. (Judge 7)

Qualitative analysis of collected data for acceptability

Using the thematic data analysis guide created by Braun and Clarke (2006), the following results were obtained:

- Phase 1: 'repeated reading' of the data is performed, looking for meanings and patterns.

- Phase 2: in the codification process, the topics began to be developed after interpretive data analysis.
- Phase 3: 3 topics emerged named 'positive' (because they were favorable to CTM3), 'negative', and 'suggestions' and 13 sub-topics (**Figure 4**).
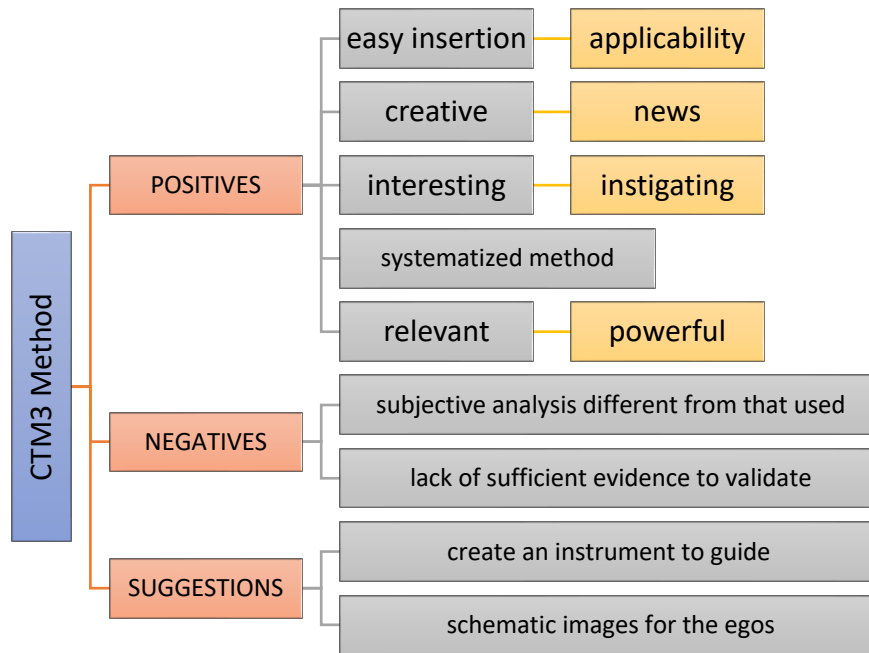
Figure 4: Phase 3 mind map with 3 topics and 13 sub-topics

- Phase 4: When verifying the similarity between some subtopics, it was decided to group the extracts that seemed to form a coherent pattern, as an example: 'easy insertion' and 'applicability'; 'interesting' and 'instigating, 'creative', 'new'; 'relevant' and 'powerful'. The two sub-topics related to the topic 'suggestion' were grouped into 'create an instrument with schematic images' (**Figure 4**).
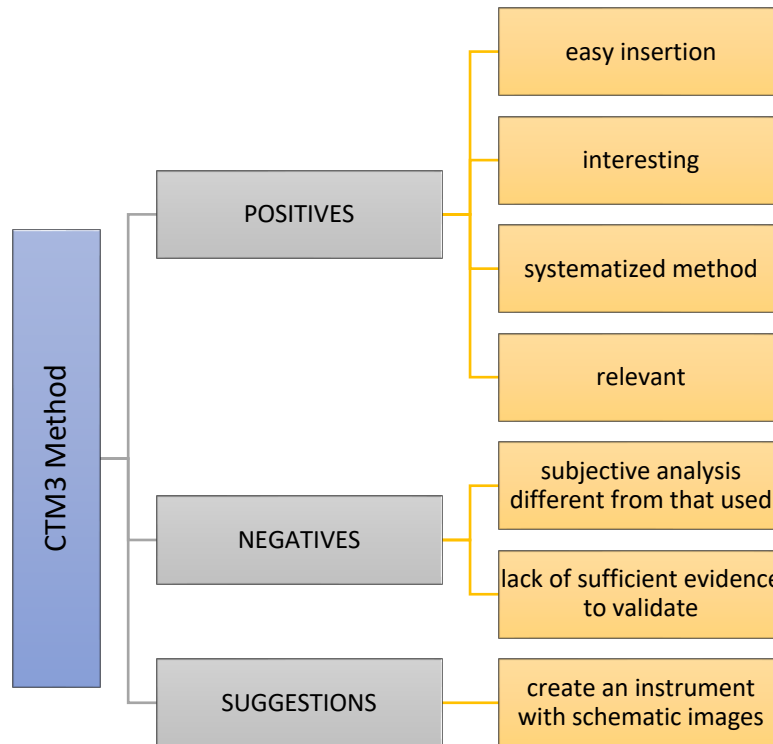
Figure 5: **Phase 4 mind map with 3 topics and 7 sub-topics**

- Phase 5: When trying to identify the essence and determine which aspect of each topic was captured, the need to rename them was felt. The topics previously called 'positive' were now classified into 'qualities', which were pointed out by most judges and were appropriately grouped by similarity. The topics previously called 'negatives' and 'suggestions' were grouped into 'individual speeches', it is explained: it was noticed that this new denomination is more realistic and inappropriate of judgments, as could be implied by the denominations 'positive and negative' (**Figure 6**). The 'individual lines', despite coming from the minority, could never be excluded; this is an advantage of qualitative analyses.
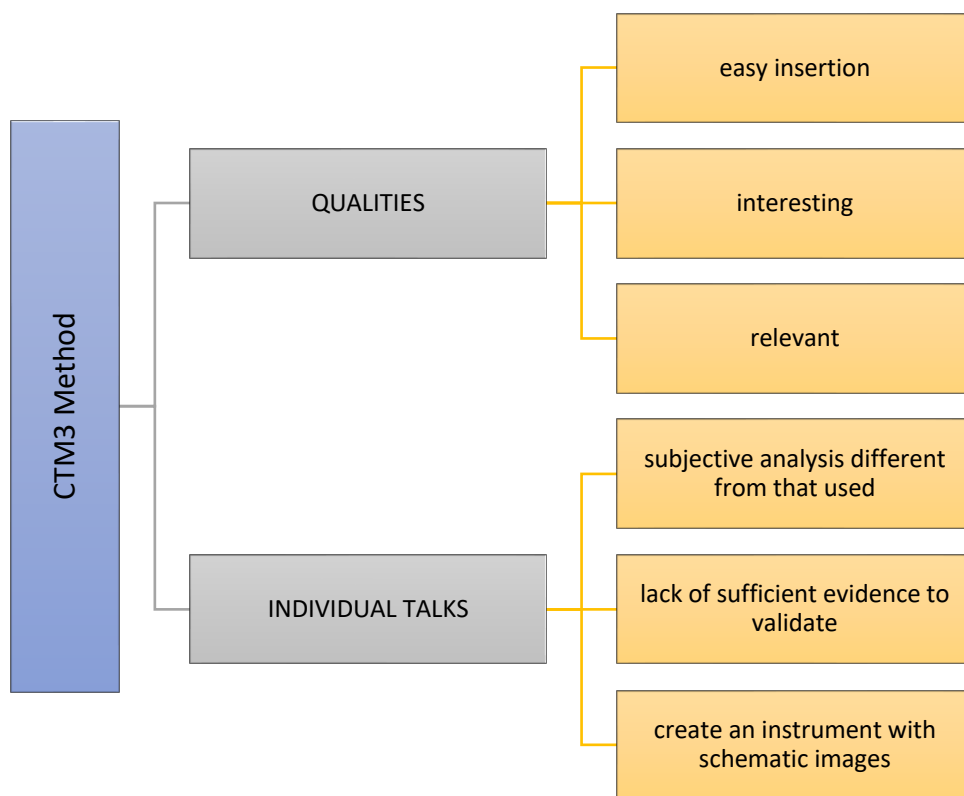
Figure 6: **Phase 5 mind map with 2 topics and 7 sub-topics**

After the feedback for the author of the CTM3 Method was presented, Santos was favorable and accepted one of the suggestions, creating an instrument with schematic and editable images, creating the possibility of inserting data (**Figure 7**).
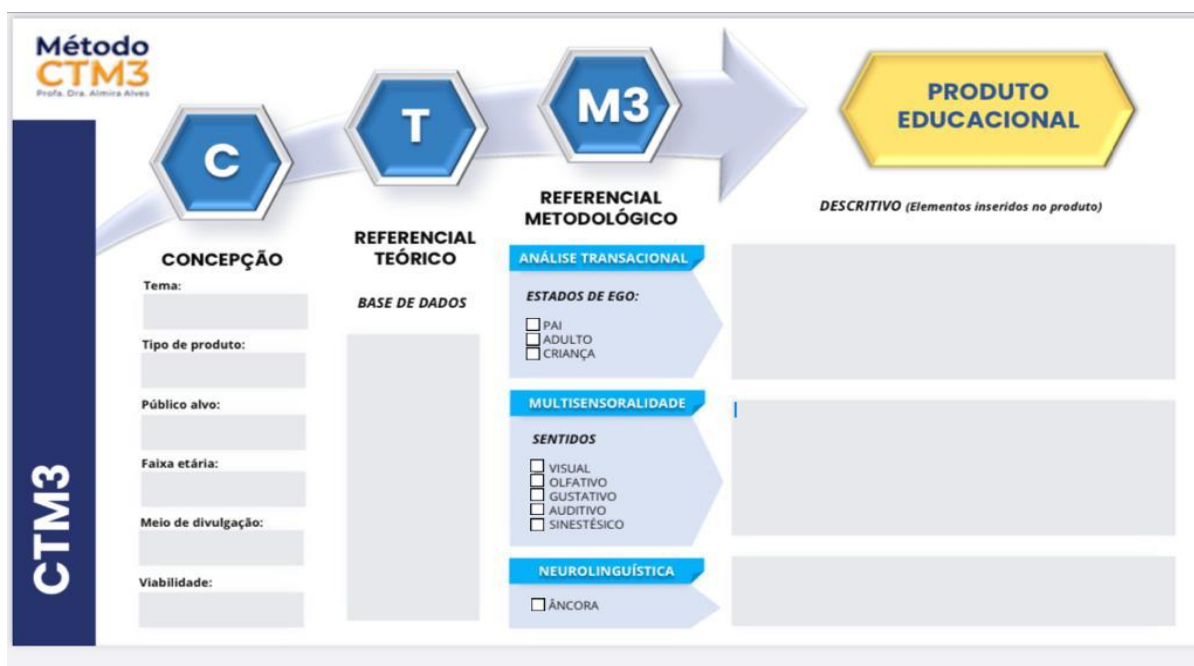

Figure 7: Editable schematic of the CTM3 Method. Source: Educapes website.
Available at: https://educapes.capes.gov.br/handle/capes/720507. Accessed on: 02/10/2023

When evaluated by expert judges, the CTM3 Method obtained an acceptability rate of 84.6%, indicating that it may be able to produce important results. Such results, at first agreeing with the proposal of the CTM3 Method as being another instrument in this incessant search for quality learning, starting from the point of being a way to make the elaboration of educational products more comprehensive and attractive, because they involve all states of Ego and sensoriality, besides using anchors, assumptions of this Method.

Bacha and Santos (2021) have made an educational video: 'HPV: concept and prevention' structured in the CTM3 Method and when comparing the knowledge about HPV of medical students before and after watching this video, the average of correct answers obtained a score gain of 92.5%, reflecting a great learning experience ($p < 0.0001$). They concluded that the CTM3 Method managed to make a positive contribution to the construction and effectiveness of this educational product.

Santos *et al.* (2014) carried out an experimental study to evaluate the effectiveness of an educational toy as a teaching-learning strategy in children aged 6 to 12 years in a public school in Alagoas (Brazil), emphasizing changes in hygiene-related habits. The OSCE was used before and after using an educational resource consisting of a doll with a booklet in its backpack containing information on how and when to wash hands. Items such as multisensoriality, the three ego states, and the anchor (the doll itself) were present in this educational product. Regarding hand washing at meals, of the 62 subjects evaluated, 12.90% washed their hands before applying the educational tool and 93.55% after applying the educational tool; 9.68% washed their hands after using the bathroom before applying the tool and 85.48% after its application.

Specifically on multisensoriality, Santos *et al.* (2016), in a study, held weekly workshops with seniors stimulating the five senses and realized that, in addition to improving the learning process, working with the sensory senses is a strategy to stimulate memory, because it provides memories and vivid memories and contributes to the capacity for reasoning, attention, and perception.

The professional master's degree "[…] aims at training for transforming professional practice with a focus on the management, production or application of knowledge, aiming at solving problems or proposing innovations […]" (CAPES, 2019). Concomitant with the growing number of professional master's degrees in Brazil, there is an increase in the development of educational products. As the CTM3 Method was initially created, in the words of the author herself (SANTOS, 2019c), to help in the manufacture of more effective educational products, it is clear that its use may be increasingly common

Some educational resources structured in the CTM3 Method have already been evaluated, in addition to the video of this study. Rocha (2019), Soares (2019), Toledo (2019), Carvalho Filho (2021), Medeiros (2021), Meneses (2021), and Warren (2021) had educational resources structured in the CTM3 Method in their dissertations that were evaluated, and validated by various means, including the master's board.

However, as Polit and Beck (2011) remind us, validation is an almost never-ending process, in other words, the more evidence that can be gathered that the instrument is having the proposed result, the greater the confidence that researchers will have in its validity.

5. CONCLUSION

The CTM3 Method was well accepted by the evaluators participating in this study, emphasizing its relevance and ease of application, it is expected that it favors the absorption and application of the inferred knowledge in the elaboration of educational products. A method that intends to strengthen the teaching and learning relationship in health, with the proposal of wider communication between people and a better apprehension of the content offered, should be better studied.

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